



# *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.



Statistics  
Canada

Statistique  
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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 SPSD/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 SPSD file ( <code>.spd</code> )
<code>fmxopen</code>	Routines for reading SHS ( <code>.fxv</code> ) file
<code>adj</code>	Perform SPSD 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.

call                      Call tax/transfer calculator

drv                      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

cceopt                      Multiple calls of tax/transfer calculator

### **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.

`oas`                      Compute OAS 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.

`gis`                      Compute GIS/SPA for elderly

### **1.3.5.3 Provincial GIS Supplementation Programs**

The `gist` function calculates benefits for provincial GIS supplementation programs in Newfoundland and Labrador, Nova Scotia, New Brunswick, 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 txceea 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.

txceea                      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 consumable 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

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## 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 and to adjust the months of education for students aged 16 to 18. 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 a certain calendar year. Adjustment of this data may be required for several reasons.

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. Two such specific database adjustments are currently available in black box mode: an adjustment of RRSP contributions and an adjustment of months of education.

The RRSP contribution 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 a 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 RRSPEMIN and RRSPEMAX, their RRSP contributions will be increased by RRSPEINC.

The educational adjustment is designed to replace the values for months in school for post-secondary students under the age of 19. When EDUCADJFLAG is turned on, an adjustment is made to the months of education (ideducfm and ideducpm) for students in post-secondary school aged 16 to 18. As few of these people file income taxes, their months of education would otherwise be under-reported. The months of education for these students is drawn from the EDUCMPQ and EDUCMROC distributions when EDUCADJFLAG is turned on.

### 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
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#### INPUT PARAMETERS:

EDUCADJFLAG	Adjust education months activation flag
EDUCMPQ	Distribution of months in school by age for Quebec
EDUCMROC	Distribution of months in school by age for provinces other than Quebec
PROVMAP	Provincial remapping [prov]
RRSPEINC	Increment to rrsp if conditions & rpp>0
RRSPEMAX	Maximum (rpp+rrsp) for increment if rpp>0
RRSPEMIN	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
idage	Age
idestat	Educational status
idrand	Random numbers [array]
idrpp	Registered pension plan contributions (207)
idschtp	School type

#### OUTPUT VARIABLES:

hdprov	Province
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idrrsp	RRSP calculated amount (208)

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<b>call</b>	Call tax/transfer calculator
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## 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.cpp.

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<b>cceopt</b>	Multiple calls of tax/transfer calculator
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## SUMMARY

The cceopt 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 cceopt function controls such recalculations. Each case is discussed under separate headings below:

#### *Pre-calculation of various variables*

The tax and transfer system in the SPSM is run in a specified order (drv). In some cases, a variable is required which hasn't yet been calculated. For example, 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. cceopt 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 family's child tax benefit may differ from the preliminary estimate used for this calculation of Employment Insurance. This is done for other programs, as needed.

#### *Splitting of pension income*

Beginning in 2007, pension income was allowed to be split between spouses in order to lower the tax burden of the family.

### ***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 cceopt 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.

### **SPSM Implementation**

cceopt performs the re-calculations and optimizations in a specific sequence. The pre-calculation of the programs for the calculation of other programs (such as pre0calculating the federal Child Tax Benefit in order to model Employment Insurance) is performed first. Next, the optimization of pension income splitting is done. Finally, the optimization of the child care expense deduction and the federal Child Tax Benefit is performed. The SPSM implementation of each type of optimization are described separately below:

#### ***Pre-calculation of various variables.***

The first time drv is called, certain variables in the code will have a zero value. If necessary, the tax system will be called a second time in order to populate these values.

For example, 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 cceopt 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.

#### ***Splitting of pension income***

The tax system is first run without splitting pension income. When SPLTPNSFLAG or QSPLTPNSFLAG is turned on, pension income can be split between spouses. drv will be called multiple times in order to find the optimal split of pension income. Please see SPLTPNSFLAG for more details about this implementation.

### ***Optimization of the Child Tax Credit/Child Tax Benefit***

The default calculation first performed in txccca makes use of any child care expenses associated with the children in the family. In the cceopt 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.

## CROSS REFERENCE

### Function                      Description

#### INPUT PARAMETERS:

CCEZOPT	CCE young kid optimization rules [1=use, 2=zero, 3=optimize]
PENSPLTINCR	Increment by which to split pension income
QPENSPLTINCR	Quebec increment by which to split pension income
QSPLTPNSFLAG	Quebec flag to split pension income
SPLTPNSFLAG	Flag to split pension income
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
idipens	Pension income (115)
idspoflg	Person has spouse
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:

imbcss	British Columbia Seniors Supplement
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imcceni	Consumable income with CCE not zeroed
imccez	Is CCE zeroed?
imccezi	Consumable income with CCE zeroed
imfcben	Total Federal Child Benefits
imfcbene	Total Federal Child Benefit Supplement
imicnet	Net Income (line 236)
imigis	GIS benefits
iminet	Net income
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
impnsph	Pension income split for head
impnsp	Pension income split for spouse
imqpnsp	Quebec pension income split for head
imqpnsp	Quebec pension income split for spouse
imscb	Saskatchewan Child Benefit
imuccb	Universal Child Care Benefit amount

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**classu**                      Compute user-defined reporting variables

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## 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.

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**ctmod**                      Compute commodity taxes for individuals and households

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## 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, goods and services tax, gasoline excise tax, and air transportation tax. 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 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 four tax types: custom import duties; excise duties; goods and services tax; and excise taxes. 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 SHS 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 ctmmod function, two modifications of the SHS data have been performed by the SPSM.

The first is made necessary because of the way SNA and SHS 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 SHS 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 SHS. Two other SHS 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 SHS values to the levels of other sources. We provide users with factors to inflate expenditures to known 2005 levels.

### *Estimation of commodity taxes*

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

The SHS 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. Provincial taxes applied are defined in the following input parameters:

- CTPAMU Provincial amusement tax
- CTPGAS Provincial gasoline tax
- 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 SHS spending unit via personal income shares in the ctmmod function. The income of the household's head is derived by adding three variables from the SHS income concept not surveyed elsewhere to his/her SPSPD

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 SHS 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 SHS 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 Labour and Income Dynamics (SLID) data using Department of Revenue Greenbook 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 SHS data suffers from the same under-coverage as the SLID so the reported spending unit expenditure can be out of synch with the Greenbook 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 SHS spending unit income by the ratio of the SPSD "shared" income concept to an equivalent SHS "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 SHS. Generally, SNA includes the entire personal sector whose components are households, self-employed professionals, and universities. SHS 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 SHS income concept (CTOPT=1) are almost negligible. Using 1984 base case parameters the SHS option produced a \$20.997 billion tax burden on Canadian families while the scaled option generated \$21.048 billion. These compare favourably with the SNA estimate of \$22.5 billion. However, the differences for the highest income households are greater. 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 SHS 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	SHS->SNA conceptual conversion factor [com]
CTCAPTOBFLG	Flag to cap tobacco expenditures
CTFCID	Federal custom import duties [com]
CTFEXD	Federal excise duties [com]
CTFEXT	Federal excise taxes [com]
CTFGST	Federal GST [com]
CTFGSTHOUSE	Gst on housing to be allocated [prov][tenure]
CTFLAG	Commodity tax activation flag
CTFNEW	New federal commodity tax [com]
CTLPROP	Local property taxes
CTNES	Expenditures NES
CTOPT	Commodity tax calculation method [1=SHS,2=SPSM]
CTPAMU	Provincial amusement tax [prov]
CTPCAR	Provincial carbon tax [com x prov]
CTPGAS	Provincial gasoline tax [com x prov]
CTPLGL	Provincial liquor gallonage tax [prov]
CTPNEW	New provincial commodity tax [com x prov]
CTPPLQ	Provincial profits on liquor commissions [prov]
CTPRST	Provincial retail sales tax [com x prov]
CTPTOB	Provincial tobacco tax [prov]
CTSAVE	All positive savings
CTTOBMAX	Maximum value of tobacco expenditures

#### INPUT VARIABLES:

ctnexp	Household expenditure net of taxes
ctothmon	Household money from other sources
cttxfc	Federal commodity taxes (total)
cttxpc	Provincial commodity taxes (total)
fxalimo	Alimony and child support
fxanncon	Annuity contracts and transfers to RRIFs
fxfomr	Other money receipts
fxgstidx	Index for distributing GST on housing
fxgvpen	Gvt pension plan contributions
fxhomexp	Expenses assoc with principal residence

fxio	I/O expenditure categories [array]
fxnes	Not elsewhere stated
fxnsave	Negative savings
fxprtax	Property tax
fxpsave	Positive savings
fxpvpen	Private pension plan contributions
fxrepr	Repairs paid
fxsaldur	Sale of durables
fxseqhv	SHS record sequence number
fxtptax	Transfer of Property taxes
hdprov	Province
hdtenur	Tenure
hhnin	Number of individuals in household
idhhrh	Relationship to head of household
iditrrsp	Taxable RRSP withdrawals
immdisp	Disposable income

#### OUTPUT VARIABLES:

ctfcid	Federal custom import duties
ctfcid_	Federal custom import duties [array]
ctfexd	Federal excise duties
ctfexd_	Federal excise duties [array]
ctfext	Federal excise taxes
ctfext_	Federal excise taxes [array]
ctfgst	Federal GST
ctfgst_	Federal GST [array]
ctfgsths	Federal GST on housing
ctfnew	New federal commodity tax
ctfnew_	New federal commodity tax [array]
ctishrh	Shared income concept (SHS)
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]
ctnsna	Household expenditure net of taxes -SNA adjusted
ctnsna_	Household expenditure net of taxes [array] -SNA
adjusted	
ctothmon	Household money from other sources
ctpamu	Provincial amusement tax
ctpcar	Provincial carbon tax
ctpcar_	Provincial carbon tax [array]
ctpgas	Provincial gasoline tax
ctpgas_	Provincial gasoline tax [array]
ctplgl	Provincial liquor gallonage taxes
ctpnew	New provincial commodity tax
ctpnew_	New provincial commodity tax [array]
ctpplq	Provincial profits on liquor commissions

ctprov	Province for COMTAX calculations
ctprst	Provincial retail sales tax
ctprst_	Provincial retail sales tax [array]
ctptob	Provincial tobacco tax
ctsave	Household savings
ctseqhv	SHS 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 (SHS & SPSD)
imtxfc	Federal commodity taxes
imtxpc	Provincial commodity taxes

<b>dem</b>	Compute new taxable demogrants
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## 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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## 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
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
txfstc	Compute federal sales tax credit
txprov	Compute provincial taxes and credits
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	Multiple calls of tax/transfer calculator
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.
- 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.
- cceopt optimizes income by maximizing the child care expense credit and the child tax credit, optimizes pension income splitting, and pre-calculates variables.
- 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 txcea 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 cceopt all the functions are called multiple times by drv.

ui		Compute UI benefits
	<b><i>uiclm</i></b>	Simulate a UI claim
	<b><i>uielent</i></b>	Test UI eligibility: entrance requirements
	<b><i>uielrge</i></b>	Test UI eligibility: regional rules
	<b><i>uiwkbas</i></b>	UI weeks of benefits: basic entitlement

		<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>uiwkbass</i>	UI weeks of benefits: basic entitlement
		<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
	txccea		Compute child care expense allowance
gis			Compute GIS/SPA for elderly
	<i>gissub</i>		Compute income used to tax back GIS/SPA
gist			Compute Provincial GIS top-ups for elderly
	txhhexp		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
txctc			Compute child tax credit
txfstc			Compute federal sales tax credit
txprov			Compute provincial taxes
	txnfld		Compute Newfoundland provincial taxes
	txpei		Compute PEI provincial taxes
	txns		Compute Nova Scotia provincial taxes
	txnb		Compute New Brunswick provincial taxes
	txque		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.
gai		gai	Stub routine for new post-tax system programs
memo1			Compute memo items for reporting
ctmod			Compute commodity taxes
	ctfx		Compute commodity taxes for SHS spending unit
		ctfxd	Compute commodity taxes for SHS spending unit (detailed)
memo2			Compute consumable income, etc.
cceopt			Multiple calls of tax/transfer calculator recalculate programs
	pass2		
		drv	Conditional execution of the Tax/Transfer Calculator
	...		Repeat if necessary for optimizing
classu			Compute User Defined Reporting Variables

---

## **famod**                      Compute family allowance

### **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 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 (imtfa) and number of family allowance children (imnfach).

## 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
QFFSL	Federal family allowance: Quebec
Configuration[parity,\$]	
QFPFL	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
QNBFLFLAG	Quebec newborn family random increase of child rank
STDFA	Standard federal family allowance per child
TARGETYEAR	Year of analysis
UCCBAMT	Universal child care benefit amount for each child < 6
UCCBFLAG	Universal child care benefit activation flag

#### 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]
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  
impfa          Provincial family allowance  
imqaafa        Quebec Availability Allowance FA Supplement  
imqnbfa        Quebec newborn Allowance  
imqtfa         Quebec taxable family allowances  
imtfa          Taxable family allowances  
imuccb         Universal Child Care Benefit amount  
nfineld        Eldest person in nuclear family [pointer]  
nfinspo        Spouse of eldest [pointer]

**fmfxopen**       Routines for reading SHS (.fxv) file

---

## SUMMARY

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

## CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

CTCFALC	SHS reporting error adjustment: Alcohol [prov]
CTCFGAS	SHS reporting error adjustment: Gasoline [prov]
CTCFTOB	SHS reporting error adjustment: Tobacco [prov]
CTTXRM	Base year commodity tax removal factor [com x prov]
EXPADJ	Adjustment Factor: All expenditure adjustment
GFALIMO	Adjustment Factor: Alimony and child support
GFANNCON	Adjustment Factor: Annuity contracts and transfers to RRIFs
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
GFGSTIDX	Adjustment Factor: GST on housing index [province][tenure]
GFGVPEN	Adjustment Factor: Government pension plan contributions
GFHOMEXP	Adjustment Factor: Expenses associated with princ residence
GFINTAX	Adjustment Factor: Income taxes
GFIPAC	Adjustment Factor: Life insurance premiums and annuity contributions
GFNCALN	Adjustment Factor: Negative change in assets and liabilities
GFNCALP	Adjustment Factor: Positive change in assets and liabilities
GFNES	Adjustment Factor: Not elsewhere stated
GFPRTAX	Adjustment Factor: Property tax
GFPURPRC	Adjustment Factor: Purchase price of home
GFPVPEN	Adjustment Factor: Private pension plan contributions
GFRECOM	Adjustment Factor: Real estate commissions
GFREPR	Adjustment Factor: Repairs paid
GFRFEES	Adjustment Factor: Registration and license fees
GFRRSPT	Adjustment Factor: Total RRSP contributions (SHS)
GFSELPRC	Adjustment Factor: Selling price of home
GFTPTAX	Adjustment Factor: Transfer of property taxes
GFUIC	Adjustment Factor: UI contributions
KEEPNEGEXP	Retain negative expenditures in SHS
DBVERSION	Version of the database (x100)
INPF XV	Name of SHS vector file (in) [string]
INPSPD	Name of SPSD file (in) [string]

#### INPUT VARIABLES:

fhhbver	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
fralimo	Alimony, separation allowance, child support payments
franncon	Annuity contracts and transfers to RRIFs
frclohhv	Cloning factor for SHS exp. vector
frclshs	SHS cloning factor
frcpp	Cpp - qpp contributions
frfabd	Account balancing difference
frfomr	Other money receipts
frgstidx	Index for distributing GST on housing
frgvpen	Gvt pension plan contributions

frhomexp	Expenses associated with operation of principal residence
frintax	Income taxes
frio	Expenditure on the 40 I/O categories [array]
fripac	Life ins prems and annuity contributions
frncal	Net change in assets and liabilities
frnes	Not elsewhere stated
frprtax	Property tax
frpurprc	Purchase price of home
frpvpen	Private pension plan contributions
frrecom	Real estate commissions
frrepr	Repairs paid
frrfees	Registration and license fees
frrrspt	Total RRSP contributions (SHS)
frselprc	Selling price of home
ftrptax	Transfer of Property taxes
fruic	UI contributions
hdprov	Province
hdtenur	Tenure

#### OUTPUT VARIABLES:

fhhash	Hashed code of header information
fxalimo	Alimony and child support
fxanncon	Annuity contracts and transfers to RRIFs
fxclohhv	SHS cloning factor
fxcloshs	SHS cloning factor
fxcqp	Cqp - qqp contributions
fxfabd	Account balancing difference
fxfomr	Other money receipts
fxgstidx	Index for distributing GST on housing
fxgvpen	Gvt pension plan contributions
fxhomexp	Expenses assoc with principal residence
fxintax	Income taxes
fxio	I/O expenditure categories [array]
fxipac	Life ins prems and annuity contributions
fxncal	Net change in assets and liabilities
fxnes	Not elsewhere stated
fxnsave	Negative savings
fxprtax	Property tax
fxpsave	Positive savings
fxpurprc	Purchase price of home
fxpvpen	Private pension plan contributions
fxrecom	Real estate commissions
fxrepr	Repairs paid
fxrfees	Registration and license fees
fxrrspt	Total RRSP contributions (SHS)
fxsaldur	Sale of durables

fxselprc	Selling price of home
fxseqhv	SHS record sequence number
fxtptax	Transfer of Property taxes
fxuic	UI contributions
hdfrstfx	First household in SHS group flag
hdlastfx	Last household in SHS group flag
hdwgtfx	Sum of household weight for SHS group

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## **fmspopen**      Routines to read SPSD file (.spd)

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### **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**

<b>Function</b>	<b>Description</b>
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
GFC CETT	Growth Factor: Child care expenses (Limit A, Form T778)
GFCGTC	Growth Factor: Caregivers tax credit (315)
GFC HART	Growth Factor: Charitable donations (340)
GFC LERGY	Growth Factor: Clergy residential deduction
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
GFCPPL65	Growth Factor: CPP for age < 65
GFDALIMO	Growth Factor: Alimony paid (220)
GFDISOTH (318)	Growth Factor: Disability amount for dependants
GFDISSLF	Growth Factor: Disability amount for self (316)
GFDUES	Growth Factor: Union and professional dues (212)
GFEMPLO (248)	Growth Factor: Employee home relocation loan dedn
GFEXPLOR expenses (224)	Growth Factor: Exploration and development
GFFORINC	Growth Factor: Net foreign income (508)
GFFORTX	Growth Factor: Foreign tax paid (507)
GFGIFTS (342)	Growth Factor: Gifts to Canada/provinces/culture
GFGSTREB	Growth Factor: GST rebate (457)
GFHOMSTU homeowner assistance (558)	Growth Factor: College residence/resident
GFIALIMO	Growth Factor: Alimony Income
GFICAPG	Growth Factor: Capital gains (actual) (127 * 1.5)
GFIDIV 1.5)	Growth Factor: Dividend income (actual) (120 /
GFIEMP	Growth Factor: Employment income [province,sex]
GFIINVND dividend)	Growth Factor: Investment income (excluding
GFILLOSS	Growth Factor: Business investment losses (217)
GFINTSTU (319)	Growth Factor: Interest paid on student loans
GFIPENS	Growth Factor: Pension income (115)
GFISA	Growth Factor: Social assistance income
GFISE	Growth Factor: Self-employment income
GFITC (412)	Growth Factor: Federal investment tax credits
GFITOTH (taxable)	Growth Factor: Other non-government income
GFITRRSP	Growth Factor: Taxable RRSP withdrawals
GFIWORKC	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)
GFSAPRED	Growth Factor: Predicted benefits from Social
Assistance	
GFSTKDED	Growth Factor: Stock option deduction (249)
GFTUITN	Growth Factor: Tuition fees (320)
GFUIPRED	Growth Factor: Predicted benefits from UI
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]
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 SHS expenditure vector file
INSPSD	Name of SPSPD file (in) [string]
WGTFLAG	Read weight file

