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Low Income Lines: What they are and how they are created

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- . not available for any reference period
- .. not available for a specific reference period
- ... not applicable
- 0 true zero or a value rounded to zero
- 0^s value rounded to 0 (zero) where there is a meaningful distinction between true zero and the value that was rounded
- ^{p} preliminary
- ^{r} revised
- x suppressed to meet the confidentiality requirements of the *Statistics Act*
- ^{E} use with caution
- F too unreliable to be published
- * significantly different from reference category ($p < 0.05$)

An HTML version is also available.

Cette publication est aussi disponible en français.

Contents

Abstract

Statistics Canada currently measures low-income using three low income lines: the Low Income Cut-offs (LICOs), the Low Income Measures (LIMs), and the Market Basket Measure (MBM). This publication provides a description of the methods used to arrive at each of these thresholds. It also explains how low-income status and various low-income statistics are determined. Tables presenting thresholds and low-income statistics are available on CANSIM.

Introduction

Statistics Canada has a long history of publishing data on the low income of Canadians. In order to determine who is in low-income, one must first determine a low-income line (LIL). A LIL represents an income value below which a person is deemed to be in low income. A LIL may also be referred to as a cut-off or threshold.

The low income cut-offs (LICOs) were first published in 1967 as part of the 1961 Census monograph series. Conceptually, LICOs are income thresholds below which families would likely have to spend a substantially larger share of their income than average on the necessities of food, shelter and clothing and thus would be living in a difficult economic circumstance.

Following the practice of many international organizations, Statistics Canada began to publish low-income statistics based upon before- and after-tax low income measure thresholds (LIMs) in 1991. The concept underlying the LIM is that all persons in a household have low income if their adjusted household income falls below half of the median adjusted income.

The Market Basket Measure (MBM) was developed by Employment and Social Development Canada[1] (ESDC), and MBM thresholds were first published for the 2000 reference year. The concept underlying the MBM is that a family is in low income if they have insufficient income to afford the cost of a pre-determined basket of goods and services appropriate to their family size and area of residence.

Since their initial publication, Statistics Canada has clearly and consistently emphasized that low-income lines are not measures of poverty. Rather, low-income lines reflect a consistent and well-defined methodology that identifies those who are substantially worse off than others. These measures have enabled Statistics Canada to report important trends, such as the changing composition of those below the low-income lines over time.

The purpose of this document is to provide a brief description of how these low-income thresholds are created. It also describes how some of the commonly used indicators of low income are calculated. Readers interested in more detail are advised to refer to Zhang (2010) or Murphy, Dionne and Zhang (2012).

1. Formerly, Human Resources and Skills Development Canada.

Low-income Cut-offs

What are the LICOs?

Low-income Cut-offs (LICOs) refer to an income threshold, defined using 1992 expenditure data, below which economic families[2] or persons not in an economic family would likely have spent a larger share of their income than average on the necessities of food, shelter and clothing. More specifically, the thresholds represented income levels at which these families or persons were expected to spend 20 percentage points or more of their income than average on food, shelter and clothing.[3] The LICOs are presented using two income concepts. The LICOs before-tax (LICO-BT) use total income while the LICOs after-tax (LICO-AT) use after-tax income.

The LICO-BT are based on the 1992 Family Expenditure Survey, which estimated that families spent 50% of total income on average on necessities of food, clothing and shelter. The LICO-BT thresholds were thus set to income levels where 70% of total income would be spent on these necessities. For the LICO-AT, it was estimated that families spent 43% of their after-tax income on average on necessities of food, clothing and shelter. The LICO-AT thresholds were thus set to income levels where 63% of after-tax income would be spent on these necessities.