#### INPUT VARIABLES:

fhbfver	SPSPD/M binary format version (x100)
fhdbver	SPSPD/M database/year version (x100)
fhfiltyp	File type (extension) [string]
fhnhh	Number of households in the file

hrclohh	Number of SLID clones
hrevmv	Expenditure vector matching variable
hrprov	Province
hrtenur	Tenure
hrurb	Size of urban area
idage	Age
idccqp	Converted CPP/QPP benefit
idcsa	Converted social assistance
idsex	Sex
irage	Age
iralhrs	Total Hours Worked Last Year
irccqp	Converted CPP/CQP
ircfrh	Relation to census family head
ircfseq	Census family sub-sequence number
ircsa	Converted social assistance
ircuib	Converted UI benefit
irdisab	Disability status (age 16+)
iredlev	Educational level
irefrh	Relation to economic family head
irefseq	Economic family sub-sequence number
irestat	Educational status
irhhrh	Relation to household head
iriefalg	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
irlyun	Weeks unemployed last year
irlyww	Weeks worked last year
irmarst	Marital status
irocc	Occupation
irrklyun	Raking foundation: weeks worked
irrklyww	Raking foundation: weeks unemployed
irsamths	Number of Months in receipt of SA
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
urdivwk	New EI Variable
ureff	Base year effective weekly benefit
urern	Base year insurable weekly earnings
urexhas	Exhaustee flag

urgotpa	Received parental benefits
urhrwk	New EI Variable
urmtyp	Claim type
urnere	New EI Variable
urothbr	New EI Variable
urothwk	New EI Variable
urrpeat	Repeat claim flag
urstart	Week claim established
urtpcng	Type change flag
urtrnbr	Training benefit weekly rate
urtrnwkw	Weeks of training benefits
uruer	Local unemployment rate (x10)
urweeks	Claim weeks of benefits
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:

fhhash	Hashed code of header information
hdclohh	Number of SLID clones
hdevmv	Expenditure Vector Matching Variable
hdnpers	Number of persons in household
hdprov	Province
hdseqhh	Household sequence number
hdtenur	Tenure
hdurb	Size of urban area
hdwgthh	Household weight
hnhn	Number of individuals in household
idaddded	Additional deductions from net income (256)
idage	Age
idalexp	Other allowable employment expenses (229)
idalhrs	Total Paid Hours of Work Last Year (imputed)
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/QPP benefit
idcfrh	Relationship to census family head
idcfseq	Census family sub-sequence number
idcgctc	Caregivers tax credit (database) (315)

idcharit	Charitable donations
idclergy	Clergy residential deduction
idcloss	Allowable other years capital loss (253)
idcsa	Converted social assistance
idcuib	Converted UI benefit
iddalimo	Alimony paid (220)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
iddues	Union and professional dues (212)
idedlev	Educational level
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idefrh	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]
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)
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
idiinvnd	Interest and other investment income
idiloss	Business investment losses (217)
idimmi	Years since immigration
idind	Industry
idinseq	Individual sub-sequence number
idintstu	Interest paid on student loans (319)
idipens	Pension income (115)
idisa	Social assistance income
idise	Self-employed income
iditc	Federal investment tax credits (412)
iditoth	Other taxable income (130)
iditrsp	Taxable RRSP withdrawals
idiworkc	Workers compensation benefits
idlbtsg	Gross Labour funds bought (413)
idlfst	Labour force status
idlyfp	Last year full/Part time



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)
idnorth	Northern deductions (255)
idocc	Occupation
idothded	Other deductions from total income (232)
idothpe	Amounts for Infirm Dependents (306)
idpartlo	Limited partnership losses (251)
idpolcon	Federal political contributions (409)
idproptx	Net property taxes paid (556)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	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)
idsamths	Imputed number of months on SA
idsapred	Predicted amount of SA received
idsarank	Predicted ranked likelihood of getting SA
idschtp	School type
idseqino	SLID Individual Identifier (Original)
idsex	Sex
idstkded	Stock option deduction (249)
idsynthi	Synthetic high income person
idtuitn	Tuition fees (320)
iduipred	Predicted amount of UI received
iduirank	Predicted ranked likelihood of getting UI
ucbtyp	Claim type
ucdivwk	Minimum divisor weeks
uceff	Effective weekly rate
ucern	Insurable weekly earnings
ucexhas	Exhaustee flag
ucgotpa	Received parental benefits
uchrwk	Hours worked prior to claim
ucmtyp	Main Claim type (majority of weeks)
ucnere	New entrant re-entrant flag
ucothbr	Other benefits weekly rate
ucothwk	Weeks of other benefits
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
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

<b>gai</b>	Compute new refundable credits or guarantees
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## 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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## 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 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

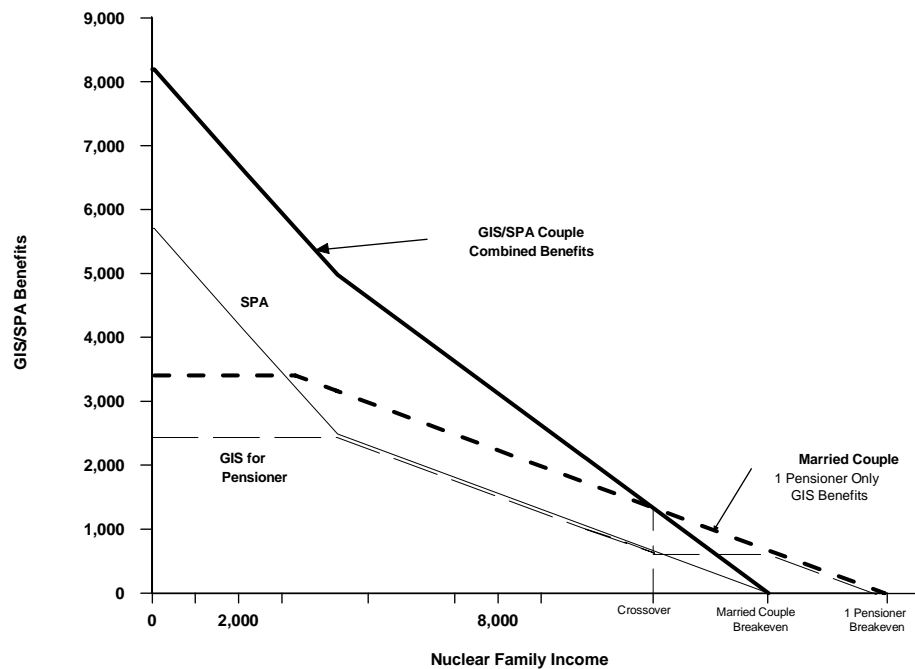


Figure 2 GIS/SPA Benefits for Married Pensioner with Non-Pensioner Spouse

### *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 survey, 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
+ idiinvnd	Interest and Investment Income

+ idiemp	Employment Income
+ idise	Self Employment Income
+ iditoth	Other Income
+ idicqp	CPP/QPP Benefits
+ imipnst	Taxable pension Income (after splitting)
+ iditrsp	Taxable RRSP Withdrawals
+ imiuib	Unemployment Insurance Benefits
- imalexp	Other allowable Employment Expenses
- imcqppc	CPP/QPP Contributions
- imuic	Unemployment Insurance Contributions

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.

### **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]
GISEMPEXM	GIS employment income exemption - maximum
GISEMPEXP	GIS employment income exemption - percentage of earnings
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]
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
SPAOASRR	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
idalexp	Other allowable employment expenses (229)
idclergy	Clergy residential deduction
idicqp	CPP/QPP income (114)
idiemp	Wages & salaries
idiinvnd	Interest and other investment income
idise	Self-employed income
iditoth	Other taxable income (130)
iditrrsp	Taxable RRSP withdrawals
idmarst	Marital status
idrand	Random numbers [array]
imcqppc	CPP/QPP contributions
imdedft	Deductions from total income
imicapgt	Capital gains (taxable)
imidivt	Dividend income (taxable)
imioas	OAS benefits
imipnst	Taxable pension income (after splitting)

imiuib	Unemployment Insurance/Employment Insurance
benefits	
imoaspar	Partial OAS residency flag
imoasres	Partial OAS fraction
impentrd	Pension income deduction from transfer to spouse
imqpipcbr	Quebec parental insurance plan calendar year
benefits	
imqpipp	Quebec parental insurance plan premiums for paid
workers	
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
imoldtyp	Type of GIS/SPA nuclear family
imspamax	Maximum amount of SPA
imspatyp	Type of SPA entitlement

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**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.

### 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:

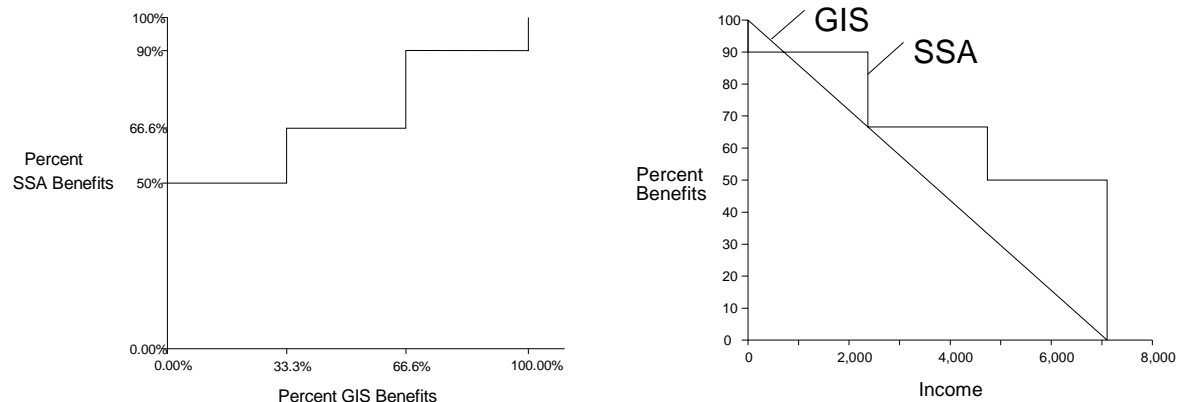


Figure 3. Nova Scotia Special Social Assistance

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 ONTPTG. 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 ALTASOPT 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**

<b>Function</b>	<b>Description</b>
-----------------	--------------------

**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]
ASBBASIC	Alberta seniors benefit annual basic benefit
ASBBASICP	Alberta seniors benefit annual basic benefit for 1st half of year
ASBBOASP	Alberta seniors benefit Basic OAS from previous year

ASBCYFLG	Alberta seniors benefit calendar year calculation flag
ASBEMP	Alberta seniors benefit employment inclusion rate
ASBEMPP	Alberta seniors benefit employment inclusion rate for 1st half of year
ASBNOAS	Alberta seniors benefit reduction if no OAS [senior type]
ASBNOASP	Alberta seniors benefit reduction if no OAS for 1st half of year [senior type]
ASBNSS	Alberta seniors benefit non-senior spouse supplement
ASBNSSP	Alberta seniors benefit non-senior spouse supplement for 1st half of year
ASBRENT	Alberta seniors benefit renter supplement
ASBRENTP	Alberta seniors benefit renter supplement for 1st half of year
ASBRR	Alberta seniors benefit reduction rate [senior type]
ASBRRP	Alberta seniors benefit reduction rate for 1st half of year [senior type]
ASBSAB	Alberta seniors benefit supplemental accommodation benefit
ASBSABP	Alberta seniors benefit supplemental accommodation benefit for 1st half of year
ASBSABRR	Alberta seniors benefit supplemental accommodation reduction rate
ASBSABRRP	Alberta seniors benefit supplemental accommodation reduction rate for 1st half of year
ASBSS	Alberta seniors benefit senior spouse supplement
ASBSSOPT	Alberta seniors benefit 1 senior couple option [1=model separately,2=model as senior couples]
ASBSSOPTP	Alberta seniors benefit 1 senior couple option for 1st half of year
ASBSSP	Alberta seniors benefit senior spouse supplement for 1st half of year
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

NBSBSPA	N.B. Low-Income Seniors' Benefit - SPA eligibility
NFSBBAS	NFLD Low-Income Seniors' Benefit base amount
NFSBCBAS	NFLD Low-Income Seniors' Benefit base amount for senior couples
NFSBCRR	NFLD Low-Income Seniors' Benefit reduction rate for senior couples
NFSBCTD	NFLD Low-Income Seniors' Benefit turndown for senior couples
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
PYINCP	Deflator to calculate income from 2 years prior
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
SASKTECA	Saskatchewan GIS supplement temporary energy cost allowance
TARGETYEAR	Year of analysis

#### INPUT VARIABLES:

hdageeld	Age of eldest in household
hdprov	Province
hdtenur	Tenure
hhnin	Number of individuals in household
idage	Age
idcfrh	Relationship to census family head
idialimo	Alimony income received
idieflag	Cloned institutionalized elderly person
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]



idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idspoflg	Person has spouse
imgisinc	Individual's income for GIS/SPA reduction
imgismax	Maximum amount of GIS
imgistyp	Type of GIS entitlement
imicnet	Net Income (line 236)
imigis	GIS benefits
imioas	OAS benefits
imipnst	Taxable pension income (after splitting)
imispa	Spouse's allowance
imitot	Total income
imoasres	Partial OAS fraction
imrentpd	Imputed rent paid
imspamax	Maximum amount of SPA
imspatyp	Type of SPA entitlement
imuccb	Universal Child Care Benefit amount

#### OUTPUT VARIABLES:

imbcss	British Columbia Seniors Supplement
imiasb	Alberta seniors benefit
imigist	GIS provincial top-up
impptg	Provincial property tax grant for seniors
impstg	Provincial sales tax grant for seniors

<b>isneg</b>	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.

## **lkup1**                      Table look-up with interpolation/extrapolation

---

### **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  $n \times 3$  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.

## **lkup2**                      Table look-up without interpolation

---

### **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 dollars 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 =	idise;
imfoth =	imfecb + imheatrl;
impoth =	idiworkc + impheatr + imresreb;
imicqp =	idicqp;
immemp =	idiemp + idise;
imminv =	idiinvnd + ididiv + idicapg;
immoth =	imipnst + iditoth + idialimo;
immmkt =	immemp + imminv + immoth;
imftran =	imffa + imioas + imiotg + imigis + imispa + imctc + imfcben + imicqp + imfoth + imiuib + imfstc + imqtar + imfsa + imiosa + imfortc + imuccb;
imctcben =	imctc + imfcben;
imfothtr =	imfoth + imfortc;
imfnewpg =	imiotg + imiosa;
imigispa =	imigis + imispa;
impfp =	impfa + imqaafa + imqnbfa + imqfatc + imiafetc + imnbcben + imibcfb + imoccea + imoccect + imscb + imnscb + imibceib + imncb + imnmbns;
imptran =	impfp + imigist + imptc + impsa + importc + iminsda + imnstxrf + impoth + imqpipebn;
immtran =	imptran + imftran;
immtot =	immmkt + immtran;
imftax =	imuic + imcqppc + imrepay + imtxf + imsaclaw (when SACLAWOPT is set to 1);
imptax =	imtxp + imphp + imqpipp + imqpippse;
immtax =	imftax + imptax;
immdisp =	immtot – immtax + imsaclaw (when SACLAWOPT is set to 1);
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 PARAMETERS:

SACLAWOPT	Social assistance NCBS clawback include in tax/income flag
-----------	--

### INPUT VARIABLES:

hhnin	Number of individuals in household
idialimo	Alimony income received
idicapg	Capital gains (actual)
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiinvnd	Interest and other investment income
idipens	Pension income (115)
idise	Self-employed income
iditoth	Other taxable income (130)
idiworkc	Workers compensation benefits
imbft	Basic federal tax
imclimdv	B.C. Climate Action Dividend
imcqppc	CPP/QPP contributions
imctc	Child tax credit
imfcben	Total Federal Child Benefits
imfecb	Federal Energy Cost Benefit
imffa	Federal portion of family allowances
imfortc	Federal other refundable tax credits
imfsa	Federal social assistance
imfstc	Federal sales tax credit
imheatrl	Federal relief for heating expenses
imiafetc	Alberta Family Employment Tax Credit Benefits
imibceib	B.C. Earned Income Benefit
imibcfb	B.C. Family Bonus
imigis	GIS benefits
imigist	GIS provincial top-up
iminet	Net income
iminsda	NS Direct Assistance Program
imioas	OAS benefits
imiosa	Other SA or guarantees
imiotg	Other taxable demogrants
imispa	Spouse's allowance
imiuib	Unemployment Insurance/Employment Insurance
benefits	

immcb	Manitoba Child Benefit
imnbcben	Total NB child tax Benefits
imnncb	Newfoundland Child Benefit
imnmbs	Newfoundland Mother-Baby Nutrition Supplement
imnpfgr	Newfoundland Progressive Family Growth Benefit
imnpsb	Newfoundland Parental Support Benefit
imnscb	Nova Scotia Child Benefit
imnstxrf	Nova Scotia Taxpayer Refund
imocb	Ontario Child Benefit
imoccea	Ont. Child Care Exp. credit allowed (Family)
imoccext	Ont. Child Care Supplement one-time extra benefit
imoshtg	Ontario Senior Homeowners' Property Tax Grant
imotxtgr	Ontario Textbook and Technology Grant
impfa	Provincial family allowance
impheatr	Provincial Home Heating Fuel/Energy Rebate
imphp	Provincial Health Premium
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
imqppcbn	Quebec parental insurance plan calendar year
benefits	
imqpipp	Quebec parental insurance plan premiums for paid
workers	
imqpippse	Quebec parental insurance plan premiums for self-
employed	
imqtar	Quebec tax abatement (refundable)
imrepay	Social Benefits Repayments
imresreb	Alberta Resource Rebate Amount
imsaclaw	Social Assistance NCB Clawback Amount
imscb	Saskatchewan Child Benefit
imtxf	Federal income tax payable
imtxp	Provincial income tax payable
imuccb	Universal Child Care Benefit amount
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

**memo2**            Compute consumable income, etc.

---

## 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 (`CTFLAG=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>imnettr =</code>	<code>immtran - immtax</code>
<code>imothrep =</code>	<code>imrepay - imuibr</code>
<code>imqta =</code>	<code>imqtaa + imqtar</code>



imfedbal =	imftax - imftran
imprvbal =	imptax - imptran
impovinc =	immtot
imatpinc =	immicons

### 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
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]
imatpinc	After tax Income for low income measurement
imfedbal	Federal taxes less transfers
imftax	Federal taxes
immicons	Consumable income
immtax	All taxes
imnettr	Net transfers to person

imothrep	Other federal repayments
impovinc	Before Tax 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 `mpc` 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*

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

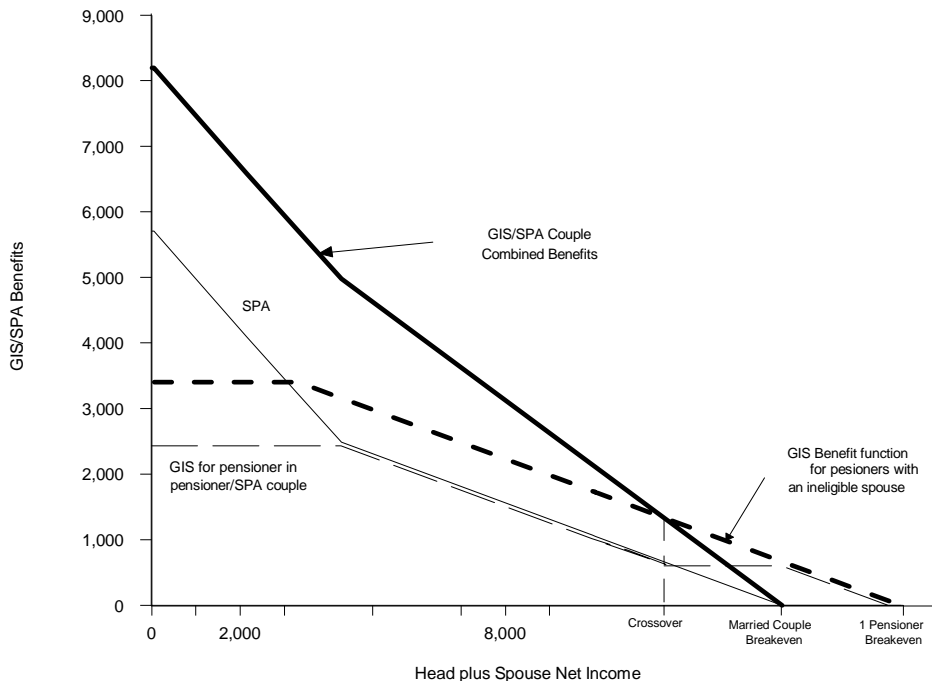


Figure 1 GIS/SPA Benefits for One OAS Pensioner Couples

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".

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

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.

- 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. 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 SHS 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.
- If `SPLTPNSFLAG` or `QSPLTPNSFLAG` is turned on, a check is made to ensure that the corresponding increments (`PENSPLTINCR` and `QPENSPLTINCR`) are greater than zero.

### **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:	
FXVFLAG	Read SHS expenditure vector file
BGISM	Basic GIS - married
BGISS	Basic GIS - single
BOAS	Basic OAS
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
PENSPLTINCR	Increment by which to split pension income
QEMPDEDM	Quebec earned income deduction for workers maximum
QEMPDEDP	Quebec earned income deduction percent of income
QNTCR	Quebec nominal tax credit rate
QPENSPLTINCR	Quebec increment by which to split pension income
QSPLTPNSFLAG	Quebec flag to split pension income
QWITBPIRF	Quebec Working Income Tax Benefit Phase in Rate for families
QWITBPIRS	Quebec Working Income Tax Benefit Phase in Rate for singles
QWITBRR	Quebec Working Income Tax Benefit Reduction Rate
QWITBSAMT	Quebec WITB Supplement for Disabilities Amount
QWPEIPI	Quebec Work Premium Employment Income Phase In [family type]
QWPTD	Quebec Work Premium Income Turndown [family type]
SPAOASRR	OAS portion of SPA taxback rate
SPLTPNSFLAG	Flag to split pension income
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)
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
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
QWITBFAM	Quebec Working Income Tax Benefit amount for couples/single parents
QWITBFPO	Quebec WITB Family Net Income Phase-out Threshold
QWITBMINEF	Quebec Working Income Tax Benefit Minimum Earnings Threshold for families
QWITBMINES	Quebec Working Income Tax Benefit Minimum Earnings Threshold for singles
QWITBSFPO	Quebec WITB Supplement for Disabilities Family Net Income Phase-out Threshold
QWITBSNG	Quebec Working Income Tax Benefit amount for singles
QWITBSPO	Quebec WITB Single Net Income Phase-out Threshold
QWITBSSPO	Quebec WITB Supplement for Disabilities Single Net Income Phase-out Threshold
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 survey.

### 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 SLID survey. 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.  $[immi = 40 \text{ if } (immi \geq 10 \text{ and } TARGETYEAR - idage \leq 12)]$

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, ( $\text{immi} = (38 - (73 - 65)) = 30$ ). 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.

### **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 the survey calendar year, yet who had died before the date of the survey, will not be accounted for in the SPSPD/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.

### **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
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

OUTPUT VARIABLES:

imioas	OAS benefits
imoaspar	Partial OAS residency flag
imoasres	Partial OAS fraction

<b>pmaddent</b>	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.

<b>randrnd</b>	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 SLID. In fact the SLID 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:

ANCBSFT1	Alberta social assistance NCBS flow-through amount for first child
ANCBSFT1P	Alberta SA NCBS flow-through amount for first child for 1st half of year
ANCBSFT2	Alberta social assistance NCBS flow-through amount for second child
ANCBSFT2P	Alberta SA NCBS flow-through amount for second child for 1st half of year
ANCBSFT3	Alberta social assistance NCBS flow-through amount for third (or more) child
ANCBSFT3P	Alberta SA NCBS flow-through amount for third (or more) child for 1st half of year
ASHELTER	Alberta Shelter Increase by number of persons in household
ASHELTERP	Alberta Shelter Increase by number of persons in household for 1st half of year
ASHELTFLG	Alberta Shelter Increase under NCBS clawback flag
ASHELTFLGP	Alberta Shelter Increase under NCBS clawback flag for 1st half of year
FCBENCAL	Calculate child benefits for calendar year flag
MCLAWPCT	Manitoba SA Clawback percentage kids over flow through age in families [#kids][#kids<age]
MCLAWPCTP	Manitoba SA Clawback percentage kids over flow through age for 1st half of year [#kids][#kids<age]
MCLAWSA12	Manitoba Social assistance NCBS clawback for children 12 and under
MCLAWSA12P	Manitoba SA NCBS clawback for children 12 and under for 1st half of year
MCLAWSA6	Manitoba Social assistance NCBS clawback for children 6 and under
MCLAWSA6P	Manitoba SA NCBS clawback for children 6 and under for 1st half of year
NCLAWSA1	Newfoundland social assistance clawback amount for first child
NCLAWSA1P	Newfoundland SA clawback amount for first child for 1st half of year
NCLAWSA2	Newfoundland social assistance clawback amount for each additional child

NCLAWSA2P      Newfoundland SA clawback amount for each  
 additional child for 1st half of year  
 ONCBSFT1      Ontario social assistance NCBS flow-through  
 amount for first child  
 ONCBSFT1P      Ontario SA NCBS flow-through amount for first  
 child for 1st half of year  
 ONCBSFT2      Ontario social assistance NCBS flow-through  
 amount for second child  
 ONCBSFT2P      Ontario SA NCBS flow-through amount for second  
 child for 1st half of year  
 ONCBSFT3      Ontario social assistance NCBS flow-through  
 amount for third (or more) child  
 ONCBSFT3P      Ontario SA NCBS flow-through amount for third (or  
 more) child for 1st half of year  
 PNCBSFT      P.E.I. social assistance NCBS flow-through amount  
 per child  
 PNCBSFTP      P.E.I. SA NCBS flow-through amount per child for  
 1st half of year  
 QNCBSFT1      Quebec social assistance NCBS flow-through amount  
 for first child  
 QNCBSFT1P      Quebec SA NCBS flow-through amount for first  
 child for 1st half of year  
 QNCBSFT2      Quebec social assistance NCBS flow-through amount  
 for second child  
 QNCBSFT2P      Quebec SA NCBS flow-through amount for second  
 child for 1st half of year  
 QNCBSFT3      Quebec social assistance NCBS flow-through amount  
 for third (or more) child  
 QNCBSFT3P      Quebec SA NCBS flow-through amount for third (or  
 more) child for 1st half of year  
 SACLAWFLAG      Social assistance NCBS clawback flag  
 SACLAWPR      Social assistance clawback flag [prov]  
 SAELOPT      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]  
 cfnkids      Number of children in census family  
 cfnpers      Number of persons in census family  
 hdprov      Province  
 hhncf      Number of census families in household  
 idage      Age

idisa	Social assistance income
idsamths	Imputed number of months on SA
idsapred	Predicted amount of SA received
idsarank	Predicted ranked likelihood of getting SA
imfcbene	Total Federal Child Benefit Supplement
imigist	GIS provincial top-up
imscb	Saskatchewan Child Benefit

#### OUTPUT VARIABLES:

imashelt	Alberta shelter increase under NCBS clawback
imfsa	Federal social assistance
imisa	Social assistance (or replacement program)
impsa	Provincial social assistance
imsaclaw	Social Assistance NCB Clawback Amount

---

<b>strn</b>	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.

---

<b>taxbak1</b>	One level tax-back function
----------------	-----------------------------

---

## SUMMARY

```
NUMBER taxbak1(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 taxbak1 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, taxbak1 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

```
NUMBER taxbak2(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 taxbak2 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, taxbak2 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)

impmartc	Married and equivalent-to-married tax credit	(AMXM, AMXMT, AEMXM, AEMXMT)
impcgtc	Caregiver tax credit	(ACGTC, ACGTCFLG)
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 using AFETCAPC, which is based on 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
AAMTPCTF	Alta amt rate as pct of additional fed tax due to minimum tax
AAMTPCTM	Alta amt rate as pct of federal minimum tax amount
AAMTTX	Alta amt rate as tax on adjusted income
AAXM	Alta Age Amount
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



ACGTCOPT	Alta Caregiver Tax Credit Option (1=max, 2=greenbook, 3=model)
ACGTCTD	Alta Caregiver Tax Credit income turndown
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
ADTCRLC	Alta dividend tax credit rate from large (eligible) corporations
AEDXPM	Alta Education Amount per month of full-time studies
AEDXPMPT	Alta Education Amount per month of part-time studies
AEMXM	Alta equivalent to married amount
AEMXMT	Alta equivalent to married turndown level
AFETCAPC	Alberta Family Employment Tax Credit Amount Per Child [number of children]
AFETCAPCP	Alberta Family Employment Tax Credit Amount Per Child for 1st half of year
AFETCBR	Alberta Family Employment Tax Credit Benefit Rate
AFETCBRP	Alberta Family Employment Tax Credit Benefit Rate for 1st half of year
AFETCCI	Alberta Family Employment Tax Credit Benefit Cut-in Level
AFETCCIP	Alberta Family Employment Tax Credit Benefit Cut-in Level for 1st half of year
AFETCFLAG	Alberta Family Employment Tax Credit Activation Flag
AFETCNC	Alberta Family Employment Tax Credit Maximum Number of Children
AFETCNCP	Alberta Family Employment Tax Credit Maximum Number of Children for 1st half of year
AFETCPI	Alberta Family Employment Tax Credit phase in
AFETCPIP	Alberta Family Employment Tax Credit phase in for 2nd half of year
AFETCRR	Alberta Family Employment Tax Credit Reduction Rate
AFETCRRP	Alberta Family Employment Tax Credit Reduction Rate for 1st half of year
AFETCTD	Alberta Family Employment Tax Credit Turndown Level
AFETCTDP	Alberta Family Employment Tax Credit Turndown Level for 1st half of year
AFTAX	Alberta flat surtax rate on taxable income
AHCIPF	Alberta Health Care Insurance Plan Family Premium
AHCIPFLG	Alberta Health Care Insurance Plan activation flag

AHCIPFSB	Alberta Health Care Insurance Plan Family Subsidy Table
AHCIPINCLG	Alberta Health Care Insurance Plan flag to give to highest earner
AHCIPIT	Alberta Health Care Insurance Plan Income Threshold [family type]
AHCIPS	Alberta Health Care Insurance Plan Single Premium
AHCIPSOPT	Alberta Health Care Insurance Plan Subsidy option (1=table, 2=flat rate)
AHCIPSPI	Alberta Health Care Insurance Plan Senior Exemption Phase In
AHCIPSR	Alberta Health Care Insurance Plan Subsidy Rate
AHCIPSSB	Alberta Health Care Insurance Plan Single Subsidy Table
AHEATFLG	Alberta Energy Tax Refund activation flag
AHEATREB	Alberta Energy Tax Refund amount
ALTASOPT	Alberta seniors option [1=GIST,2=new seniors benefit 1994]
AMAXDX	Alta Maximum Disability deduction/amount
AMAXET	Alta maximum on transfer of education and tuition amount
AMEDALL	Alta Medical allowance maximum lower limit
AMEDANF	Alta Medical allowance lower limit net income fraction
AMXM	Alta married amount
AMXMT	Alta married amount turndown level
AODISTC	Alta Maximum infirm dependent 18 or older tax credit
APNTRC	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]
ARESREB	Alberta Resource Rebate Amount
ASBEMP	Alberta seniors benefit employment inclusion rate
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
AYPNL	Alta Pension Income Deduction Amount
FCBENCAL	Calculate child benefits for calendar year flag
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior

# 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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idestat	Educational status
idialimo	Alimony income received
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)
idise	Self-employed income
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idothpe	Amounts for Infirm Dependants (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
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
imiasb	Alberta seniors benefit
imicnet	Net Income (line 236)
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imioas	OAS benefits
imipnst	Taxable pension income (after splitting)
imisdivt	Dividend income from small corporations (taxable)
imitax	Taxable income
imitot	Total income
imminamt	Minimum Amount due to Federal Minimum Tax
imuccb	Universal Child Care Benefit amount
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
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
impcgctcp	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impheatr	Provincial Home Heating Fuel/Energy Rebate
imphp	Provincial Health Premium
impintsl	Provincial interest on student loans tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impnit	Provincial net income tax
impothpe	Provincial infirm dependents 18 or older 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 transferred
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imresreb	Alberta Resource Rebate Amount
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 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 (CPNTCR) 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)
impmartc	Married and equivalent-to-married tax credit	(CMXM, CMXMT, CEMXM, CEMXMT)
impcgtc	Caregiver tax credit	(CCGTC, CCGTCFLG)
impchrtc	Charitable donations	(CCHATL1, CCHATR1, CCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(CMAXDX)
impdtxc	Dividend tax credit	(CDTCR)
impdtxc	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.

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
BCBEIS1P	B.C. Earned Income Benefit for first child for 1st half of year
BCBEIS2	B.C. Earned Income Benefit for second child
BCBEIS2P	B.C. Earned Income Benefit for second child for 1st half of year
BCBEIS3	B.C. Earned Income Benefit for each additional child
BCBEIS3P	B.C. Earned Income Benefit for each additional child for 1st half of year
BCBEITD	B.C. Earned Income Benefit Turndown
BCBEITDP	B.C. Earned Income Benefit Turndown for 1st half of year
BCBEMX	B.C. Earned Income Benefit Income Reduction
BCBEMXP	B.C. Earned Income Benefit Income Reduction for 1st half of year
BCBERR1	B.C. EIB reduction rate for families with 1 child
BCBERR1P	B.C. EIB reduction rate for families with 1 child for 1st half of year
BCBERR2	B.C. EIB reduction rate for families with 2 children
BCBERR2P	B.C. EIB reduction rate for families with 2 children for 1st half of year
BCBERR3	B.C. EIB reduction rate for families with 3+ children
BCBERR3P	B.C. EIB reduction rate for families with 3+ children for 1st half of year
BCEIBFLG	Activate B.C. Earned Income Benefit Program
BCEIBFLGP	Activate B.C. Earned Income Benefit Program for 1st half of year
BCEIBPI	B.C. Earned Income Benefit Income Phase In
BCEIBPIP	B.C. Earned Income Benefit Income Phase In for 1st half of year
BCFBBAS	B.C. Family Bonus amount per child
BCFBBASP	B.C. Family Bonus amount per child for 1st half of year
BCFBFLAG	Activate B.C. Family Bonus Program
BCFBIFS	Activate B.C. Family Bonus to include Federal NCS

BCFBIFSP	Activate B.C. Family Bonus to include Federal NCS for 1st half of year
BCFBNCS1	B.C. Family Bonus National Child Supplement for first child
BCFBNCS1P	B.C. Family Bonus National Child Supplement for first child for 1st half of year
BCFBNCS2	B.C. Family Bonus National Child Supplement for second child
BCFBNCS2P	B.C. Family Bonus National Child Supplement for second child for 1st half of year
BCFBNCS3	B.C. Family Bonus National Child Supplement for each additional child
BCFBNCS3P	B.C. Family Bonus National Child Supplement for each additional child for 1st half of year
BCFBNCSRR1	B.C. Family Bonus NCS reduction rate for families with 1 child
BCFBNCSRR1P	B.C. Family Bonus NCS reduction rate for families with 1 child for 1st half of year
BCFBNCSRR2	B.C. Family Bonus NCS reduction rate for families with 2 children
BCFBNCSRR2P	B.C. Family Bonus NCS reduction rate for families with 2 children for 1st half of year
BCFBNCSRR3	B.C. Family Bonus NCS reduction rate for families with 3+ children
BCFBNCSRR3P	B.C. Family Bonus NCS reduction rate for families with 3+ children for 1st half of year
BCFBNCSTD	B.C. Family Bonus National Child Supplement Turndown
BCFBNCSTD P	B.C. Family Bonus National Child Supplement Turndown for 1st half of year
BCFBRR	B.C. Family Bonus multiple child reduction rate
BCFBRRP	B.C. Family Bonus multiple child reduction rate for 1st half of year
BCFBRRS	B.C. Family Bonus single child reduction rate
BCFBRRSP	B.C. Family Bonus single child reduction rate for 1st half of year
BCFBTD	B.C. Family Bonus Turndown
BCFBTD P	B.C. Family Bonus Turndown for 1st half of year
CAMTFTCFLG	B.C. amt flag for provincial foreign tax credit
CAMTOPT	B.C. alternative minimum tax option
CAMTPCTF	B.C. amt rate as pct of additional fed tax due to minimum tax
CAMTPCTM	B.C. amt rate as pct of federal minimum tax amount
CAMTTX	B.C. amt rate as tax on adjusted income
CAXM	B.C. Age Amount
CAXRR	B.C. Age Amount credit reduction rate



CAXTD	B.C. Age Amount net income turndown
CBXM	B.C. Basic Personal Exemption/amount
CCATCA	B.C. Climate Action Tax Credit amount for adults
CCATCAP	B.C. Climate Action Tax Credit amount for adults for 1st half of year
CCATCC	B.C. Climate Action Tax Credit amount for children
CCATCCP	B.C. Climate Action Tax Credit amount for children for 1st half of year
CCATCFL	B.C. Climate Action Tax Credit family reduction level
CCATCFLG	B.C. Climate Action Tax Credit activation flag
CCATCFLP	B.C. Climate Action Tax Credit family reduction level for 1st half of year
CCATCR	B.C. Climate Action Tax Credit reduction rate
CCATCRP	B.C. Climate Action Tax Credit reduction rate for 1st half of year
CCATCSL	B.C. Climate Action Tax Credit individual reduction level
CCATCSLP	B.C. Climate Action Tax Credit individual reduction level for 1st half of year
CCGTC	B.C. Caregiver Tax Credit
CCGTCFLG	B.C. Caregiver Tax Credit activation flag
CCGTCOPT	B.C. Caregiver Tax Credit Option (1=max, 2=greenbook, 3=model)
CCGTCTD	B.C. Caregiver Tax Credit income turndown
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
CCLIMDIV	B.C. Climate Action Dividend
CDTCR	B.C. dividend tax credit rate
CDTCRLC	B.C. dividend tax credit rate from large (eligible) corporations
CEDXPM	B.C. Education Amount per month of full-time studies
CEDXPMPT	B.C. Education Amount per month of part-time studies
CEMXM	B.C. equivalent to married amount
CEMXMT	B.C. equivalent to married turndown level
CHEATFAM	British Columbia Refundable Energy Credit for families
CHEATFLG	British Columbia Refundable Energy Credit activation flag
CHEATSNG	British Columbia Refundable Energy Credit for singles
CLITR	B.C. Low Income Tax Reduction Credit

CLITRRR	B.C. Low Income Tax Reduction Credit reduction rate
CLITRTD	B.C. Low Income Tax Reduction Credit net income turndown
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
CMEDALL	B.C. Medical allowance maximum lower limit
CMEDANF	B.C. Medical allowance lower limit net income fraction
CMSP	B.C. Medical Services Plan Premium [family size, amount]
CMSPADED	B.C. Medical Services Plan Age 65+ Deduction
CMSPCED	B.C. Medical Services Plan Child Deduction
CMSPDDED	B.C. Medical Services Plan Disability Deduction
CMSPFLAG	B.C. Medical Services Plan activation flag
CMSPINCF	B.C. Medical Services Plan flag to give to highest earner
CMSPRATE	B.C. Medical Services Plan Subsidy Rate [income, rate]
CMSPSDED	B.C. Medical Services Plan Spouse Deduction
CMXM	B.C. married amount
CMXMT	B.C. married amount turndown level
CODISTC	B.C. Maximum infirm dependent 18 or older tax credit
CPNTR	B.C. provincial non-refundable tax credit rate
CPTCBEN	Maximum B.C. political tax credit allowed
CPTCRE	British Columbia political tax credit refundable flag
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
CRTB	British Columbia renter tax reduction basic credit
CRTD	British Columbia renter tax reduction credit for other dependants
CTRP	British Columbia renter tax reduction proportion of rent allowed
CRTPN	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
CSTCKID	British Columbia stc amount for children
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)
CSUPCR	British Columbia supplemental tax credit
CTCINC	Refundable CTC family income scaling factor
CTXFLG	B.C. tax on taxable income activation flag
CYPNDL	B.C. Pension Income Deduction Amount
FCBENCAL	Calculate child benefits for calendar year flag
GSTCYFLG	GST credit calendar year calculation activation flag
HEATSNG	Federal relief for heating expenses for singles
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior

#### 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+)
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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idestat	Educational status
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)
idise	Self-employed income
idlbtngx	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idnf	Person's nuclear family [pointer]
idothpe	Amounts for Infirm Dependants (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)
idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
minimum tax	
imbft	Basic federal tax
imccea	Child care expenses allowed
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 Benefit Supplement
imheatrl	Federal relief for heating expenses
imicnet	Net Income (line 236)
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisdivt	Dividend income from small corporations (taxable)
imitax	Taxable income

immartxc	Married tax credit claimed
imminamt	Minimum Amount due to Federal Minimum Tax
imrentpd	Imputed rent paid
imuccb	Universal Child Care Benefit amount
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
imcatc	B.C. Refundable Climate Action Tax Credit
imclimdv	B.C. Climate Action Dividend
imibceib	B.C. Earned Income Benefit
imibcfb	B.C. Family Bonus
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	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impheatr	Provincial Home Heating Fuel/Energy Rebate
imphp	Provincial Health Premium
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impothpe	Provincial infirm dependents 18 or older 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

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<b>txcalc</b>	Calculate federal income tax
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## 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 (imdivt). 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 (idlbtgxg). The credit (imlbtxc) is equal to FLVCRT times the gross amount (idlbtgxg) 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.

## 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)

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:

the combined Education and Tuition amount not required to reduce Basic Federal Tax to zero, and

the maximum transferable of the combined Education and Tuition amount (MAXET)

The actual amount transferred (imttxcrt) is calculated by reducing the amount potentially transferred (txcrt) 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)

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 Surtax***

In 1985 a Federal Surtax was introduced as an additional tax based on Basic Federal Tax payable.

### **SPSM Implementation**

The model allows for two surtax levels and two 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).

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.

### **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 (imamtinc) by adding the following items to imitax:

- RPP Contributions (idrpp) when AMTRPFLG is set to 1
- RRSP Contributions (idrrsp) when AMTRPFLG is set to 1
- Other Deductions from Total Income (idothded, representing Capital Cost Allowances)
- the non-taxable portion of Capital Gains (idicapg \* (AMTINCRT - CAPGIR))
- exploration and development expenses (idexplor)
- employee home relocation loan deduction (idemplo)
- stock option and shares deduction when AMTSTK is set to 1
- limited partnership losses (idpartlo)
- allowable other years non-capital losses (idnclos)

The taxable portion of dividends (imidivt) times AMTDIV, net non-deductible capital losses, the allowable portion of business investment losses (imiloss) times the applicable rates defined as  $((AMTINCRT - CAPGIR)/CAPGIR)$  and the basic exemption (AMTEX) are subtracted from this value.

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

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

- Basic Tax Credit (imbtc)
- Spouse or Equivalent 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) for self
- Other Dependent Tax Credit (imothpe)
- CPP/QPP Contribution Tax Credit (imcppctc)
- UI Contribution Tax Credit (imuictc)
- Basic Personal Amount Supplement (imbtcsc)
- Caregiver Tax Credit (imcgctc)

If the value of the Basic Minimum Tax (amtbf) exceeds Basic Federal Tax (imbft), Federal Tax Payable (imtxf) is recalculated as Basic Minimum Tax (amtbf) plus any federal surtaxes on amtbf. 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 variable idothded (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.

## CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

AMTDIV	Alternative minimum tax: percentage of taxable dividends
AMTDIVLC	Alternative minimum tax: percentage of eligible taxable dividends
AMTEX	Alternate minimum tax: exemption level
AMTFORTX	Alternative minimum tax: Foreign Income Tax Rate
AMTINCRT	Alternative minimum tax: Inclusion Rate
AMTNEGTI	Alternative minimum tax: Allow Negative Taxable Income Flag
AMTPRVDF	Alternative minimum tax: prov. tax difference definition[prov]
AMTRPFLG	RRSP/RPP included in Alternate minimum tax (1=included)
AMTSTK	Alternative minimum tax: Stock Option Proportion
AMTTX	Alternate minimum tax rate
BXM	Basic personal exemption/amount
BXMEXT	Basic personal amount extra top-up
CAPGIR	Capital gains inclusion rate
CGTC	Caregiver Tax Credit
CGTCFLG	Caregiver Tax Credit activation flag
CGTCOPT	Caregiver Tax Credit option (1=max, 2=greenbook, 3=model)
CGTCTD	Caregiver Tax Credit income turndown

CWITBFAM	B.C. Working Income Tax Benefit amount for couples/single parents
CWITBFPO	B.C. WITB Family Net Income Phase-out Threshold
CWITBMINE	B.C. Working Income Tax Benefit Minimum Earnings Threshold
CWITBPIR	B.C. Working Income Tax Benefit Phase in Rate
CWITBRR	B.C. Working Income Tax Benefit Reduction Rate
CWITBSAMT	B.C. WITB Supplement for Disabilities Amount
CWITBSCR	B.C. WITB Supplement for Disabilities Reduction Rate for eligible couples
CWITBSFPO	B.C. WITB Supplement for Disabilities Family Net Income Phase-out Threshold
CWITBSMINE	B.C. WITB Supplement for Disabilities Minimum Earnings Threshold
CWITBSNG	B.C. Working Income Tax Benefit amount for singles
CWITBSPIR	B.C. WITB Supplement for Disabilities Phase in Rate
CWITBSPO	B.C. WITB Single Net Income Phase-out Threshold
CWITBSRR	B.C. WITB Supplement for Disabilities Reduction Rate
CWITBSSPO	B.C. WITB Supplement for Disabilities Single Net Income Phase-out Threshold
FDTCR	Federal dividend tax credit rate
FDTCLC	Federal dividend tax credit rate from large (eligible) corporations
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
FSURR1	Federal surtax rate 1
FSURR2	Federal surtax rate 2
FSURTRMX	Maximum federal surtax reduction
FSURTRRL	Federal surtax reduction reduction level
FSURTRRR	Federal surtax 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
MEDRTD	Refundable medical expense supplement income turndown
QTAP	Quebec tax abatement proportion of basic federal tax
QWITBFAM	Quebec Working Income Tax Benefit amount for couples/single parents
QWITBFPO	Quebec WITB Family Net Income Phase-out Threshold
QWITBMINEF	Quebec Working Income Tax Benefit Minimum Earnings Threshold for families
QWITBMINES	Quebec Working Income Tax Benefit Minimum Earnings Threshold for singles
QWITBPIRF	Quebec Working Income Tax Benefit Phase in Rate for families
QWITBPIRS	Quebec Working Income Tax Benefit Phase in Rate for singles
QWITBRR	Quebec Working Income Tax Benefit Reduction Rate
QWITBSAMT	Quebec WITB Supplement for Disabilities Amount
QWITBSCRR	Quebec WITB Supplement for Disabilities Reduction Rate for eligible couples
QWITBSFPO	Quebec WITB Supplement for Disabilities Family Net Income Phase-out Threshold
QWITBSMINE	Quebec WITB Supplement for Disabilities Minimum Earnings Threshold
QWITBSNG	Quebec Working Income Tax Benefit amount for singles
QWITBSPIR	Quebec WITB Supplement for Disabilities Phase in Rate
QWITBSPO	Quebec WITB Single Net Income Phase-out Threshold
QWITBSRR	Quebec WITB Supplement for Disabilities Reduction Rate
QWITBSSPO	Quebec WITB Supplement for Disabilities Single Net Income Phase-out Threshold
WITBFAM	Working Income Tax Benefit amount for couples/single parents
WITBFLAG	Working Income Tax Benefit activation flag
WITBFPO	WITB Family Net Income Phase-out Threshold
WITBMINE	Working Income Tax Benefit Minimum Earnings Threshold
WITBPIR	Working Income Tax Benefit Phase in Rate
WITBRR	Working Income Tax Benefit Reduction Rate

WITBSAMT	WITB Supplement for Disabilities Amount
WITBSCRR	WITB Supplement for Disabilities Reduction Rate for eligible couples
WITBSFPO	WITB Supplement for Disabilities Family Net Income Phase-out Threshold
WITBSMINE	WITB Supplement for Disabilities Minimum Earnings Threshold
WITBSNG	Working Income Tax Benefit amount for singles
WITBSPIR	WITB Supplement for Disabilities Phase in Rate
WITBSPO	WITB Single Net Income Phase-out Threshold
WITBSRR	WITB Supplement for Disabilities Reduction Rate
WITBSSPO	WITB Supplement for Disabilities Single Net Income Phase-out Threshold

#### 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
hhnnf	Number of nuclear families in household
idage	Age
idalexp	Other allowable employment expenses (229)
idcfrh	Relationship to census family head
idcgtc	Caregivers tax credit (database) (315)
idclergy	Clergy residential deduction
idcross	Allowable other years capital loss (253)
iddisab	Disability status (age 16+)
iddisslf	Disability amount for self (316)
iddues	Union and professional dues (212)
ideducfm	Eligible full-time months of education
idemplo	Employee home relocation loan dedn (248)
idexplor	Exploration and development expenses (224)
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]
idise	Self-employed income
iditc	Federal investment tax credits (412)

idiworkc	Workers compensation benefits
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)
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idspoflg	Person has spouse
imatxc	Age tax credit
imbcss	British Columbia Seniors Supplement
imbtc	Basic personal tax credit
imbtcsc	Basic personal tax credit supplement
imcapgex	Modelled capital gains deduction (254)
imchartc	Charitable donations tax credit
imchdtxc	Non-refundable Child Tax Credit
imcppctc	CPP contributions tax credit
imcppse	CPP contributions deduction for self-emp
imcqpcc	CPP/QPP contributions
imctxcs	Dependent children tax credits
imdedfn	All deductions from net income
imdepmi	Dependant's net income
imdisatc	Disability tax credit
imedtxc	Education allowance tax credit
imemptxc	Canada Employment Credit
imicnet	Net Income (line 236)
imigis	GIS benefits
imildivt	Dividend income from large (eligible)
corporations	(taxable)
imiloss	Modelled Business investment losses (217)
iminet	Net income
imintsl	Federal interest on student loans tax credit
imisa	Social assistance (or replacement program)
imisdivt	Dividend income from small corporations (taxable)
imispa	Spouse's allowance
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)
impentxc	Pension income tax credit
imqpiptc	Quebec parental insurance plan premium tax credit
for paid workers	(federal)
imqpsetc	Quebec parental insurance plan premium tax credit
for self-employed	(federal)
imstkded	Modelled Stock option deduction (249)



imtutxc	Tuition tax credit
imtxttxc	Federal textbook tax credit
imuccb	Universal Child Care Benefit amount
imuic	UIC contributions
imuictc	UIC contributions tax credit
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:

imamtdf	Difference due to minimum tax
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
minimum tax	
imatxcrt	Total tax credits applied
imbft	Basic federal tax
imcgtc	Caregiver Tax Credit Level
imcgtpc	Dependent 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
imlabtxc	Federal labour-sponsored funds tax credit
immedref	Refundable medical expense supplement (452)
imminamt	Minimum Amount due to Federal Minimum Tax
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
imwitb	Working Income Tax Benefit
imwitbs	Working Income Tax Benefit Supplement for
Disabilities	

## 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 the base year 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 (imicnet).

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 (imicnet) to re-allocate the deduction if necessary.

## CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
BXM	Basic personal exemption/amount
BXMEXT	Basic personal amount extra top-up
CCEAEMPF	CCEA fraction of employment income (Limit 'B')
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
CCEPTFLG	CCE part-time student flag
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)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idiemp	Wages & salaries
idise	Self-employed income
idsex	Sex
imccez	Is CCE zeroed?
imictot	Total Income (line 150)
imitot	Total income

#### OUTPUT VARIABLES:

imccea	Child care expenses allowed
imccec	Child care expenses claimed on behalf of child
imdedft	Deductions from total income
imicnet	Net Income (line 236)
iminet	Net income

<b>txctc</b>	Compute child tax credit
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## 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 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 also adds GIS, SPA, and Social Assistance benefits to family net income. 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 (`nfnkids * 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
ACBC1P	Alberta Child benefit per child aged 0 - 6 for 1st half of year
ACBC2	Alberta Child benefit per child aged 7 - 11
ACBC2P	Alberta Child benefit per child aged 7 - 11 for 1st half of year
ACBC3	Alberta Child benefit per child aged 12- 15
ACBC3P	Alberta Child benefit per child aged 12- 15 for 1st half of year
ACBC4	Alberta Child benefit per child aged 16- 17
ACBC4P	Alberta Child benefit per child aged 16- 17 for 1st half of year
CTCERF	Refundable CTC child care expense reduction fraction
CTCINC	Refundable CTC family income scaling factor
CTCOPT	Refundable Child tax credit option
CTCPC	Refundable Child tax credit per child
CTCREF	Refundable CTC post-reform rules flag
CTCRR	Refundable Child tax credit reduction rate
CTCSUP	Refundable CTC young child supplement
CTCTD	Family income refundable child tax credit turndown
CTCTUR	Refundable CTC take up rate table [benefit,rate]
FCBBAS	Basic child benefit (per child)
FCBBASP	Basic child benefit (per child) for 1st half of year
FCBECI	Child benefits earning supplement cut-in level
FCBECIP	Child benefits earning supplement cut-in level for 1st half of year
FCBEIE	Flag for WIS dependent on number of children
FCBEIEP	Flag for WIS dependent on number of children for 1st half of year
FCBEIS	Child benefits earned income supplement
FCBEIS1	WIS/NCBS for first child
FCBEIS1P	WIS/NCBS for first child for 1st half of year
FCBEIS2	WIS/NCBS for second child
FCBEIS2P	WIS/NCBS for second child for 1st half of year
FCBEIS3	WIS/NCBS for each additional child

FCBEIS3P	WIS/NCBS for each additional child for 1st half of year
FCBEISP	Child benefits earned income supplement for 1st half of year
FCBEMX	Earnings where WIS phase-in is at maximum
FCBEMXP	Earnings where WIS phase-in is at maximum for 1st half of year
FCBENCAL	Calculate child benefits for calendar year flag
FCBERR	Child benefits earning supplement reduction rate
FCBERR1	WIS/NCBS reduction rate for families with 1 child
FCBERR1P	WIS/NCBS reduction rate for families with 1 child for 1st half of year
FCBERR2	WIS/NCBS reduction rate for families with 2 children
FCBERR2P	WIS/NCBS reduction rate for families with 2 children for 1st half of year
FCBERR3	WIS/NCBS reduction rate for families with 3+ children
FCBERR3P	WIS/NCBS reduction rate for families with 3+ children for 1st half of year
FCBERRP	Child benefits earning supplement reduction rate for 1st half of year
FCBESR	Child benefits earned income supplement rate
FCBESRP	Child benefits earned income supplement rate for 1st half of year
FCBETD	WIS/NCBS turndown level
FCBETDP	WIS/NCBS turndown level for 1st half of year
FCBLRG	Supplement for 3rd and subsequent kids
FCBLRGP	Supplement for 3rd and subsequent kids for 1st half of year
FCBPI	Federal Child Tax Benefit phase-in rate
FCBPIP	Federal Child Tax Benefit phase-in rate for 2nd half of year
FCBRR	Multi-children family income reduction rate
FCBRRP	Multi-children family income reduction rate for 1st half of year
FCBRRS	Single-child family income reduction rate
FCBRRSP	Single-child family income reduction rate for 1st half of year
FCBTD	Federal child benefits family income turndown
FCBTDP	Federal child benefits family income turndown for 1st half of year
FCBUCCB	Flag for Supplement for children age 6
FCBUCCBP	Flag for Supplement for children age 6 for 1st half of year
FCBYNG	Supplement for children under age 7



FCBYNGP of year	Supplement for children under age 7 for 1st half
FCBYNGR	Child care expense reduction rate
FCBYNGRP year	Child care expense reduction rate for 1st half of
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior
QCBC1	Quebec Child benefit for 1st child
QCBC1P of year	Quebec Child benefit for 1st child for 1st half
QCBC2	Quebec Child benefit for 2nd child
QCBC2P of year	Quebec Child benefit for 2nd child for 1st half
QCBC3	Quebec Child benefit for 3rd child
QCBC3P of year	Quebec Child benefit for 3rd child for 1st half
QCBCFLG methodology	Quebec Child benefit flag for Quebec calculation
QCBCFLGP methodology	Quebec Child benefit flag for Quebec calculation for 1st half of year
QCBCS	Quebec Child benefit supplement child aged 12- 17
QCBCSP for 1st half of year	Quebec Child benefit supplement child aged 12- 17

#### 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
hdprov	Province
hhncf	Number of census families in household
hhnnf	Number of nuclear families in household
idage	Age
idiemp	Wages & salaries
idise	Self-employed income
idrand	Random numbers [array]
idsex	Sex
imcce	Child care expenses claimed on behalf of child
imicnet	Net Income (line 236)
imuccb	Universal Child Care Benefit amount
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 Benefit Supplement

**txfstc**                      Compute federal sales tax credit

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## 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 also adds GIS, SPA, and Social Assistance benefits to family net income. 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 (`nfncids * 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.

The federal sales tax credit is claimable at age 19. Parents may claim additional amounts for children aged 18 and younger. 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 was no change in the 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
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#### INPUT PARAMETERS:

FECBFLAG	Federal Energy Cost Benefit activation flag
FECBGIS	Federal Energy Cost Benefit for GIS recipients
FECBNCBS	Federal Energy Cost Benefit for NCBS recipients
FSTCC	Federal sales tax credit amount for dependant
FSTCCP	Federal sales tax credit amount for dependant for 1st half of year
FSTCF	Federal sales tax credit amount for filer
FSTCFP	Federal sales tax credit amount for filer for 1st half of year
FSTCL	Federal sales tax credit reduction level
FSTCLP	Federal sales tax credit reduction level for 1st half of year
FSTCR	Federal sales tax credit reduction rate
FSTCRP	Federal sales tax credit reduction rate for 1st half of year
FSTCS	Federal sales tax credit amount for spouse
FSTCSP	Federal sales tax credit amount for spouse for 1st half of year
GSTAC	GST additional credit amount
GSTACP	GST additional credit amount for 1st half of year
GSTAR	GST additional credit rate of net income
GSTARP	GST additional credit rate of net income for 1st half of year
GSTASPFLAG	Maximum GST additional credit for single parents flag
GSTASPFLAGP	Maximum GST additional credit for single parents flag for 1st half of year
GSTAXM	GST additional credit exemption

GSTAXMP	GST additional credit exemption for 1st half of year
GSTCTUNC	GST credit take up by number of children
GSTCYFLG	GST credit calendar year calculation activation flag
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
PYINCP	Deflator to calculate income from 2 years prior

#### INPUT VARIABLES:

cfageeld	Age of eldest in census family
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+)
cfspoflg	Census family contains married couple
hhncf	Number of census families in household
hhnin	Number of individuals in household
idage	Age
idrand	Random numbers [array]
imfcbene	Total Federal Child Benefit Supplement
imicnet	Net Income (line 236)
imigis	GIS benefits
imispa	Spouse's allowance
imitax	Taxable income
imuccb	Universal Child Care Benefit amount

#### OUTPUT VARIABLES:

imfecb	Federal Energy Cost Benefit
imfstc	Federal sales tax credit
imheatrl	Federal relief for heating expenses

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<b>txhhexp</b>	Compute and pro-rate household taxes, rent, etc.
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## 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 SHS. The rent and property tax are imputed to heads of census families and census family spouses reporting positive net income.

## CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

CTFAMSNA	SHS->SNA conceptual conversion factor [com]
CTFCID	Federal custom import duties [com]
CTFEXD	Federal excise duties [com]
CTFEXT	Federal excise taxes [com]
CTFGST	Federal GST [com]
CTPGAS	Provincial gasoline tax [com x prov]
CTPRST	Provincial retail sales tax [com x prov]
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

<b>txhstr</b>	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 Tax Credits for Wholly Dependant Children
- calculate and allocate Spouse (or Married) Tax Credit
- calculate Spouse (or Married) Equivalent Tax Credit

- calculate Deductions Transferred from Spouse

### ***Calculate and Allocate 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 amount of the tax credit on behalf of dependants under 18 is calculated by subtracting the amount by which the child's Net Income (imdepni) which exceeds the Turndown Level (YCXMT) from the Maximum Young Child Tax Credit. The maximum child tax credit is dependent upon the number of dependants (YXCM1, for 1 dependant, YXCM2 for 2 dependants and YXCM3 for 3 or more dependants).

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 imicnet receives the full amount of the tax credit for all dependent children (imctxs) 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.

### ***Spouse Tax Credit***

Persons legally married during the taxation year are eligible to claim a non-refundable Spouse Tax Credit. The tax credit amounts to a fixed amount 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.

### **SPSM Implementation**

The Spouse Tax Credit (immartxc) amounts to a fixed value (MXM) reduced by the amount of the spouse's Net Income (imdepni) exceeding the reduction level (MXMT). 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.

### ***Equivalent-to- 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 Equivalent-to-Spouse Tax Credit, amounting to a fixed value reduced by a proportion of the relative's net income exceeding a reduction level.

### **SPSM Implementation**

The SPSM calculates the Equivalent-to-Spouse Tax Credit on behalf of dependant children, not other relatives who may be eligible. 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 (imicnet) is claimed.

The credit is calculated as a fixed amount (EMXM) reduced by the amount of the dependant's Net Income (imdepmi) exceeding the reduction level (EMXMT). 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 is subtracted from the total Wholly Dependant Child Tax Credit and the total number of children claimed 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 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**

<b>Function</b>	<b>Description</b>
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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
CTCAMTPC	Child Tax Credit amount per child
EMXM	Married equivalent exemption/amount
EMXMEXT	Married equivalent amount extra top-up
EMXMT	Married equivalent exemption/amount turndown level
EMXMTEXT	Married equivalent amount turndown level extra top-up
FNTCR	Federal non-refundable tax credit rate
MXM	Married exemption/amount
MXMEXT	Married amount extra top-up
MXMT	Married exemption/amount turndown level
MXMTEXT	Married amount turndown level extra top-up
YCXM1	Dependent child amount (1st child)
YCXM2	Dependent child amount (2nd child)
YCXM3	Dependent child amount (3rd ,etc.)
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
imicnet	Net Income (line 236)

#### OUTPUT VARIABLES:

imbtcs	Basic personal tax credit supplement
imcchc	Child's non-refundable credit
imcemc	Child's equivalent to married credit
imchclm	Number of dependent children claimed
imchdtxc	Non-refundable Child Tax Credit
imctxcs	Dependent children tax credits
imdepmi	Dependant's net income
immartxc	Married tax credit claimed

## 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.

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

### *Splitting of pension income*

When SPLTPNSFLAG is turned on, pension income can be split between spouses. See SPLTPNSFLAG for more details

### *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 ididiv. The taxable amount (imidivt) which is added to total income is calculated by multiplying ididiv 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
idise:	Self-employment Earnings, optionally scaled by the parameter FACTISENF
idiinvnd	Interest and Other Investment Income
iditrsp:	Taxable RRSP Withdrawals
idicqp:	CPP/QPP Benefits Received
idialimo:	Alimony and Support Payments Received
imipnst:	Taxable pension Income

iditoh:	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



### ***Calculate CPP/QPP Contribution 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 twice the rate of employees.

Although employees have their CPP/QPP contribution deducted from their paycheque, 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 (idise) 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 CPP/QPP Contribution tax credit (imcppctc) is calculated as a proportion (FNTCR) of the total contributions (imcqppc). 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 imdedft. 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 paycheque 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 average weekly earnings are less than  $UIMINPCT * UIERNMAX$ , no UI contributions are made. 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 (UIERNMAX), multiplied by the number of weeks worked.

The UI Contribution Tax Credit (imuictc) is calculated as a proportion (FNTCR) 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***

Tuition fees paid to an educational institution may be claimed as a tax credit by the student or may be transferred to a spouse or supporting parent.

### **SPSM Implementation**

A value for Tuition Deduction Allowed in the base year (idtuin) exists on the database. This value is imputed from income tax records (see the *Database Creation Guide*). To calculate the Tuition Tax Credit, idtuin, is multiplied by the Federal Non-Refundable Tax Credit Rate FNTCR 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)
imcppse:	optionally, CPP/QPP Contributions deduction for self-employed
idexplor:	Exploration Expenses
imalexp:	Other Employment Allowable Expenses
iddalimo:	Alimony Allowance Paid Out
idmovexp:	Moving Expenses
imccea:	optionally, Child Care Expense Deduction Allowed (calculated separately in function txcea)
idclergy:	Clergy residential deduction

The tax form concept of net income (imicnet) is calculated as Total Income (imictot) minus all deductions from total income (imdedft).