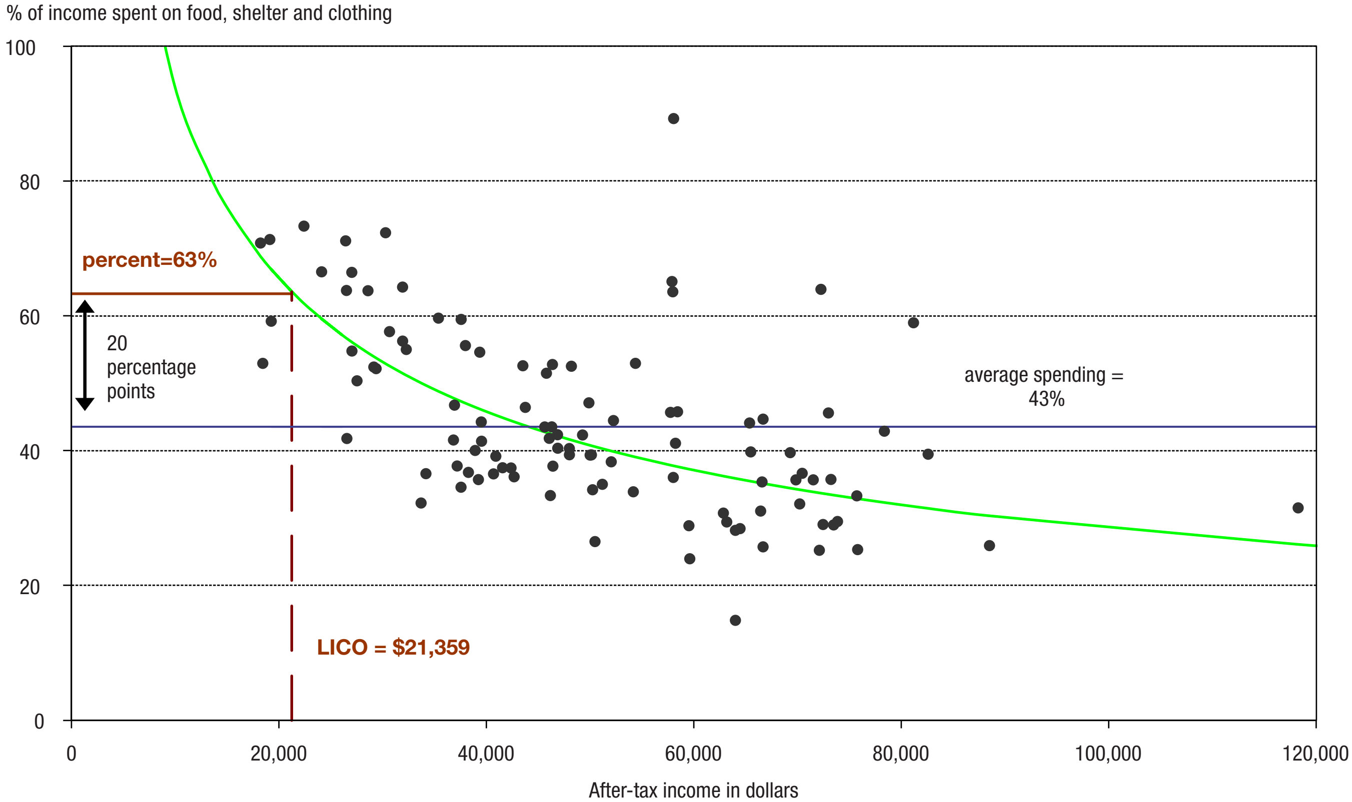
Each type of LICO (-BT and -AT) have 35 cut-offs varying by seven family sizes and five different sizes of area of residence to account for economies of scale and potential differences in cost of living in communities of different sizes.

How are LICOs calculated?

Figure 1 shows the calculation of a LICO using the example of a family of four living in a community with a population between 30,000 and 99,999. The 63% line represents the average proportion of after-tax income that all families (regardless of size) spent on food, shelter and clothing in 1992 (i.e. 43%) plus the 20 percentage point margin. The dots on the chart show the actual observed proportion of income spent by four-person families in that community size on necessities, according to the 1992 Family Expenditure Survey. A regression line is fitted to this distribution and the intersection of that curve and the 63% line gives the LICO—in this case, $21,359.[4] This process is carried out for seven family sizes and five community sizes and results in a table of 35 cut-offs. This operation is done twice: once for before-tax cut-offs, once for after-tax cut-offs.

2. An economic family refers to a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common-law, adoption or a foster relationship.
3. Twenty percentage points are used by convention, based on the rationale that a family spending 20 percentage points more than the average would be in “straitened circumstances”.
4. It can clearly be seen that as income increases, the proportion spent on food, shelter and clothing decreases. In this case, points to the left of the intersection point between the regression curve and the 63% line represent situations where more than 63% of after-tax income is spent on necessities.

Figure 1
Calculation of an after-tax LICO



Source: Survey of Family Expenditures (Famex), 1992.

Having calculated LICOs in the base year 1992, cut-offs for other years are obtained by adjusting the cutoffs using the annual all-items CPI. For a particular year (y) and group (i), the $LICO_{iy}$ is calculated using the following equation:

$$LICO_{iy} = LICO_{i,1992} \times CPI_{y} \ / \ CPI_{1992}$$

Where to find the LICOs?

CANSIM tables presenting the LICOs (-BT and -AT) in both constant and current dollars are available (206-0092 and 206-0094, respectively).

Low income measures

What is the LIM?

Following the practice of many international organizations, Statistics Canada began to publish Low-income measure-based thresholds (LIMs) in 1991. The concept underlying the LIM is that all persons in a household[5] have low income if their adjusted household income falls below half of the median adjusted income. The household income is adjusted by an equivalence scale to take economies of scale into account. This adjustment for different household sizes reflects the fact that a household's needs increase, but at a decreasing rate, as the number of members increases. The adjustment factor, also known as the equivalence scale, is the square root of the number of persons in the household.

5. Household refers to a person or a group of persons who occupy the same dwelling and do not have a usual place of residence elsewhere in Canada. Thus, a household may comprise more than one economic family or a combination of economic families and persons not in an economic family.

LIMs are calculated each year using three types of income. The LIM-Market income[6] (LIM-MI) is calculated using the market income of households. The LIM-Before-tax (LIM-BT) is calculated using the total income of households while the LIM-After-tax (LIM-AT) is calculated using the after-tax income of households. In each case, they are drawn from an annual survey of household income.[7] Because a new set of LIMs is calculated each year using new data, they do not require updating using a price index. Unlike the LICOs, which are derived from an expenditure survey and then compared to an income survey, the LIMs are both derived and applied using a single income survey. Unlike the LICOs and the MBM, the LIMs do not vary by size of area of residence.

How are the LIMs calculated?

The LIM thresholds are derived in multiple steps:

1. Calculate the adjusted household income for each household by dividing the household income by the equivalence scale, which is the square root of the number of persons in the household.
2. Assign this adjusted household income to each person in the household.
3. Determine the median of the adjusted household income over the population of all persons. The median is the level at which half of the population will have adjusted household income above it and half below.
4. Set the LIM for one-person households to 50% of this median and the LIM for households of other sizes to 50% of the median multiplied by the corresponding equivalence scale.

This process is repeated three times, once using market income for LIM-MI, once using total income for LIM-BT and once using after-tax income for LIM-AT.

In 2010, after a comprehensive review of the LIMs, the following three aspects of the LIMs were revised (Murphy, Zhang and Dionne, 2010):

1. Unit of analysis: the median began to be calculated over the population of individuals, as opposed to over that of families or households. As a result, each person in the population is represented by its adjusted household income.
2. Accounting unit utilized: the household replaced the economic family as the accounting unit in which individuals pooled income to enjoy economies of scale.
3. Equivalence scale: to follow the international standard, the equivalence scale was changed and adjusted household income was calculated by dividing household income by the square root of the number of members in the household instead of by an equivalence scale that also depended on the age of each household member.

Where to find the LIMs?

A CANSIM table presenting the LIMs in both constant and current dollars is available (206-0091).

Market Basket Measure (2011 base)

What is the MBM?

Market Basket Measure (MBM) refers to a set of thresholds based on the cost of a specific basket of goods and services representing a modest, basic standard of living developed by ESDC (Hatfield, Pyper and Gustajtis, 2010). The base threshold equals the estimated costs of specified qualities and quantities of food, clothing, footwear, transportation, a shelter and other expenses for a reference family of two adults and two children. As mentioned below, the base threshold is calculated separately for multiple regions. An equivalence factor equal to the square root of economic family size is used to derive the MBM threshold for other family sizes in that region. The MBM

6. Market income refers to the sum of employment income (wages, salaries and commissions, net self-employment income from farm or non-farm unincorporated business and/or professional practice), investment income, private retirement income (retirement pensions, superannuation and annuities, including those from registered retirement savings plans (RRSPs) and registered retirement income funds (RRIFs)) and other income from market sources during the reference year. It is equivalent to total income minus government transfers
7. Starting with reference year 1998, the Survey of Labour and Income Dynamics (SLID) replaced the annual Survey of Consumer Finances (SCF) as the major source of information on family income. Over the 1993 to 1997 period, the two surveys were run in parallel: estimates for this period are produced by combining both samples. Starting with the 2012 reference year, annual individual and family income data is produced by the Canadian Income Survey (CIS).

provides thresholds for a finer geographic level than other thresholds, allowing, for example, different thresholds for rural areas in the different provinces.