## CROSS REFERENCE

Function	Description
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### INPUT PARAMETERS:

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
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
DIVPLC	Percentage of dividends from large (eligible) corporations

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
FDGURLC	Federal dividend gross-up rate from large (eligible) corporations
FNTCR	Federal non-refundable tax credit rate
NETOASFLG	Net the clawback from Old Age Security
OASRR	OAS reduction rate
OASTD	OAS turndown income
QPIPEMAX	Quebec parental insurance plan maximum insurable earnings
QPIPEMIN	Quebec parental insurance plan minimum insurable earnings
QPIPF	Quebec parental insurance plan contribution rate for paid workers
QPIPFLAG	Quebec parental insurance plan activation flag
QPIPFSE	Quebec parental insurance plan contribution rate for self-employed
QUIPF	Quebec EI contribution rate
REPNETFLAG	Social program repayments reduce net income flag
SECF	CPP/QPP contribution rate on self-employment earnings
SPLTPNSFLAG	Flag to split pension income
TARGETYEAR	Year of analysis
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)
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)
UIEIREFTK	EI contribution refund take up
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:

cfin	First person in census family [pointer]
cfnpers	Number of persons in census family
cfspoflg	Census family contains married couple
hdprov	Province
hhncf	Number of census families in household
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)
idcfrh	Relationship to census family head
idclergy	Clergy residential deduction
iddalimo	Alimony paid (220)
iddues	Union and professional dues (212)
idexplor	Exploration and development expenses (224)
idialimo	Alimony income received
idicapg	Capital gains (actual)
idicqp	CPP/QPP income (114)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiinvnd	Interest and other investment income
idiloss	Business investment losses (217)
idipens	Pension income (115)
idise	Self-employed income
iditoth	Other taxable income (130)
iditrresp	Taxable RRSP withdrawals
idiworkc	Workers compensation benefits
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
imbcss	British Columbia Seniors Supplement
imigis	GIS benefits
imiotg	Other taxable demogrants
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance

imiuib	Unemployment Insurance/Employment Insurance
benefits	
impnsp	Pension income split for head
impnsp	Pension income split for spouse
imqipcbn	Quebec parental insurance plan calendar year
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
ubeiwb	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
imcqpcc	CPP/QPP contributions
imdedft	Deductions from total income
imfar	Family allowance recovery
imicapgt	Capital gains (taxable)
imicnet	Net Income (line 236)
imictot	Total Income (line 150)
imidivt	Dividend income (taxable)
imildivt	Dividend income from large (eligible)
corporations	(taxable)
imiloss	Modelled Business investment losses (217)
iminet	Net income
imioas	OAS benefits
imipnst	Taxable pension income (after splitting)
imisdivt	Dividend income from small corporations (taxable)
imitot	Total income
imnfach	Number of family allowance children claimed
imoasr	OAS recovery
impentr	Pension income transferred from spouse
impentrd	Pension income deduction from transfer to spouse
imqippp	Quebec parental insurance plan premiums for paid
workers	
imqipppse	Quebec parental insurance plan premiums for self-
employed	
imqpiptc	Quebec parental insurance plan premium tax credit
for paid workers	(federal)
imqpsedd	Quebec parental insurance plan premium deduction
for self-employed	(federal)

imqpsetc	Quebec parental insurance plan premium tax credit for self-employed (federal)
imqtfa	Quebec taxable family allowances
imrepay	Social Benefits Repayments
imtfa	Taxable family allowances
imtutxc	Tuition tax credit
imuccb	Universal Child Care Benefit amount
imuibr	UI benefit recovery
imuic	UIC contributions
imuicrf	UI EI contribution refund
imuictc	UIC contributions tax credit

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**txitax**                      Compute taxable income and individual credits

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## SUMMARY

The process of computing taxable income is divided into two separate routines. Deductions and tax credits which are not dependent upon information from other members of the family (e.g., 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 Tax Credit
- Age Tax Credit
- Pension Income Deduction
- Medical Expense Tax Credit, Charitable Donations Tax Credit
- Disability Tax Credit
- Education Tax Credit
- Capital Gains Deduction
- UI Benefit Repayment Payable
- Family Allowance and OAS Repayment Payable (optional)
- Employee Home Relocation Loan Deduction
- Stock Option Deduction

### ***Basic Personal Tax Credit***

The non-refundable Basic Personal Tax Credit is calculated by assigning the value of the parameter BXM (Basic Personal Tax Credit) to the variable imbtc (Modeled Basic Personal Tax Credit) which is applied to reduce Basic Federal Tax in the function txcalc.

### ***Age Tax Credit***

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.

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

### ***Pension Income Tax Credit***

Certain pension income from a pension plan or upon the death of a spouse qualifies for a Pension Income Tax Credit. 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 Modeled Pension Income Tax Credit (impentxc) is assigned the minimum of:

- a) qualified pension income (imipnst) and
- b) the Maximum Allowable Tax Credit (YPNDL),  
times the Tax Credit Rate (FNTCR).

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.

### ***Medical Expense Tax Credit***

The filer is allowed a non-refundable tax credit for certain medical expenses paid on behalf of the filer, spouse or dependants. All medical expenses claimed require supporting proof to be allowed as a tax credit and only medical expenses in excess of 3% of net income are claimable.

### **SPSM Implementation**

The value of Medical Expenses Allowed (immeda) is calculated as the value of the gross medical expenses from the database (idmedgro) less either MEDANF percent of net income or MEDALL, whichever is less. The Medical Expense Tax Credit (immedatc) is calculated as a proportion (FNTCR) of the value of Medical Expenses Allowed (immeda). The Medical Expense Tax Credit is applied to reduce Basic Federal Tax in the function txcalc.

Although medical expenses paid on behalf of dependants are claimable by either spouse, no transfers between spouses are made for this tax credit.

### ***Charitable Donations Tax Credit***

The filer is allowed a non-refundable tax credit on behalf of charitable donations and gifts to Canada or a province. SPSM Implementation

The database contains a value for gross charitable donations (idcharit). The allowable charitable donations (imchara) are calculated as the lesser of idcharit and CHATNF percent of net income. The value of gifts or donations to Canada, a province, or a cultural institution, are then added to imchara.

A two-tier, non-refundable Charitable Donation Tax Credit (imchartc) is calculated. Allowable Donations (imchara) 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 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 Tax Credit. SPSM Implementation

The Disability Tax Credit (imdisatc) is assigned the value of the parameter MAXDX (Maximum Disability Tax Credit) for filers with reported disability amounts for self (iddisslf) or other dependents (iddisoht). 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 Tax Credit***

The Education Tax Credit represents the amount that students with full-time attendance at a designated post-secondary institution may claim. The number of eligible months is multiplied by a maximum allowable amount per month. The filer may transfer to a spouse, parent or grandparent the part of the education tax credit that is not needed to reduce the federal income tax to zero.

### **SPSM Implementation**

The Education Tax Credit (imedtxc) is calculated as the number of eligible full-time months of education amount (ideducfm) multiplied by the Education Tax Credit per full-time month (EDXPM) plus the number of eligible months of part-time education (ideducpm) multiplied by the Education Tax Credit per part-time month (EDXPMPT). 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 (idcloss)
  - 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:

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
BXMEXT	Basic personal amount extra top-up
CAPGIR	Capital gains inclusion rate
CGTC	Caregiver Tax Credit
CGTCFLG	Caregiver Tax Credit activation flag
CGTCOPT	Caregiver Tax Credit option (1=max, 2=greenbook, 3=model)
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
EDDISPT	Part time students with disabilities flag
EDXPM	Education amount per month of full-time studies
EDXPMPT	Education amount per month of part-time studies
EMPTXC	Canada Employment Credit
FNTCR	Federal non-refundable tax credit rate
INTSLFLG	Interest on Student Loans Tax Credit Activation Flag
MAXDX	Maximum disability deduction/amount
MEDALL	Medical allowance maximum lower limit
MEDANF	Medical allowance lower limit net income fraction

ODISTC	Maximum infirm dependent 18 or older tax credit
REPNETFLAG	Social program repayments reduce net income flag
TEXTPMFT	Textbook amount per month of full-time studies
TEXTPMPT	Textbook amount per month of part-time studies
YPNDL	Maximum pension income deduction/amount

#### INPUT VARIABLES:

hhnin	Number of individuals in household
idadded	Additional deductions from net income (256)
idage	Age
idcapgex	Capital gains exemptions (254)
idcgtc	Caregivers tax credit (database) (315)
idcharit	Charitable donations
idclos	Allowable other years capital loss (253)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idemplo	Employee home relocation loan dedn (248)
idgifts	Gifts to Canada/provinces/culture (342)
idiemp	Wages & salaries
idintstu	Interest paid on student loans (319)
idiworkc	Workers compensation benefits
idmedgro	Medical expenses, gross (330)
idnclos	Allowable other years non-capital loss (252)
idnorth	Northern deductions (255)
idothpe	Amounts for Infirm Dependents (306)
idpartlo	Limited partnership losses (251)
idstkded	Stock option deduction (249)
imbcss	British Columbia Seniors Supplement
imicapgt	Capital gains (taxable)
imicnet	Net Income (line 236)
imigis	GIS benefits
imipnst	Taxable pension income (after splitting)
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imrepay	Social Benefits Repayments

#### OUTPUT VARIABLES:

imatxc	Age tax credit
imbtc	Basic personal tax credit
imcapgex	Modelled capital gains deduction (254)
imcgtc	Caregiver Tax Credit Level
imchara	Allowable charitable donations and gifts
(calculated)	
imchartc	Charitable donations tax credit
imdedfn	All deductions from net income

imdisatc	Disability tax credit
imedtxc	Education allowance tax credit
imemptxc	Canada Employment Credit
imintsl	Federal interest on student loans tax credit
imitax	Taxable income
immeda	Medical expenses allowed (computed)
immedatc	Medical expenses allowed tax credit
imothpe	Other dependant tax credit (306)
impentxc	Pension income tax credit
imstkded	Modelled Stock option deduction (249)
imtxttxc	Federal textbook tax credit

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## **txman**      Compute provincial taxes for Manitoba

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### **SUMMARY**

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

The Manitoba 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 (MPNTR) 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)
impmartc	Married and equivalent-to-married tax credit	(MMXM, MMXMT, MEMXM, MEMXMT)
impcgtc	Caregiver tax credit	(MCGTC, MCGTCFLG)
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 refundable learning tax credit (immanltc) is equal to MANLTCF times (the tuition amount (idtuitn) plus the education amount ((ideducfm \* EDXPM) + (ideducpm \* EDXPMPT)) 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). Beginning 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:

CTCINC	Refundable CTC family income scaling factor
EDXPM	Education amount per month of full-time studies
EDXPMPT	Education amount per month of part-time studies
FCBENCAL	Calculate child benefits for calendar year flag
MAMTFTCFLG	Man. amt flag for provincial foreign tax credit
MAMTOPT	Man. alternative minimum tax option
MAMTPCTF	Man. amt rate as pct of additional fed tax due to minimum tax

MAMTPCTM	Man. amt rate as pct of federal minimum tax amount
MAMTTX	Man. amt rate as tax on adjusted income
MANLTCF	Manitoba learning tax credit factor
MANLTMAX	Manitoba learning tax credit maximum amount per student
MAXM	Man. Age Amount
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
MCBAMT	Manitoba child benefit amount per child
MCBAMTP	Manitoba child benefit amount per child for 1st half of year
MCBFLAG	Manitoba child benefit activation flag
MCBPI	Manitoba Child benefit phase-in rate
MCBPIP	Manitoba Child benefit phase-in rate for calendar year
MCBRR1	Manitoba Child benefit reduction rate for 1 child
MCBRR1P	Manitoba Child benefit reduction rate for 1 child for 1st half of year
MCBRR2	Manitoba Child benefit reduction rate for 2 children
MCBRR2P	Manitoba Child benefit reduction rate for 2 children for 1st half of year
MCBRR3	Manitoba Child benefit reduction rate for 3+ children
MCBRR3P	Manitoba Child benefit reduction rate for 3+ children for 1st half of year
MCBTD	Manitoba child benefit turndown
MCBTDP	Manitoba child benefit turndown for 1st half of year
MCBXM	Manitoba cost-of-living basic credit
MCDISEX	Manitoba cost-of-living disability credit
MCEMXM	Manitoba cost-of-living married equivalent credit
MCFINCRR	Manitoba cost-of-living family income reduction rate
MCGTC	Man. Caregiver Tax Credit
MCGTCFLG	Man. Caregiver Tax Credit activation flag
MCGTCOPT	Man. Caregiver Tax Credit Option (1=max, 2=greenbook, 3=model)
MCGTCTD	Man. Caregiver Tax Credit income turndown
MCHATL1	Man. Charitable Donations amount level 1
MCHATR1	Man. Charitable Donations tax credit rate 1
MCHATR2	Man. Charitable Donations tax credit rate 2
MCMINAGE	Manitoba cost-of-living tax credit minimum age
MCMXM	Manitoba cost-of-living married credit

MCODISEX	Manitoba cost-of-living old disabled dependant credit
MCSAXM	Manitoba cost-of-living spouse age credit
MCSDISEX	Manitoba cost-of-living spouse disabled credit
MCYCXM	Manitoba cost-of-living young dependants credit
MDTCR	Man. dividend tax credit rate
MDTCRLC	Man. dividend tax credit rate from large (eligible) corporations
MEDXPM	Man. Education Amount per month of full-time studies
MEDXPMPT	Man. Education Amount per month of part-time studies
MEMXM	Man. equivalent to married amount
MEMXMT	Man. equivalent to married turndown level
MFTBAGE	Man. Family Tax Benefit age amount
MFTBDIS	Man. Family Tax Benefit amount for disability for self or spouse
MFTBFLAG	Man. Family Tax Benefit activation flag
MFTBIOS	Man. Family Tax Benefit net income offset
MFTBKID	Man. Family Tax Benefit amount for kids
MFTBODIS	Man. Family Tax Benefit amount for older infirm dependents
MFTBSAGE	Man. Family Tax Benefit age amount for spouse
MFTBSELF	Man. Family Tax Benefit amount for self
MFTBSP	Man. Family Tax Benefit amount for spouse or equivalent to spouse
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
MMEDALL	Man. Medical allowance maximum lower limit
MMEDANF	Man. Medical allowance lower limit net income fraction
MMXM	Man. married amount
MMXMT	Man. married amount turndown level
MNITR	Manitoba net income tax rate
MODISTC	Man. Maximum infirm dependent 18 or older tax credit
MPAXM	Manitoba property tax credit senior citizen credit
MPBXM	Manitoba property tax credit basic credit

MPFINCRR	Manitoba property tax credit family income reduction rate
MPMINC	Manitoba property tax credit minimum credit
MPMNTH	Manitoba property tax minimum threshold
MPNTPCR	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
MSYCXM	Manitoba surtax young dependants credit
MTRNIO	Manitoba tax reduction net income offset
MTXFLG	Man. tax on taxable income activation flag
MYPNDL	Man. Pension Income Deduction Amount
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior
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]
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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idhomstu	College res/resdnt homeowner assist (558)
ididiv	Dividend income (actual)
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)
idiworkc	Workers compensation benefits
idlabtsg	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idmschpd	Manitoba school taxes paid
idothpe	Amounts for Infirm Dependants (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)
idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
minimum tax	
imatxc	Age tax credit
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts
(calculated)	
imcppse	CPP contributions deduction for self-emp
imcqppe	CPP/QPP contributions
imdedfn	All deductions from net income
imdepni	Dependant's net income



imedrcv	Education and tuition transferred from others
imedtrf	Education and tuition transferred to others
imfcben	Total Federal Child Benefits
imicnet	Net Income (line 236)
imigis	GIS benefits
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisa	Social assistance (or replacement program)
imisdivt	Dividend income from small corporations (taxable)
imispa	Spouse's allowance
imitax	Taxable income
immartxc	Married tax credit claimed
imminamt	Minimum Amount due to Federal Minimum Tax
improptx	Imputed property tax paid
imrentpd	Imputed rent paid
imstxcrt	Tax credits transferred from spouse
imuccb	Universal Child Care Benefit amount
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
immcb	Manitoba Child Benefit
immftb	Manitoba Family Tax Benefit
immhmas	Manitoba Homeowners Assistance
immndc	Manitoba number of dependent children 18 or
younger	
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	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit

impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impnit	Provincial net income tax
impothpe	Provincial infirm dependents 18 or older tax
credit	
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
impttxct	Prov total tax credits transferred
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

**txnb** Compute provincial taxes for New Brunswick

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## 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)
impmartc	Married and equivalent-to-married tax credit	(BMXM, BMXMT, BEMXM, BEMXMT)
impcgtc	Caregiver tax credit	(BCGTC, BCGTCFLG)
impchrctc	Charitable donations	(BCHATL1, BCHATR1, BCHATR2)

impcppte	CPP/QPP contribution	
impdistc	Disability tax credit	(BMAXDX)
impdtxc	Dividend tax credit	(BDTCR)
impdtxc	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  
BAMTPCTF N.B. amt rate as pct of additional fed tax due to minimum tax

BAMTPCTM	N.B. amt rate as pct of federal minimum tax amount
BAMTTX	N.B. amt rate as tax on adjusted income
BAXM	N.B. Age Amount
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
BCGTCOPT	N.B. Caregiver Tax Credit Option (1=max, 2=greenbook, 3=model)
BCGTCTD	N.B. Caregiver Tax Credit income turndown
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
BDTCR	N.B. dividend tax credit rate
BDTCRLC	N.B. dividend tax credit rate from large (eligible) corporations
BEDXPM	N.B. Education Amount per month of full-time studies
BEDXPMPT	N.B. Education Amount per month of part-time studies
BEMXM	N.B. equivalent to married amount
BEMXMT	N.B. equivalent to married turndown level
BHEAPFLG	New Brunswick Home Energy Assistance Program activation flag
BHEATBEN	New Brunswick Home Heating Benefit [income, benefit]
BHEATFLG	New Brunswick Home Heating Benefit activation flag
BHEATPO	New Brunswick Home Heating Benefit family income phase out
BHEATSA	New Brunswick Home Heating Benefit for SA recipients flag
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
BMEDALL	N.B. Medical allowance maximum lower limit
BMEDANF	N.B. Medical allowance lower limit net income fraction
BMXM	N.B. married amount
BMXMT	N.B. married amount turndown level

BODISTC	N.B. Maximum infirm dependent 18 or older tax credit
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
BTRBAS	Base N.B. low income tax reduction
BTRRR	N.B. low income tax reduction Reduction Rate
BTRSP	N.B. low income tax reduction for spouse or equivalent-to-spouse
BTRTD	N.B. low income tax reduction Turndown
BTXFLG	N.B. tax on taxable income activation flag
BYPNDL	N.B. Pension Income Deduction Amount
CTCINC	Refundable CTC family income scaling factor
FCBENCAL	Calculate child benefits for calendar year flag
NBCBBAS	NB Basic child benefit (per child)
NBCBBASP	NB Basic child benefit (per child) for 1st half of year
NBCBECI	NB Child benefits earning supplement cut-in level
NBCBECIP	NB Child benefits earning supplement cut-in level for 1st half of year
NBCBEIS	NB Child benefits earned income supplement
NBCBEISP	NB Child benefits earned income supplement for 1st half of year
NBCBERR	NB Child benefits earning supplement reduction rate
NBCBERRP	NB Child benefits earning supplement reduction rate for 1st half of year
NBCBESR	NB Child benefits earned income supplement rate
NBCBESRP	NB Child benefits earned income supplement rate for 1st half of year
NBCBETD	NB Child benefits earning supplement turndown level
NBCBETDP	NB Child benefits earning supplement turndown level for 1st half of year
NBCBPI	NB Child benefits phase-in rate
NBCBPI1P	NB Child benefits phase-in rate for 1st half of year
NBCBPI2P	NB Child benefits phase-in rate for 2nd half of year

NBCBRR	NB Multi-children family income reduction rate
NBCBRRP	NB Multi-children family income reduction rate for 1st half of year
NBCBRRS	NB Single-child family income reduction rate
NBCBRRSP	NB Single-child family income reduction rate for 1st half of year
NBCBTD	NB child benefits family income turndown
NBCBTDP	NB child benefits family income turndown for 1st half of year
NBCTBFLG	NB child benefit activation flag
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior

#### 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
fxio	I/O expenditure categories [array]
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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)
idise	Self-employed income
idlbtngx	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idothpe	Amounts for Infirm Dependants (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpol	Provincial political contributions (565)

idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
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
imicnet	Net Income (line 236)
imictot	Total Income (line 150)
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisa	Social assistance (or replacement program)
imisdivt	Dividend income from small corporations (taxable)
imitax	Taxable income
imminamt	Minimum Amount due to Federal Minimum Tax
imucb	Universal Child Care Benefit amount
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
imnbcbb	NB child tax Benefits base amount
imnbcben	Total NB child tax Benefits
imnbwis	NB child tax Benefits WIS
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	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impheatr	Provincial Home Heating Fuel/Energy Rebate
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impothpe	Provincial infirm dependents 18 or older 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 transferred
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
imtxp	Provincial income tax payable

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**txnfld**      Compute provincial taxes for Newfoundland

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## 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)
impmartc	Married and equivalent-to-married tax credit	(NMXM, NMXMT,



		NEMXM, NEMXMT)
impcgtc	Caregiver tax credit	(NCGTC, NCGTCFLG)
impchrct	Charitable donations	(NCHATL1, NCHATR1, NCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(NMAXDX)
impdtxc	Dividend tax credit	(NDTCR)
impdtxc	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 :

CTCINC	Refundable CTC family income scaling factor
FCBENCAL	Calculate child benefits for calendar year flag
NAMTOPT	NFLD alternative minimum tax option
NAMTPCTF	NFLD amt rate as pct of additional fed tax due to
minimum tax	
NAMTPCTM	NFLD amt rate as pct of federal minimum tax
amount	
NAMTTX	NFLD amt rate as tax on adjusted income
NAXM	NFLD Age Amount
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
NCB1P	Nfld. child benefit for first child for 1st half
of year	
NCB2	Nfld. child benefit for second child
NCB2P	Nfld. child benefit for second child for 1st half
of year	
NCB3	Nfld. child benefit for third child
NCB3P	Nfld. child benefit for third child for 1st half
of year	
NCB4	Nfld. child benefit for 4th and subsequent child
NCB4P	Nfld. child benefit for 4th and subsequent child
for 1st half of year	
NCBFLG	Newfoundland child benefit activation flag
NCBPO	Nfld. child benefit family income phase out
NCBPOP	Nfld. child benefit family income phase out for
1st half of year	
NCBTD	Nfld. child benefit family income turndown
NCBTDP	Nfld. child benefit family income turndown for
1st half of year	
NCGTC	NFLD Caregiver Tax Credit
NCGTCFLG	NFLD Caregiver Tax Credit activation flag
NCGTCOPT	NFLD Caregiver Tax Credit Option (1=max,
2=greenbook, 3=model)	
NCGTCTD	NFLD Caregiver Tax Credit income turndown
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
NDTCRLC	NFLD dividend tax credit rate from large
(eligible) corporations	
NEDXPM	NFLD Education Amount per month of full-time
studies	
NEDXPMPT	NFLD Education Amount per month of part-time
studies	
NEMXM	NFLD equivalent to married amount

NEMXMT	NFLD equivalent to married turndown level
NHEATERB	Newfoundland electricity rebate amount
NHEATERR	Newfoundland electricity rebate reduction rate
NHEATFLG	Newfoundland home heating fuel rebate activation flag
NHEATINC	Newfoundland home heating fuel rebate - income test flag
NHEATMIN	Newfoundland home heating fuel rebate minimum
NHEATPO	Newfoundland home heating fuel rebate family income phase out
NHEATREB	Newfoundland home heating fuel rebate amount
NHEATRR	Newfoundland home heating fuel rebate reduction rate
NHEATSAFLG	Newfoundland home heating fuel rebate - SA recipients eligible
NHEATTD	Newfoundland home heating fuel rebate family income turndown
NHEATTU	Newfoundland home heating fuel rebate take up
NLITRF	NFLD low income tax reduction family maximum
NLITRFIT	NFLD low income tax reduction family income threshold
NLITRRR	NFLD low income tax reduction credit reduction rate
NLITRS	NFLD low income tax reduction single maximum
NLITRSIT	NFLD low income tax reduction single income threshold
NLVCMAX	Maximum NFLD labour-sponsored funds tax credit allowed
NLVCRT	Percent of NFLD labour-sponsored funds cost allowed as credit
NMAXDX	NFLD Maximum Disability deduction/amount
NMAXET	NFLD maximum on transfer of education and tuition amount
NMBNS	Nfld. Mother-Baby Nutrition Supplement
NMBNSEXT	Nfld. Mother-Baby Nutrition Supplement newborn extra benefit
NMBNSEXTTP	Nfld. Mother-Baby Nutrition Supplement newborn extra benefit for 1st half of year
NMBNSP	Nfld. Mother-Baby Nutrition Supplement for 1st half of year
NMEDALL	NFLD Medical allowance maximum lower limit
NMEDANF	NFLD Medical allowance lower limit net income fraction
NMXM	NFLD married amount
NMXMT	NFLD married amount turndown level
NODISTC	NFLD Maximum infirm dependent 18 or older tax credit

NPFGB	Newfoundland Progressive Family Growth Benefit
NPFGBTU	Newfoundland Progressive Family Growth Benefit
Take Up	
NPNTCR	NFLD provincial non-refundable tax credit rate
NPSB	Newfoundland Parental Support Benefit
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
NSCI2	Newfoundland provincial surtax level 2
NSF	Newfoundland provincial surtax rate
NSF2	Newfoundland provincial surtax rate 2
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
NTXFLG	NFLD tax on taxable income activation flag
NYPNDL	NFLD Pension Income Deduction Amount
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior

#### INPUT VARIABLES:

cfageeld	Age of eldest in census family
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
fxio	I/O expenditure categories [array]
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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)

iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
ididiv	Dividend income (actual)
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)
idlabtxg	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idothpe	Amounts for Infirm Dependants (306)
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)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
minimum tax	
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts
(calculated)	
imcppse	CPP contributions deduction for self-emp
imcqppc	CPP/QPP contributions
imdedfn	All deductions from net income
imdepmi	Dependant's net income
imicnet	Net Income (line 236)
imigist	GIS provincial top-up
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisa	Social assistance (or replacement program)
imisdivt	Dividend income from small corporations (taxable)
imitax	Taxable income
immartxc	Married tax credit claimed
imminamt	Minimum Amount due to Federal Minimum Tax
imucb	Universal Child Care Benefit amount
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
nfspoflg	Nuclear family contains married couple

# OUTPUT VARIABLES:

imbpt	Basic provincial tax
imnncb	Newfoundland Child Benefit
imnmbns	Newfoundland Mother-Baby Nutrition Supplement
imnpfgb	Newfoundland Progressive Family Growth Benefit
imnpsb	Newfoundland Parental Support Benefit
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	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impheatr	Provincial Home Heating Fuel/Energy Rebate
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impothpe	Provincial infirm dependents 18 or older 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

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 (VPNTCR) 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)
impmartc	Married and equivalent-to-married tax credit	(VMXM, VMXMT, VEMXM, VEMXMT)
impcgtc	Caregiver tax credit	(VCGTC, VCGTCFLG)
impchrctc	Charitable donations	(VCHATL1, VCHATR1, VCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(VMAXDX)
impdtxc	Dividend tax credit	(VDTCR)
impdtxc	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 is 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 (imicnet) 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.

### ***Nova Scotia Taxpayer Refund***

#### **Program Description**

The taxpayer refund is payable if the person paid NS provincial taxes in the previous two years.

#### **SPSM Implementation**

In the SPSM, the refund, imnstxrf, is payable if the person paid taxes in the current year. The refund amount is NSTXREFAMT and is controlled by the flag NSTXREFFLG.

## CROSS REFERENCE

Function	Description
INPUT PARAMETERS:	
CTCINC	Refundable CTC family income scaling factor
FCBENCAL	Calculate child benefits for calendar year flag
NSTXREFAMT	NS Taxpayer refund amount
NSTXREFFLG	NS Taxpayer refund flag
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior
VAMTOPT	N.S. alternative minimum tax option
VAMTPCTF	N.S. amt rate as pct of additional fed tax due to minimum tax
VAMTPCTM	N.S. amt rate as pct of federal minimum tax amount
VAMTTX	N.S. amt rate as tax on adjusted income
VAXM	N.S. Age Amount
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
VCBBAS1P	NS child benefit for first child for 1st half of year
VCBBAS2	NS child benefit for second child
VCBBAS2P	NS child benefit for second child for 1st half of year
VCBBAS3	NS child benefit for third or additional child
VCBBAS3P	NS child benefit for third or additional child for 1st half of year
VCBFLG	NS child benefit activation flag
VCBPO	NS child benefit family income phase out
VCBPOP	NS child benefit family income phase out for 1st half of year
VCBTD	NS child benefit turndown
VCBTDP	NS child benefit turndown for 1st half of year
VGTC	N.S. Caregiver Tax Credit
VGTCFLG	N.S. Caregiver Tax Credit activation flag
VGTCOPT	N.S. Caregiver Tax Credit Option (1=max, 2=greenbook, 3=model)
VGTCCTD	N.S. Caregiver Tax Credit income turndown
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
VDTCRLC	N.S. dividend tax credit rate from large (eligible) corporations
VEDXPM	N.S. Education Amount per month of full-time studies
VEDXPMPT	N.S. Education Amount per month of part-time studies
VEMXM	N.S. equivalent to married amount
VEMXMT	N.S. equivalent to married turndown level
VHEATERB	Nova Scotia home heating fuel rebate amount for electricity
VHEATFLG	Nova Scotia Home Heating Assistance Rebate activation flag
VHEATFTD	Nova Scotia home heating fuel rebate income turndown for families
VHEATREB	Nova Scotia home heating fuel rebate amount for oil
VHEATSTD	Nova Scotia home heating fuel rebate income turndown for singles
VHEATTU	Nova Scotia home heating fuel rebate take up
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
VMEDALL	N.S. Medical allowance maximum lower limit
VMEDANF	N.S. Medical allowance lower limit net income fraction
VMXM	N.S. married amount
VMXMT	N.S. married amount turndown level
VODISTC	N.S. Maximum infirm dependent 18 or older tax credit
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
VPCTC	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
VYCTCAPM	N.S. Young Child Tax Credit Amount per Month
VYCTCPI	N.S. Young Child Tax Credit Phase in
VYPNDL	N.S. 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
fxio	I/O expenditure categories [array]
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
idcgtc	Caregivers tax credit (database) (315)

iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idestat	Educational status
ididiv	Dividend income (actual)
idintstu	Interest paid on student loans (319)
idlabtsg	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idnfn	Person's nuclear family [pointer]
idothpe	Amounts for Infirm Dependents (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvpcl	Provincial political contributions (565)
idrand	Random numbers [array]
idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
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
imdepni	Dependant's net income
imgisinc	Individual's income for GIS/SPA reduction
imicnet	Net Income (line 236)
imictot	Total Income (line 150)
imigis	GIS benefits
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisa	Social assistance (or replacement program)
imisdivt	Dividend income from small corporations (taxable)
imispa	Spouse's allowance
imitax	Taxable income
immartxc	Married tax credit claimed
imminamt	Minimum Amount due to Federal Minimum Tax
imuccb	Universal Child Care Benefit amount
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
nfnpers	Number of persons in nuclear family
nfspoflg	Nuclear family contains married couple

#### OUTPUT VARIABLES:

idinspo	Person's spouse [pointer]
imbpt	Basic provincial tax
iminsda	NS Direct Assistance Program
imnptc	Non-refundable provincial tax credits
imnscb	Nova Scotia Child Benefit
imnstxrf	Nova Scotia Taxpayer Refund
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgtc	Prov Caregiver Tax Credit Level
impcgtcp	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impdtxc	Prov Education tax credit
impeht	Provincial elderly health tax
impehtc	Provincial elderly health tax credit
impheatr	Provincial Home Heating Fuel/Energy Rebate
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impothpe	Provincial infirm dependents 18 or older 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

impyctxc      Prov Young Child tax credit  
 imtxp          Provincial income tax payable

**txont**              Compute provincial taxes for Ontario

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## 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 (OPNTRC) 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)
impmartc	Married and equivalent-to-married tax credit	(OMXM, OMXMT, OEMXM, OEMXMT)
impcgtc	Caregiver tax credit	(OCGTC, OCGTCFLG)
impchrtc	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)
impuictc	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 OLVCRT 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:	
CAPGIR	Capital gains inclusion rate
EDXPMPT	Education amount per month of part-time studies
FCBENCAL	Calculate child benefits for calendar year flag
OAMTOPT	Ont. alternative minimum tax option
OAMTPCTF	Ont. amt rate as pct of additional fed tax due to minimum tax
OAMTPCTM	Ont. amt rate as pct of federal minimum tax amount
OAMTTX	Ont. amt rate as tax on adjusted income
OAXM	Ont. Age Amount
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
OCBAMT	Ontario Child Benefit amount per child
OCBAMTP	Ontario Child Benefit amount per child for 1st half of year
OCBFLAG	Ontario Child Benefit activation flag
OCBMIN	Ontario Child Benefit minimum benefit
OCBPIP	Ontario Child Benefit flag for 1st half of year
OCBRR	Ontario Child Benefit reduction rate
OCBRRP	Ontario Child Benefit reduction rate for 1st half of year
OCBTD	Ontario Child Benefit family income turndown
OCBTDP	Ontario Child Benefit family income turndown for 1st half of year
OCCEAFLG	Ont. Child Care Expense Credit activation flag
OCCEAPCT	Ont. Child Care Expense Credit qualifying percentage
OCCEAPCTP	Ont. Child Care Expense Credit qualifying percentage for 1st half of year
OCCEARR	Ont. Child Care Expense Credit benefit reduction rate
OCCEARRP	Ont. Child Care Expense Credit benefit reduction rate for 1st half of year
OCCEATD	Ont. Child Care Expense Credit family income turndown
OCCEATDP	Ont. Child Care Expense Credit family income turndown for 1st half of year

OCCEAYNG      Ont. Child Care Expense Credit allowance per  
 child  
 OCCEAYNGP    Ont. Child Care Expense Credit allowance per  
 child for 1st half of year  
 OCCSEXT      Ont. Child Care Supplement One-time payment of  
 extra benefit  
 OCCSOCB      Ont. Child Care Supplement reduced by Ontario  
 Child Benefit flag  
 OCCSPOPYR    Ont. Child Care Supplement phase out year  
 proportion born pre July  
 OCCSPOYR    Ont. Child Care Working Income Supplement phase  
 out year  
 OCGIRFLG    Ont. Capital Gains Inclusion Rate Activation Flag  
 OCGTC        Ont. Caregiver Tax Credit  
 OCGTCFLG    Ont. Caregiver Tax Credit activation flag  
 OCGTCOPT    Ont. Caregiver Tax Credit Option (1=max,  
 2=greenbook, 3=model)  
 OCGTCTD    Ont. Caregiver Tax Credit income turndown  
 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  
 OCWISFLGP   Ont. Child Care Working Income Supplement  
 activation flag for 1st half of year  
 OCWISMIN    Ont. Child Care Working Income Supplement minimum  
 benefit  
 OCWISRR     Ont. Child Care Working Income Supplement Rate  
 [children][rr]  
 OCWISRRP    Ont. Child Care Working Income Supplement Rate  
 [children][rr] for 1st half of year  
 OCWISSP     Ont. Child Care Working Income Supplement maximum  
 benefit for single parents  
 OCWISSPP    Ont. Child Care Working Income Supplement maximum  
 benefit for single parents for 1st half of year  
 OCWISTD     Ont. Child Care Working Income Supplement minimum  
 earnings  
 OCWISTDP    Ont. Child Care Working Income Supplement minimum  
 earnings for 1st half of year  
 ODTCR        Ont. dividend tax credit rate  
 ODTCLC      Ont. dividend tax credit rate from large  
 (eligible) corporations  
 OEDXPM      Ont. Education Amount per month of full-time  
 studies  
 OEDXPMPT    Ont. Education Amount per month of part-time  
 studies  
 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
OFTCOPT	Ontario foreign tax credit application option
OHEATFAM	Ontario Home Electricity Relief amount for families
OHEATFLG	Ontario Home Electricity Relief activation flag
OHEATFTD	Ontario Home Electricity Relief income turndown for families
OHEATMIN	Ontario Home Electricity Relief minimum
OHEATRR	Ontario Home Electricity Relief reduction rate
OHEATSNG	Ontario Home Electricity Relief amount for singles
OHEATSTD	Ontario Home Electricity Relief income turndown for singles
OHPBASE	Ontario Health Premium table [taxable income,premium]
OHPFLAG	Ontario Health Premium activation flag
OHPPI	Ontario Health Premium program phase in
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
OMEDALL	Ont. Medical allowance maximum lower limit
OMEDANF	Ont. Medical allowance lower limit net income fraction
OMXM	Ont. married amount
OMXMT	Ont. married amount turndown level
OODISTC	Ont. Maximum infirm dependent 18 or older tax credit
OPCRA	Ontario property tax college residence amount
OPNTPCR	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
OPSMAX	Ontario property/sales tax credit maximum
OPTC	Ontario political contribution table [total donations,donation allowed]

OPTCBEN	Maximum Ontario political tax credit allowed
OPTCFLAG	Ontario political contribution refundable tax credit flag
OPTF	Ontario provincial tax fraction
OPTX	Ont. tax table [taxable income,basic provincial tax]
OPYTAX	Estimate of previous year's Ontario taxes
OSHPTGAMT	Ont. Senior Homeowners' Property Tax Grant amount
OSHPTGFLG	Ont. Senior Homeowners' Property Tax Grant activation flag
OSHPTGMPT	Ont. Senior Homeowners' Property Tax Grant minimum property tax allowed
OSHPTGPOC	Ont. Senior Homeowners' Property Tax Grant income phase out for senior couples
OSHPTGPOS	Ont. Senior Homeowners' Property Tax Grant income phase out for single seniors
OSHPTGTDC	Ont. Senior Homeowners' Property Tax Grant income turndown for senior couples
OSHPTGTDS	Ont. Senior Homeowners' Property Tax Grant income turndown for single seniors
OSPOCM	Ontario seniors property tax maximum occupancy cost
OSPSMAX	Ontario seniors property/sales tax credit maximum
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
OSTCNIBC	Ontario seniors tax credit net income base amount for couples
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

OTXTGRANT	Ontario Textbook and Technology Grant amount
OYPNDL	Ont. Pension Income Deduction Amount
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior
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]
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
hdageeld	Age of eldest in household
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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
idestat	Educational status
idhomstu	College res/resdnt homeowner assist (558)
idicapg	Capital gains (actual)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiloss	Business investment losses (217)
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)
idise	Self-employed income
idiworkc	Workers compensation benefits
idlabtsg	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idnf	Person's nuclear family [pointer]
idothpe	Amounts for Infirm Dependents (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)

idrand	Random numbers [array]
idschtp	School type
idsex	Sex
idspoflg	Person has spouse
idstkded	Stock option deduction (249)
idtuitn	Tuition fees (320)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
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
imcqppe	CPP/QPP contributions
imdedfn	All deductions from net income
imdedft	Deductions from total income
imdepni	Dependant's net income
imicapgt	Capital gains (taxable)
imicnet	Net Income (line 236)
imictot	Total Income (line 150)
imigis	GIS benefits
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisa	Social assistance (or replacement program)
imisdivt	Dividend income from small corporations (taxable)
imispa	Spouse's allowance
imitax	Taxable income
imminamt	Minimum Amount due to Federal Minimum Tax
improptx	Imputed property tax paid
imrentpd	Imputed rent paid
imuccb	Universal Child Care Benefit amount
imuic	UIC contributions
nfnkids	Number of children in nuclear family

#### OUTPUT VARIABLES:

imbpt	Basic provincial tax
imiotax	Ontario taxable income
imnptc	Non-refundable provincial tax credits
imocb	Ontario Child Benefit
imocbyng	Ontario Child Benefit amount for Child Care
Supplement	dependents
imoccea	Ont. Child Care Exp. credit allowed (Family)
imoccext	Ont. Child Care Supplement one-time extra benefit

imondc	Ontario number of dependent children 18 or
younger	
imonteht	Ontario Employers Heath Tax (Self-employed)
imopstc	Ont. Property and Sales Tax Credit
imoshtg	Ontario Senior Homeowners' Property Tax Grant
imotxdv	Ontario Taxpayer Dividend
imotxtgr	Ontario Textbook and Technology Grant
impatxc	Prov Age amount tax credit
impatxcr	Prov total tax credits applied
impbtc	Prov Basic amount
impcgtc	Prov Caregiver Tax Credit Level
impcgtcp	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impheatr	Provincial Home Heating Fuel/Energy Rebate
imphp	Provincial Health Premium
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impothpe	Provincial infirm dependents 18 or older 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 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)
impmartc	Married and equivalent-to-married tax credit	(PMXM, PMXMT, PEMXM, PEMXMT)
impcgtc	Caregiver tax credit	(PCGTC, PCGTCFLG)
impchrtc	Charitable donations	(PCHATL1, PCHATR1, PCHATR2)
impcpptc	CPP/QPP contribution	
impdistc	Disability tax credit	(PMAXDX)
impdtxc	Dividend tax credit	(PDTCT)
impdtxc	Education tax credit	(PEDXPM, PMAXET)
impmedtc	Medical expenses tax credit	
imppentc	Pension income tax credit	(PYPNDL)
imptutxc	Tuition Tax credit	(PMAXET)
impuictc	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
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### INPUT PARAMETERS:

PAMTOPT	P.E.I. alternative minimum tax option
PAMTPCTF	P.E.I. amt rate as pct of additional fed tax due to minimum tax
PAMTPCTM	P.E.I. amt rate as pct of federal minimum tax amount
PAMTTX	P.E.I. amt rate as tax on adjusted income
PAXM	P.E.I. Age Amount
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
PCGTCOPT	P.E.I. Caregiver Tax Credit Option (1=max, 2=greenbook, 3=model)
PCGTCTD	P.E.I. Caregiver Tax Credit income turndown
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
PDTCRLC	P.E.I. dividend tax credit rate from large (eligible) corporations
PEDXPM	P.E.I. Education Amount per month of full-time studies
PEDXPMPT	P.E.I. Education Amount per month of part-time studies
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
PMEDALL	P.E.I. Medical allowance maximum lower limit
PMEDANF	P.E.I. Medical allowance lower limit net income fraction
PMXM	P.E.I. married amount
PMXMT	P.E.I. married amount turndown level

PODISTC	P.E.I. Maximum infirm dependent 18 or older tax credit
PPNTRC	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
PYCTCAPM	P.E.I. Young Child Tax Credit Amount per Month
PYCTCPI	P.E.I. Young Child Tax Credit Phase in
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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
ididiv	Dividend income (actual)
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)

idlabtxg	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idothpe	Amounts for Infirm Dependants (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtfp	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
minimum tax	
imbft	Basic federal tax
imchara	Allowable charitable donations and gifts
(calculated)	
imcppse	CPP contributions deduction for self-emp
imcqppe	CPP/QPP contributions
imdedfn	All deductions from net income
imdepm	Dependant's net income
imicnet	Net Income (line 236)
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisdivt	Dividend income from small corporations (taxable)
imitax	Taxable income
imminamt	Minimum Amount due to Federal Minimum Tax
imuccb	Universal Child Care Benefit amount
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	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impothpe	Provincial infirm dependents 18 or older 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 transferred
imptutxc	Prov Tuition tax credit
impuictc	Prov UI/EI contributions tax credit
impyctxc	Prov Young Child tax credit
imtxp	Provincial income tax payable

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**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

**txqcalc**            Calculate income tax (Quebec)

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## **SUMMARY**

The txqcalc function calculates Quebec income tax for those individuals affected.