MBM thresholds are compared to the disposable income of economic families and persons not in an economic family. Also developed by ESDC, the disposable income for the MBM implements several adjustments to the after-tax income standard.

How are MBM thresholds and disposable income calculated?

The MBM thresholds are based on estimates of the cost of purchasing the following items:

- A nutritious diet as specified in Health Canada's 2008 National Nutritious Food.
- A basket of clothing and footwear required by a family of two adults and two children.
- Shelter cost as the median cost of two- or three-bedroom rental units including electricity, heat, water and appliances.
- Transportation costs, using public transit where available or costs associated with owning and operating a modest vehicle where public transit is not available.
- Other necessary goods and services.

The MBM is updated annually for price changes of items in the basket, and ESDC rebases the MBM basket periodically by examining the methodology of constructing the basket and disposable income. As of the release of this document, the current MBM thresholds are referred to as the 2011-base, and are available starting in 2002.

The MBM provides thresholds based upon the estimated cost of the basket in different geographic areas. As of the release of this document, the MBM thresholds are available for each of 50 different geographic areas - 19 specific communities plus 31 population centre size and province combinations.

Disposable income for the MBM deducts from after-tax income the following non-discretionary expenses:

- personal portion of payroll taxes, such as employment insurance premiums and Canada Pension Plan or Quebec Pension Plan contributions,
- other mandatory payroll deductions, such as contributions to employer-sponsored pension plans, supplementary health plans, and union dues,
- child support and alimony payments made to another family,
- out-of-pocket spending on child care, and
- non-insured but medically prescribed health-related expenses such as dental and vision care, prescription drugs, and aids for persons with disabilities.

For units in households that own a dwelling without a mortgage, a mortgage-free owners' difference in expenditures for the MBM is added to the disposable income. This amount represents typical savings compared to rent or ownership with a mortgage.

Where to find the MBMs?

A CANSIM table presenting the MBM thresholds in both constant and current dollars is available (206-0093).

Low-income status, rate and gap ratio

To determine whether a person is in low income, the appropriate low income line (LIL) is compared to the income of the person's family (or household)[8]. If their income is below the LIL, the individual is considered to be in low income. In other words, "persons in low income" should be interpreted as persons who are part of low income families (or households), including persons living alone whose income is below the LIL. Similarly, "children in low income" means "children who are living in low income families (or households)".

8. When using the LICO or the MBM, the economic family is the appropriate unit. When using the LIM, the household is the appropriate unit.

Overall, the low income rate for persons can then be calculated as the number of persons in low income divided by the total population. The same can be done for various sub-groups of the population; for example, low income rates by age, sex, or province.

After having determined that a person is in low income, the low income gap ratio can be calculated by using the amount that the person's family (or household) income falls short of the LIL, expressed as a percentage of the LIL. First, the low-income gap measures by how many dollars an income falls below a LIL. The low-income gap ratio expresses the low-income gap as a proportion of the applicable LIL. For example, an individual living in a family (or household) with an income of $15,000 and a LIL of $20,000 would have a low income gap of $5,000. In percentage terms, the "low-income gap ratio" would be 25%[9].

In turn, the average gap ratio for a given population is the average of these values as calculated for each person. Statistics such as average and median of the gap and gap ratio provide measures of depth of low income for the low-income population.

CANSIM tables presenting the prevalence of low income (number and rate) and the average gap ratio based on the LIM-AT, LICO-AT, LICO-BT and MBM are available (206-0041 and 206-0042).

9. For those who are not in low income, the gap and gap ratio would have a value of zero. For those who are in low income with no or negative income, the gap is set to be the amount specified by the applicable low-income line. The gap ratio indicator would thus be equal to 1.

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