### **SPSM Implementation**

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. Families who receive SA get their credit zeroed out. If QSTREXT is non-zero and the family is received the sales tax refund (or would have received it if they did not receive SA) then QSTREXT is added to the credit.

### **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.

### **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 (idtuitn) 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 the 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 QFATD4KI is increased by QFATD4K 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 grossed up portion of dividends (imqidivt - ididiv), and

. the allowable taxable portion the capital gains (QAMTCAPR).

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 imqsfllg 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
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### INPUT PARAMETERS:

CCEAOAGE	CCEA Maximum eligible age for oldest child
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
QAMTCAPR	Quebec Alternative Minimum Tax Capital inclusion rate
QAMTCBX	Quebec Alternative Minimum Tax Calculate Basic Exemption
QAMTDIV	Quebec Alternative Minimum Tax Taxable Dividend Limit
QAMTNEGTI	Quebec Alternative Minimum Tax Allow Negative Taxable Income
QAMTRITC	Quebec Alternative Minimum Tax Retirement Income Credit Deduction
QAMTRPFLG	RRSP/RPP included in Quebec Alternative Minimum Tax (1=include)
QAMTSTTC	Quebec Alternative Minimum Tax Spouse Transfer of Tax Credits Flag
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
QAWPCR	Quebec Adapted Work Premium for Disabled Credit Rate [family type]
QAWPEIPI	Quebec Adapted Work Premium for Disabled Employment Income Phase In [family type]
QAWPFLAG	Quebec Adapted Work Premium for Disabled refundable tax credit flag
QAWPMAX	Quebec Adapted Work Premium for Disabled Maximum [family type]

QAWPRR	Quebec Adapted Work Premium for Disabled Reduction Rate
QAWPTD	Quebec Adapted Work Premium for Disabled Income Turndown [family type]
QAXM	Quebec age exemption/amount
QBXN	Quebec basic personal exemption/amount
QCAFLAG	Quebec Child Assistance refundable tax credit flag
QCALRFLG	Quebec combined age, living alone retirement credit
QCAMAX	Quebec Child Assistance Maximum [number of children]
QCAMIN	Quebec Child Assistance Minimum [number of children]
QCAPAMTX	QAMTX taxable capital ratio
QCARR	Quebec Child Assistance Reduction Rate
QCASPMAX	Quebec Child Assistance Maximum Single Parent additional credit
QCASPMIN	Quebec Child Assistance Minimum Single Parent additional credit
QCATDC	Quebec Child Assistance Income Turndown for couples
QCATDS	Quebec Child Assistance Income Turndown for single parents
QCCEAOLD	Quebec CCEA old child limit
QCCEAYNG	Quebec CCEA young child limit
QCCEEIFLG	Quebec Refundable CCE EI Benefits in Earned Income flag
QCCEEITST	Quebec Refundable CCE Earned Income Test flag
QCCEOPT	Quebec CCE calculation option [1=deduction,2=refundable credit]
QCCETCR	Refundable CCE credit rate [net income, % cce claimable]
QCMPOPT	Quebec Complementary Credit option
QCRDFLG	Quebec income credit flag [1=if social contribution are deducted]
QDTCR	Quebec dividend tax credit rate
QDTCRLC	Quebec dividend tax credit rate from large (eligible) corporations
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

QESSNEEDS      Quebec essential needs for transfer of parental contributions  
 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  
 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  
 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  
 QHPTCOPT       Quebec Housing Parent Tax Credit Calculation option  
 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

QLAXOLDDEP    Quebec living alone amount if all dependents 18  
 or over  
 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  
 QNORFAMI       Quebec Northern Deductions from Family Tax Credit  
 Income flag  
 QNTCR        Quebec nominal tax credit rate  
 QPCOPT        Quebec political contribution option  
 QPCTR        Quebec political contribution tax rates  
 QPSXM        Quebec post-secondary exemption/amount  
 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  
 QREPFAMI       Quebec repayment of UI/OAS benefits deduct from  
 income flag  
 QRNCGFLG       Quebec Natural Caregivers Tax Credit activation  
 flag  
 QRNCGMR        Quebec Natural Caregivers Tax Credit maximum  
 reduction  
 QRNCGOPT       Quebec Natural Caregivers Tax Credit option  
 (1=max, 2=model)  
 QRNCGTC        Quebec Natural Caregivers Tax Credit  
 QRNCGTCR       Quebec Natural Caregivers Tax Credit rate  
 QRNCGTD        Quebec Natural Caregivers Tax Credit income  
 turndown  
 QRTRFLAG       Quebec real estate rebate activation flag

QSFDED Quebec Simplified Form - additional deductions  
 for net income calculation flag  
 QSFDISFLAG Quebec Simplified Form Disability tax credit  
 inclusion flag  
 QSFMEDFLAG Quebec Simplified Form medical expense tax credit  
 inclusion flag  
 QSFOPT Quebec Simplified Form Option (1=general  
 2=simplified 3=optimized)  
 QSFTC Quebec Simplified Form tax credit  
 QSFTXCR Quebec Simplified Form - transfer unused credits  
 to spouse under either tax system  
 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  
 QSTREXT Quebec sales tax rebate extra amount  
 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  
 QSTRMAGE Quebec sales tax rebate minimum age flag  
 QSTRRR Quebec sales tax rebate reduction rate  
 QSTSCA Quebec Single Tax System Complementary Amount  
 QTPCFLG Quebec transfer of recognized parental  
 contribution to education activation flag  
 QTRBE Quebec Tax Reduction Breakeven  
 QTROPT Quebec Tax Reduction calculation option  
 1=universal 2=income tested  
 QTRP Quebec tax Reduction proportion  
 QTRSAFAM Quebec Social Assistance Included in Family Tax  
 Credit Income flag  
 QTRWCFAM Quebec Workers Compensation Included in Family  
 Tax Credit Income flag  
 QTUIOPT Quebec tuition tax credit option  
 QTUITRFFLG Quebec flag to allow transfer of tuition tax  
 credit to parents  
 QTX Quebec income tax table [taxable income,basic  
 provincial tax]  
 QWPCR Quebec Work Premium Credit Rate [family type]  
 QWPEIPI Quebec Work Premium Employment Income Phase In  
 [family type]  
 QWPFLAG Quebec Work Premium refundable tax credit flag  
 QWPMAX Quebec Work Premium Maximum [family type]  
 QWPRR Quebec Work Premium Reduction Rate  
 QWPTD Quebec Work Premium Income Turndown [family type]  
 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]
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
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
idcgtc	Caregivers tax credit (database) (315)
idclergy	Clergy residential deduction
idcross	Allowable other years capital loss (253)
iddisab	Disability status (age 16+)
ideducfm	Eligible full-time months of education
idemplo	Employee home relocation loan dedn (248)
idexplor	Exploration and development expenses (224)
idicapg	Capital gains (actual)
ididiv	Dividend income (actual)
idiemp	Wages & salaries
idiloss	Business investment losses (217)
idinspo	Person's spouse [pointer]
idise	Self-employed income
idiworkc	Workers compensation benefits
idlabtxg	Gross Labour funds bought (413)
idnorth	Northern deductions (255)
idothpe	Amounts for Infirm Dependents (306)
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
idtuittn	Tuition fees (320)

imigis	GIS benefits
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imiuib	Unemployment Insurance/Employment Insurance
benefits	
improptx	Imputed property tax paid
imqalexp	Quebec allowable employment expenses
imqatc	Quebec age tax credit
imqbtc	Quebec basic tax credit
imqcapgt	Quebec taxable capital gains
imqcapgx	Quebec modelled capital gains deduction (254)
imqcchc	Quebec child's non-refundable credit
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
imqdedfn	Quebec all deductions from net income
imqdedft	Quebec deductions from total income
imqdistc	Quebec disability tax credit
imqduetc	Quebec Dues Tax Credit
imghsfc	Quebec Health Services Fund Contributions
imghsftc	Quebec Health Services Fund Cont.tax credit
imqidivt	Quebec taxable dividends
imqinet	Quebec net income
imqintsl	Quebec student loan interest tax credit
imqipnst	Quebec taxable pension income (after splitting)
imqitax	Quebec taxable income
imqitot	Quebec total income
imqlatc	Quebec living alone tax credit
imqldivt	Quebec taxable dividends from large (eligible)
corporations	
imqmeda	Quebec medical expenses allowed
imqmtc	Quebec married tax credit
imqndc	Quebec number of dependent children
imqpipcbr	Quebec parental insurance plan calendar year
benefits	
imqqpiptc	Quebec parental insurance plan premium tax credit for paid workers (Quebec)
imqqpsedd	Quebec parental insurance plan premium deduction for self-employed (Quebec)
imqqpsetc	Quebec parental insurance plan premium tax credit for self-employed (Quebec)
imqritc	Quebec retirement income tax credit
imqsdivt	Quebec taxable dividends from small corporations
imqsfflg	Quebec simplified tax form flag 0=general
1=simplified	
imqstkdd	Quebec modelled Stock option deduction (249)



imqtuitc	Quebec Tuition Tax Credit
imquictc	Quebec UI contributions tax credit
imrepay	Social Benefits Repayments
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
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
imqamt	Quebec Minimum Tax Amount
imqamtfg	Quebec Minimum Tax flag
imqapf	Quebec Anti-Poverty Fund
imqawrkpr	Quebec Adapted Work Premium for Disabled
refundable tax credit	
imqbtax	Quebec tax before credits
imqca	Quebec Child Assistance refundable tax credit
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
imqctpc	Quebec child's transfer of recognized parental
contribution	
imqdtxc	Quebec dividend tax credit
imgei	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
imqhptcp	Quebec Home Parent Tax Credit potential level
imqidc	Quebec income of designated dependent child
imqittr	Quebec income tested tax reduction
imqmedrc	Quebec refundable tax credit for medical expenses
imqncgtc	Quebec Refundable Natural Caregivers Tax Credit
imqnctcp	Quebec Refundable Natural Caregivers Tax Credit
potential amount	
imqprr	Quebec property tax refund
imqstr	Quebec sales tax refund
imqtca	Quebec tax credits applied
imqtct	Quebec tax credits transferable

imqtctc	Quebec tax credits transferred from child
imqtcts	Quebec tax credits transferred from spouse
imqtottc	Quebec total tax credits
imqtpcn	Quebec number of children who transferred
parental contribution	
imqtuitt	Quebec amount of tuition transferred to parents
imqwrkpr	Quebec Work Premium refundable tax credit
imtxp	Provincial income tax payable

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<b>txqcea</b>	Compute child care expense allowance (Quebec)
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## 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:

CCEAOAGE	CCEA Maximum eligible age for oldest child
CCEATFLG	CCEA eligible->claimable transformation activation flag
CCEATFR	CCEA eligible->claimable fraction
CCEATLL	CCEA eligible->claimable lower limit
QBXMX	Quebec basic personal exemption/amount
QCAFLAG	Quebec Child Assistance refundable tax credit flag
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]
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)
idiemp	Wages & salaries
idise	Self-employed income

#### OUTPUT VARIABLES:

imqccea	Quebec child care expenses allowed (dedn)
imgdedft	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 tax credits for dependent children
- calculate and allocate the married tax credit
- calculate the living alone tax credit

#### ***Calculate and Allocate Dependent Children Tax Credit***

If a spouse is present, the one with the higher Net Income (imqinet) receives the full amount of the tax credit for all dependent children (imgdctc).

#### ***Calculate and Allocate Married Tax Credit***

Persons legally married during the taxation year are eligible to claim a Married Tax Credit amounting to a fixed value reduced by the spouse's adjusted net income.

The Married Tax Credit (imgmtc) is calculated only for the spouse with the lower Net Income (imqinet). It amounts to a fixed value (QMXM) reduced by the other spouse's Net 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**

<b>Function</b>	<b>Description</b>
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INPUT PARAMETERS:

QCAFLAG	Quebec Child Assistance refundable tax credit flag
QCALRFLG	Quebec combined age, living alone retirement credit
QDTCNCA1	Quebec Dependent Tax Credit Amount for first dependent without child assistance
QDTCNCA2	Quebec Dependent Tax Credit Amount for other dependents without child assistance
QDTCSPA	Quebec Dependent Tax Credit Single Parent Amount (no child assistance)
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
QNTCR	Quebec nominal tax credit rate
QODISTC	Quebec infirm dependent amount (18 and over)
QPSXM	Quebec post-secondary exemption/amount
QPSXMINC	Quebec income ratio for post-secondary exemption/amount

QREPFAMI	Quebec repayment of UI/OAS benefits deduct from income flag
QSPBFLAG	Quebec inclusion of social program benefits in income flag
QTPCFLG	Quebec transfer of recognized parental contribution to education activation flag
QYCXM1	Quebec dependent child #1 amount
QYCXM2	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+)
cfnkids	Number of children in census family
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
ideducfm	Eligible full-time months of education
idestat	Educational status
idiworkc	Workers compensation benefits
idothpe	Amounts for Infirm Dependants (306)
idrpp	Registered pension plan contributions (207)
idrrsp	RRSP calculated amount (208)
idschtp	School type
imigis	GIS benefits
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imqcppse	Quebec self-employ. QPP/CPP Cont. deduction
imqinet	Quebec net income
imqitot	Quebec total income
imrepay	Social Benefits Repayments

#### OUTPUT VARIABLES:

imqcchc	Quebec child's non-refundable credit
imqdctc	Quebec dependent child tax credits
imqdepni	Quebec dependant's net income
imqlatc	Quebec living alone tax credit
imqmtc	Quebec married tax credit
imqndc	Quebec number of dependent children

## 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
idise:	Self-employment Earnings, optionally scaled by the parameter FACTISENF
idiinvnd:	Interest Income
imqidivt:	Modeled Taxable Amount of Dividends for Quebec
idicqp:	CPP/QPP Benefits Received
imipnst:	Taxable pension Income
iditrsp:	Pension Income
iditoh:	Other Taxable Income
imiuib:	Modeled Unemployment Insurance Benefits Received
imiotg:	Modeled New Taxable Demogrants
imqtfa:	Quebec Taxable Family Allowances
imioas:	Modeled OAS Benefits
imqcapgt:	Modeled Taxable Capital Gains and Losses for Quebec
idialimo	Alimony Income Received

When QSPBFLAG is assigned to 1, social assistance benefits (imisa), worker's compensation (idiworkc) and net federal supplements (imigis + imispa) are added to total income (imqitot).

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 (imqdedit) 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:

imqempdd	Quebec earned income deduction for workers
idrpp:	Registered Pension Plan Contributions
idrrsp:	Registered Retirement Savings Plan Contributions
iddues:	Union and Professional Dues

idtuitn:	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)
imqccea:	optionally, Child Care Expense Deduction Allowed (calculated separately in function txqccea)
imqdedia:	Employment Expenses
imqalexp:	Other Allowable Employment Expenses

### ***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
DIVPLC	Percentage of dividends from large (eligible) corporations
QALEXP	Quebec proportion of other allowable employment expenses to use



QCAPGIR            Quebec capital gains inclusion rate  
 QCMPOPT           Quebec Complementary Credit option  
 QCPPOPT           Quebec CPP/QPP contribution deduction/credit  
 option [1=deduction,2=credit]  
 QDGUR            Quebec dividend gross-up rate  
 QDGURLC          Quebec dividend gross-up rate from large  
 (eligible) corporations  
 QDTCR            Quebec dividend tax credit rate  
 QDTCRLC          Quebec dividend tax credit rate from large  
 (eligible) corporations  
 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  
 QEMPDEDM        Quebec earned income deduction for workers  
 maximum  
 QEMPDEDP        Quebec earned income deduction percent of income  
 QHSC            Quebec Health Services Fund Contribution table  
 QHSOASFG        Quebec Health Services Fund Contribution OAS  
 Deduction flag  
 QINTSLTC        Quebec student loan interest tax credit 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  
 QNORTHDED       Quebec northern deductions - 0=for taxable  
 income, 1=for net income  
 QNTCR            Quebec nominal tax credit rate  
 QPIPF            Quebec parental insurance plan contribution rate  
 for paid workers  
 QPIPFLAG        Quebec parental insurance plan activation flag  
 QPIPFSE        Quebec parental insurance plan contribution rate  
 for self-employed  
 QREPFAMI        Quebec repayment of UI/OAS benefits deduct from  
 income flag  
 QREPNETFG       Social program repayments reduce Quebec net  
 income flag  
 QRNCGFLG        Quebec Natural Caregivers Tax Credit activation  
 flag  
 QSFDED           Quebec Simplified Form - additional deductions  
 for net income calculation flag

QSFDISFLAG Quebec Simplified Form Disability tax credit inclusion flag  
 QSFMEDFLAG Quebec Simplified Form medical expense 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  
 QSPLTPNSFLAG Quebec flag to split pension income  
 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:

cfin First person in census family [pointer]  
 cfnpers Number of persons in census family  
 cfspoflg Census family contains married couple  
 hhncf Number of census families in household  
 hhnin Number of individuals in household  
 idalexp Other allowable employment expenses (229)  
 idcapgex Capital gains exemptions (254)  
 idcarry Carrying charges (221)  
 idcfrh Relationship to census family head  
 idclergy Clergy residential deduction  
 idcloss 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)  
 idialimo Alimony income received  
 idicapg Capital gains (actual)  
 idicqp CPP/QPP income (114)  
 ididiv Dividend income (actual)  
 idiemp Wages & salaries  
 idiinvnd Interest and other investment income  
 idiloss Business investment losses (217)  
 idinspo Person's spouse [pointer]  
 idintstu Interest paid on student loans (319)

idipens	Pension income (115)
idise	Self-employed income
iditoth	Other taxable income (130)
iditrresp	Taxable RRSP withdrawals
idiworkc	Workers compensation benefits
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)
imcqppc	CPP/QPP contributions
imicnet	Net Income (line 236)
imictot	Total Income (line 150)
imigis	GIS benefits
imioas	OAS benefits
imiotg	Other taxable demogrants
imisa	Social assistance (or replacement program)
imispa	Spouse's allowance
imiuib	Unemployment Insurance/Employment Insurance
benefits	
imoasr	OAS recovery
imqipcbn	Quebec parental insurance plan calendar year
benefits	
imqippp	Quebec parental insurance plan premiums for paid
workers	
imqipppse	Quebec parental insurance plan premiums for self-
employed	
imqpnsp	Quebec pension income split for head
imqpnsp	Quebec pension income split for spouse
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/PPP Cont. deduction
imqcpptc	Quebec CPP/QPP contributions tax credit
imqddea	Quebec employment allowance
imqdedft	Quebec deductions from total income

imqduetc	Quebec Dues Tax Credit
imqempdd	Quebec earned income deduction for workers
imqdivt	Quebec taxable dividends
imqiloss	Quebec Modelled Business investment losses (234)
imqinet	Quebec net income
imqintsl	Quebec student loan interest tax credit
imqipnst	Quebec taxable pension income (after splitting)
imqitot	Quebec total income
imqldivt	Quebec taxable dividends from large (eligible) corporations
imqpentr	Quebec Pension income transferred from spouse
imqpentrd	Quebec Pension income deduction from transfer to spouse
imqqpiptc	Quebec parental insurance plan premium tax credit for paid workers (Quebec)
imqqpsedd	Quebec parental insurance plan premium deduction for self-employed (Quebec)
imqqpsetc	Quebec parental insurance plan premium tax credit for self-employed (Quebec)
imqsdivt	Quebec taxable dividends from small corporations
imqsfflg	Quebec simplified tax form flag 0=general 1=simplified
imqtuitc	Quebec Tuition Tax Credit
imquictc	Quebec UI contributions tax credit

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**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. When the general tax form is used (imqsfflg), all deductions are calculated and allowed (imqdedfn). These deductions are calculated and subtracted from Net Income (imqinet) to derive a tentative value for Taxable Income (imqitax). When the simplified form is used, depending on the year, only certain deductions are allowed.

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.

The function txqitax also calculates tax credits which are applied in txqcalc.

### *Calculate Deductions from Net Income*

The variable `imqdedfn` stores the value of All Deductions from Net Income. It is calculated as the sum of:

```
idcloss      /* allowable other years capital loss */
idnclos      /* allowable prior years non-capital loss */
imqchara     /* charitable contributions & gifts */
idemplo     /* home relocation loan deduction include in other deductions */
idpartlo     /* Limited partnership losses */
imqstkdd     /* stock option deduction as part of other deduction */
idnorth      /* Northern deduction used as designated remote area if
QNORTHDED is set to 0 */
imisa        /* Social assistance or replacement program if QSADED is set to 1 */
imigis       /* Guaranteed income supplement benefits if QNFSDED is set to 1 */
imispa       /* Spouse's allowance if QNFSDED is set to 1 */
idiworkc     /* Worker's Compensation Benefits if QNFSDED is set to 1 */
imqcapgx     /* Quebec modelled capital gains deduction */
```

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, or the Société de placements dans l'entreprise québécoise Deduction.

### ***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
QCAPGIR	Quebec capital gains inclusion rate
QCHATNF	Quebec charitable donations maximum % net income
QEEXPDED	Quebec employment expenses deduction application 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
QHSCFLAG	Quebec Health Services Fund Contribution calculation flag
QHSOASFG	Quebec Health Services Fund Contribution OAS Deduction flag
QHSSFALM	Quebec Health Services Fund Contrib. Alimony Paid Deduction flag
QHSSFCAR	Quebec Health Services Fund Contrib. Carrying Charges Deduction flag
QHSSFLSS	Quebec Health Services Fund Contrib. Allowable Losses Deduction flag
QHSSFUIR	Quebec Health Services Fund Contrib. UI/EI Repayment 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  
 QNORTHDED     Quebec northern deductions - 0=for taxable  
 income, 1=for net income  
 QNTCR          Quebec nominal tax credit rate  
 QREPFAMI       Quebec repayment of UI/OAS benefits deduct from  
 income flag  
 QRNCGFLG       Quebec Natural Caregivers Tax Credit activation  
 flag  
 QSADED        Quebec deduction of social assistance benefits  
 from net income flag  
 QSPBFLAG       Quebec inclusion of social program benefits in  
 income flag  
 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  
 idclergy       Clergy residential deduction  
 idcloss        Allowable other years capital loss (253)  
 iddalimo       Alimony paid (220)  
 iddisoth       Disability amount for dependants (318)  
 iddisself      Disability amount for self (316)  
 idemplo       Employee home relocation loan dedn (248)  
 idgifts        Gifts to Canada/provinces/culture (342)  
 idialimo       Alimony income received  
 ididiv        Dividend income (actual)  
 idiemp        Wages & salaries  
 idinspo        Person's spouse [pointer]  
 idiworkc       Workers compensation benefits  
 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
imoasr	OAS recovery
imqalexp	Quebec allowable employment expenses
imqcapgt	Quebec taxable capital gains
imqcppse	Quebec self-employ. QPP/CPP Cont. deduction
imqdivt	Quebec taxable dividends
imqiloss	Quebec Modelled Business investment losses (234)
imqinet	Quebec net income
imqipnst	Quebec taxable pension income (after splitting)
imqitot	Quebec total income
imqqpsedd	Quebec parental insurance plan premium deduction for self-employed (Quebec)
imqsfflg	Quebec simplified tax form flag 0=general 1=simplified
imrepay	Social Benefits Repayments
imuccb	Universal Child Care Benefit amount
imuibr	UI benefit recovery

#### OUTPUT VARIABLES:

imqatc	Quebec age tax credit
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
imqdistc	Quebec disability tax credit
imqhsfc	Quebec Health Services Fund Contributions
imqhsftc	Quebec Health Services Fund Cont.tax credit
imqitax	Quebec taxable income
imqmeda	Quebec medical expenses allowed
imqritc	Quebec retirement income tax credit
imqstkdd	Quebec modelled Stock option deduction (249)



**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).

**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 (SPNTCR) 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)
impmartc	Married and equivalent-to-married tax credit	(SMXM, SMXMT, SEMXM, SEMXMT)
impcgtc	Caregiver tax credit	(SCGTC, SCGTCFLG)

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 imnfach, 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 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 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	Refundable CTC family income scaling factor
FCBENCAL	Calculate child benefits for calendar year flag
GSTCYFLG	GST credit calendar year calculation activation flag
HEATSNG	Federal relief for heating expenses for singles
PYINC	Deflator to calculate previous year income
PYINCP	Deflator to calculate income from 2 years prior
SAMTOPT	Sask. alternative minimum tax option
SAMTPCTF	Sask. amt rate as pct of additional fed tax due to minimum tax
SAMTPCTM	Sask. amt rate as pct of federal minimum tax amount
SAMTTX	Sask. amt rate as tax on adjusted income

SAXM	Sask. Age Amount
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
SCB1P	Sask Child Benefit max for 1st child for 1st half of year
SCB2	Sask Child Benefit max for 2nd child
SCB2P	Sask Child Benefit max for 2nd child for 1st half of year
SCB3	Sask Child Benefit max for 3rd and additional child
SCB3P	Sask Child Benefit max for 3rd and additional child for 1st half of year
SCBFLG	Sask Child Benefit activation flag
SCBRR1	Sask Child Benefit 1st reduction rate [number of kids]
SCBRR1P	Sask Child Benefit 1st reduction rate [number of kids] for 1st half of year
SCBRR2	Sask Child Benefit 2nd reduction rate [number of kids]
SCBRR2P	Sask Child Benefit 2nd reduction rate [number of kids] for 1st half of year
SCBSPA	Sask Child Benefit Single Parent Amount
SCBSPAP	Sask Child Benefit Single Parent Amount for 1st half of year
SCBTD1	Sask Child Benefit 1st turndown
SCBTD1P	Sask Child Benefit 1st turndown for 1st half of year
SCBTD2	Sask Child Benefit 2nd turndown
SCBTD2P	Sask Child Benefit 2nd turndown for 1st half of year
SCGTC	Sask. Caregiver Tax Credit
SCGTCFLG	Sask. Caregiver Tax Credit activation flag
SCGTCOPT	Sask. Caregiver Tax Credit Option (1=max, 2=greenbook, 3=model)
SCGTCTD	Sask. Caregiver Tax Credit income turndown
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
SDTCRLC	Sask. dividend tax credit rate from large (eligible) corporations

SEDXPM studies	Sask. Education Amount per month of full-time studies
SEDXPMPT studies	Sask. Education Amount per month of part-time studies
SEMXM	Sask. equivalent to married amount
SEMXT	Sask. equivalent to married turndown level
SFTAX income	Saskatchewan provincial flat surtax rate on net income
SHEATFAM	Saskatchewan Home Heating Assistance Rebate for families
SHEATFLG activation flag	Saskatchewan Home Heating Assistance Rebate activation flag
SHEATSNG	Saskatchewan Home Heating Assistance Rebate for singles
SLVCMAX allowed	Maximum Sask. labour-sponsored funds tax credit allowed
SLVCRT allowed as credit	Percent of Sask. labour-sponsored funds cost allowed as credit
SMAXDX	Sask. Maximum Disability deduction/amount
SMAKET tuition amount	Sask. maximum on transfer of education and tuition amount
SMEDALL	Sask. Medical allowance maximum lower limit
SMEDANF fraction	Sask. Medical allowance lower limit net income fraction
SMXM	Sask. married amount
SMXT	Sask. married amount turndown level
SODISTC credit	Sask. Maximum infirm dependent 18 or older tax credit
SPNTR	Sask. provincial non-refundable tax credit rate
SPTC	Saskatchewan political contribution table [total donations,donation allowed]
SPTCBEN	Maximum Saskatchewan political tax credit allowed
SPTF	Saskatchewan provincial tax fraction
SPTX tax]	Sask. tax table [taxable income,basic provincial tax]
SSCI	Saskatchewan surtax cut-in
SSF fraction	Saskatchewan provincial high income surtax fraction
SSSTC	Sask. senior supplement tax credit
SSTC1KIDTD	Sask. sales tax credit child amount turndown if only 1 child
SSTC1KIDTDP	Sask. sales tax credit child amount turndown if only 1 child for 1st half of year
SSTC2KIDTD	Sask. sales tax credit child amount turndown if more than 1 child
SSTC2KIDTDP	Sask. sales tax credit child amount turndown if more than 1 child for 1st half of year

SSTCBAS	Sask. sales tax credit base amount
SSTCBASP	Sask. sales tax credit base amount for 1st half of year
SSTCBASPIR	Sask. sales tax credit base amount phase in rate
SSTCBASPIRP	Sask. sales tax credit base amount phase in rate for 1st half of year
SSTCBASTD	Sask. sales tax credit base amount turndown
SSTCBASTDP	Sask. sales tax credit base amount turndown for 1st half of year
SSTCFLAG	Sask. sales tax credit activation flag
SSTCKID	Sask. sales tax credit child amount
SSTCKIDP	Sask. sales tax credit child amount for 1st half of year
SSTCPI	Sask. sales tax credit phase in
SSTCPI1P	Sask. sales tax credit phase in for 1st half of year
SSTCPI2P	Sask. sales tax credit phase in for 2nd half of year
SSTCRR	Sask. sales tax credit reduction rate
SSTCRRP	Sask. sales tax credit reduction rate for 1st half of year
SSTCSP	Sask. sales tax credit spousal amount
SSTCSPP	Sask. sales tax credit spousal amount for 1st half of year
SSTCSPTD	Sask. sales tax credit spousal amount turndown
SSTCSPTDP	Sask. sales tax credit spousal amount turndown for 1st half of year
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
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]
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
idcgtc	Caregivers tax credit (database) (315)
iddisab	Disability status (age 16+)
iddisoth	Disability amount for dependants (318)
iddisslf	Disability amount for self (316)
ideducfm	Eligible full-time months of education
ideducpm	Eligible part-time months of education
ididiv	Dividend income (actual)
idinspo	Person's spouse [pointer]
idintstu	Interest paid on student loans (319)
idiworkc	Workers compensation benefits
idlabtsg	Gross Labour funds bought (413)
idmedgro	Medical expenses, gross (330)
idmincar	Minimum tax carryover (504)
idothpe	Amounts for Infirm Dependants (306)
idprvftc	Provincial foreign tax credit (Form T2036)
idprvppl	Provincial political contributions (565)
idsex	Sex
idspoflg	Person has spouse
idtuitn	Tuition fees (320)
imamtfg	Minimum tax flag
imamtinc	Net adjusted income used for minimum tax
imamtprv	Federal minimum tax concept used for provincial
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
imdepm	Dependant's net income
imheatrl	Federal relief for heating expenses
imicnet	Net Income (line 236)
imigis	GIS benefits
imildivt	Dividend income from large (eligible)
corporations	(taxable)
iminet	Net income
imipnst	Taxable pension income (after splitting)
imisa	Social assistance (or replacement program)

imisdivt	Dividend income from small corporations (taxable)
imispa	Spouse's allowance
imitax	Taxable income
immartxc	Married tax credit claimed
imminamt	Minimum Amount due to Federal Minimum Tax
imnfach	Number of family allowance children claimed
imuccb	Universal Child Care Benefit amount
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	Provincial Dependent Caregiver Tax Credit Amount
impchrtc	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
impheatr	Provincial Home Heating Fuel/Energy Rebate
impintsl	Provincial interest on student loans tax credit
implvctc	Provincial labour-sponsored funds tax credit
impmartc	Prov Married and Equivalent to Married tax credit
impmeda	Prov Medical expenses allowed (computed)
impmedtc	Prov Medical Expenses tax credit
impminco	Prov Minimum tax carryover
impnit	Provincial net income tax
impothpe	Provincial infirm dependents 18 or older 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
imscb	Saskatchewan Child Benefit
imsctxc	Saskatchewan Non-refundable child tax credit
imssstxc	Saskatchewan senior supplement tax credit
imsstc	Saskatchewan refundable sales tax credit
imtxp	Provincial income tax payable

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## **ui**                      Compute UI benefits

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### **SUMMARY**

Unemployment Insurance (UI) and Employment Insurance (EI) benefits are calculated by a set of functions which mimic application of UI/EI regulations to individual employment and claim histories. These histories are summaries of administrative data from a 10% sample of persons with some UI/EI 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.

### **Program Description**

Unemployment/Employment 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/EI 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/EI regulations to each claim and each UI/EI 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/EI 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 ucbttyp.

The UI/EI algorithm has no behavioural response capacity, so that, for example, no new claims can be created. However, there have been more people with claims imputed in the base year than was necessary. This means that the number of persons with claims can be modified using the UITARGET and UIEITKP parameters. Similarly, the duration of modeled claims does not exceed observed durations, except when the following parameters are used: UIREGWKFCT, UITRNBWKFCT, UIOTHWKFCT, UIEXTMATWKS. Unless these parameters are modified, the assumption is that individuals would not increase their duration 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 uiclm which calculates benefits for a single claim. uiclm does this by first calling a sub-function which test for eligibility requirements based on claim type (uielent). uiclm next calls a sub-function which determines the weeks of entitlement in the Initial Phase (uiwkbas). The ui function then calls uitrncnm which calculates training and other benefits (excluding regular, fishing, sickness, maternity, and parental which are calculated in uiclm). If a second claim is required uiclm and uitrncnm are called again. Each function and sub-function are briefly described below.

### *ui*

The ui function serves to pass information about each individual with a UI/EI claim in a household to uiclm. 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 uiclm when the second claim is processed. UI/EI benefits for a calendar year are returned.

### *uiclm*

The sub-function uiclm processes distinct claims from the information passed to it by ui. In the event of a repeat claim, ui passes information about modeled claim activity in the qualifying period. Modeled changes to UI/EI regulations may produce important differences in first claim activity, thereby effectively changing the status of the second claim.

The uiclm function operates at a claim rather than an individual level. It calls uielent to establish eligibility. It then changes the type of eligible claims, where appropriate.

Once a claim is established, uiclm calls uiwkbas to determine the weeks of entitlement in each of the Initial Phase. 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 (no longer modeled)  
Pointer #3 - 1st week of Regional Extended benefits (no longer modeled)  
Pointer #4 - week after end of Regional Extended Benefits.

Weeks are identified by integers with the week of January 1 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 (minus any training or other weeks) 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.

The uiclm function then calculates the weekly benefits. Benefits are the product of phase weeks times the weekly benefit rate for each phase summed over phases. However, benefit rates may be increased or decreased by the following modelled programs: minimum divisor rule (see UIEIDIVFLG), the intensity rule (see UIEIFIFLG), an enhanced rate should there be dependents (see UIENSRTCO), and the family supplement (see UIEIFSFLG).

### ***uielent***

The uielent sub-function applies eligibility tests based on the minimum weeks or hours 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, new entrants/re-entrants, and other regular claimants. 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 remain maternity, fishing, sickness or parental), 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 or hours of insurable employment in the qualifying period up to a maximum number of weeks.

### ***uitrncml***

The function uitrncml is called by the ui function after the uiclm function. Therefore, regular, sickness, maternity, fishing, and parental benefits have already been assigned. The uitrncml function assigns first other types of benefits, then training benefits. Other types of benefits will include everything not included in regular, sickness, maternity, parental, fishing or training. The list of other benefits included will vary depending on the year of the program. But they may include such items as job creation benefits, work sharing benefits, and self-employed assistance.

Other benefits are calculated using the imputed weeks of other benefits (ucothwk) and a weekly benefit rate (ucothbr). These can be adjusted using UIOTHWKFCT and UIOTHBNFCT. Training benefits are calculated in a similar manner using uctrnwk, uctrnbr, UITRNWKFCT, and UITRNBINFCT. There are no eligibility tests for these types

of benefits. The pointers ubp3 and ubp4 were created to signify the end of these benefit phases.

## CROSS REFERENCE

Function	Description
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INPUT PARAMETERS:

BXM	Basic personal exemption/amount
BXMEXT	Basic personal amount extra top-up
PYINC	Deflator to calculate previous year income
QPIPBMTW	Quebec parental insurance plan maternity weeks benefit rate - basic plan
QPIPBPRR1	Quebec parental insurance plan maximum maternity weeks - basic plan
QPIPBPRR2	Quebec parental insurance plan parental initial weeks benefit rate - basic plan
QPIPBPRW1	Quebec parental insurance plan parental additional weeks benefit rate - basic plan
QPIPBPRW2	Quebec parental insurance plan maximum parental initial weeks - basic plan
QPIPBPTW	Quebec parental insurance plan maximum parental additional weeks - basic plan
QPIPBPTR	Quebec parental insurance plan paternity benefit rate - basic plan
QPIPBPTW	Quebec parental insurance plan maximum paternity weeks - basic plan
QPIPEADJ	Quebec parental insurance plan earnings adjustment
QPIPEMIN	Quebec parental insurance plan minimum insurable earnings
QPIPFLAG	Quebec parental insurance plan activation flag
QPIPSMTR	Quebec parental insurance plan maternity benefit rate - special plan
QPIPSMTW	Quebec parental insurance plan maternity benefit rate - special plan
QPIPSPRR	Quebec parental insurance plan maximum maternity weeks - special plan
QPIPSPRW	Quebec parental insurance plan parental benefit rate - special plan
QPIPSPTR	Quebec parental insurance plan maximum parental weeks - special plan
QPIPSPTR	Quebec parental insurance plan paternity benefit rate - special plan

QPIPSPTW      Quebec parental insurance plan maximum paternity weeks - special plan  
 QPIPTU        Quebec parental insurance plan option take up  
 TARGETYEAR    Year of analysis  
 UIBASFLAG     Basic phase calculation flag (UI and EI)  
 UIBASRATE     Benefit rate for basic phase (UI 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)  
 UIEIDIVFLG    EI minimum divisor flag (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)  
 UIEIMFSP      EI Maximum family supplement percent of earnings (EI only)  
 UIEIMTYPFLG   Flag to model main benefit type (UI and EI)  
 UIEINEREF LG   Flag to check for hours for new entrants and re-entrants (EI only)  
 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  
 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)
UILFERATE	Benefit rate for labour force extended phase (UI only)
UIMATHRMIN	Minimum hours to qualify for maternity benefits (EI only)
UIMATMINWK	Minimum weeks to qualify for maternity benefits (UI only)
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)
UIMAXSICWKS	Maximum number of weeks - sickness (UI and EI)
UINEREHRMIN	Minimum hours to qualify for new entrant or re- entrant (EI only)
UIOTHBNFCT	UI other benefits per week adjustment factor (EI and EI)
UIOTHWKFCT	UI other benefits weeks adjustment factor (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)
UIREGWKFCT	UI regular benefit weeks adjustment factor (UI and EI)
UIRGERATE	Benefit rate for regional extended phase (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)
UITRBNFCT	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)

#### 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
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
idiinvnd	Interest and other investment income
idinspo	Person's spouse [pointer]
idipens	Pension income (115)
idise	Self-employed income
iditoth	Other taxable income (130)
iditrrsp	Taxable RRSP withdrawals
idnfr	Person's nuclear family [pointer]
idrand	Random numbers [array]
idsex	Sex
idspoflg	Person has spouse
iduirank	Predicted ranked likelihood of getting UI
imfcben	Total Federal Child Benefits
imicnet	Net Income (line 236)
imuccb	Universal Child Care Benefit amount
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
ucdivwk	Minimum divisor weeks
uceff	Effective weekly rate
ucern	Insurable weekly earnings
ucgotpa	Received parental benefits
uchrwk	Hours worked prior to claim
ucmtyp	Main Claim type (majority of weeks)
ucnere	New entrant re-entrant flag
ucothbr	Other benefits weekly rate
ucothwk	Weeks of other benefits
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
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	
imqpcmtb	Quebec parental insurance plan calendar year
maternity benefits	
imqpcmtw	Quebec parental insurance plan calendar year
maternity weeks	
imqpcprb	Quebec parental insurance plan calendar year
parental benefits	
imqpcprw	Quebec parental insurance plan calendar year
parental weeks	
imqpcptb	Quebec parental insurance plan calendar year
paternity benefits	
imqpcptw	Quebec parental insurance plan calendar year
paternity weeks	
imqpipcbn	Quebec parental insurance plan calendar year
benefits	
imqpipcwkw	Quebec parental insurance plan calendar year
weeks	
imqpipt	Quebec parental insurance plan type
(basic/special)	
imqpiptbn	Quebec parental insurance plan total benefits
imqpiptwk	Quebec parental insurance plan total weeks
imqptmtb	Quebec parental insurance plan total maternity
benefits	
imqptmtw	Quebec parental insurance plan total maternity
weeks	
imqptprb	Quebec parental insurance plan total parental
benefits	
imqptprw	Quebec parental insurance plan total parental
weeks	
imqptptb	Quebec parental insurance plan total paternity
benefits	
imqptptw	Quebec parental insurance plan total paternity
weeks	
imuibr	UI benefit recovery
imuidpfg	UI claimants has dependents flag
imuiydep	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 other type of ui/ei payment
ubp5c	Week # of last other type of ui/ei payment
(windowed)	
ubp6	Week # of last training payment
ubp6c	Week # of last training payment (windowed)

**vardef**            Define structure member as an SPSM variable

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## 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.



