

POVERTY AND ITS DETERMINANTS IN CANADA

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MAJOR PAPER
PRESENTED TO THE DEPARTMENT OF ECONOMICS
OF THE UNIVERSITY OF OTTAWA
IN PARTIAL FULFILMENT OF THE
REQUIREMENT OF THE M.A DEGREE

SUPERVISOR: PROFESSOR GILLES GRENIER

ECO 7997

OTTAWA ONTARIO
JULY 1992.

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INTRODUCTION

In capitalist or socialist economies, in modern and ancient times, not all individuals or families receive the same level of income. There is always the underclass (poor) in any society, whose plight seems to persist. However, poverty can be reduced if society and policy makers put more effort into dealing with the causes and symptoms of poverty (Aaron 1967, Bhagwati 1988).

In Canada, the problem of poverty has become popular and receives considerable attention in the daily press. Yet, it is not always analyzed in a proper and systematic framework. This lack of analysis could be due to the following reasons:

- A systematic analysis of poverty requires input from disciplines such as economics, sociology, political science, law and psychology. It is rather difficult to try to contain what is basically an interdisciplinary problem.
- The problem of poverty tends to be emotional in nature, where many feel that there is little room for analysis. The need is for action.
- The issue is confounded by the fact that people may support redistribution of income to fight poverty, or oppose it, on the basis of whether they expect to gain or lose from it, and that requires little analysis.

This lack of systematic analysis has obscured our ability to understand the magnitude and dimensions of the problem of poverty. It has also impeded our understanding of the full effects of

various policy initiatives as well as the various trade-offs involved in policy choices.

The objective of this paper is two-fold: first, to outline how poverty is defined and measured in Canada, and second, to determine its causes.

These two issues are discussed respectively in part one and two. Section 1.1 defines poverty and shows how it is related to income inequality. This is very important because, unless we can agree on a specific definition of poverty, it will be difficult to constrain the scope of the debate. Section 1.2 deals with the measurement of poverty; this is essential, because unless we agree on a definition to measure the incidence of poverty, we will never know what has happened in the past. Sections 1.3 and 1.4 review the incidence and composition of poverty since 1969 in Canada. The data indicates that the incidence of poverty among the population decreased in the 1970's, but has remained fairly constant over the last decade.

Section 2.1 outlines the determinants of poverty from a theoretical point of view. There is no consensus on a specific theory that would explain the determination and distribution of personal income. Some of the theories that have been developed are rival, some are complementary, and other theories overlap. Finally, section 2.2 outlines some of the empirical work that has been done in Canada on the causes of poverty, based on some of these theories.

Knowledge of the theories on the causes of poverty and how

poverty is measured is very useful. It helps to initiate appropriate policies that will deal effectively with the problem of poverty and inequality. Without such knowledge, policy responses may run the risk of dealing solely with the symptoms, which is considered to be shortsighted, rather than dealing with the causes of the problem, which is the long term solution.

PART ONE

SECTION 1.1

DEFINITION OF POVERTY

In pure economic terms, "poverty is viewed as a state in which welfare derived from command over resources of a household is limited and falls below a certain minimum welfare level, called the poverty line".¹ (Hagenaars 1986) The expression "minimum welfare level" is of course open to a variety of interpretations and applications. These in turn generate different approaches, or conceptions towards poverty (Gunderson 1983, Hagenaar 1986).

If we interpret "minimum welfare level" to mean basic needs that sustain life and health such as food, housing and clothing², we are talking about the "absolute" definition of poverty. The poor in this case are those who lack the purchasing power for acquiring the market basket containing all and only those goods and services described as basic needs. This definition of poverty is useful to compare the poor from one country to another³.

However, in order to analyze systematically the poverty in a particular country at a given time, it becomes imperative to

¹ Poverty lines are defined in details in the next section.

² This is assuming that we are capable of: i) distinguish between basic needs and other needs. ii) computing the cost of basic needs and that we have the knowledge to transform the cost of basic needs into a level of income.

³ We should keep in mind that there are different climatic and physical conditions between countries.

redefine poverty in a way that allows variation in the concept of "minimum welfare level". In this case, basic needs become culturally and temporally variant, meaning that they are "relative" to the country's standard of living. It is interesting to note that this view was originally expressed by Karl Marx:⁴

The worker's natural wants, such as food, clothing, fuel, and housing, vary according to climatic and other physical conditions of his country.... On the other hand, the number and extent of his socially necessary wants... are themselves the product of historical development and depend, therefore, to a great extent on the degree of civilization of a country.

Using this approach to define basic needs, in a relatively rich society like Canada, poverty becomes as much psychological as it is physiological. The poor individual will not be satisfied with a given standard of living, year after year, when the standard of living of those around him or her are going up. As average income rises, society amends its assessment of basic needs and individuals

TABLE I
SHARE OF TOTAL INCOME QUINTILE 1951-1986

	FAMILIES		
	1951	1975	1986
LOWEST QUINTILE	6.1	6.2	6.3
SECOND QUINTILE	12.9	13	12.3
THIRD QUINTILE	17.4	18.2	17.9
FOURTH QUINTILE	22.4	23.9	24.1
HIGHEST QUINTILE	41.1	38.8	39.4
	UNATTACHED INDIVIDUALS		
	1951	1975	1986
LOWEST QUINTILE	2.7	3.9	5.3
SECOND QUINTILE	8.9	8.9	10.4
THIRD QUINTILE	16.1	15.5	15.3
FOURTH QUINTILE	25.8	25.8	24.2
HIGHEST QUINTILE	40.3	46.1	44.7

SOURCE: STATISTICS CANADA, INCOME
DISTRIBUTION BY SIZE CAT. NO. 13-207

⁴ Karl Marx, Volume I, Capital, (New York, International publisher, 1967), pp.170-171.

tend to evaluate their lives by comparing themselves with others in that society.

When poverty is accepted in its "relative" term, the division of the economic pie becomes very important. In the highly industrialized societies, lagging income⁵ rather than low income is becoming the main issue, and income inequality is an important part of the definition of poverty. Table I shows how important income inequality is in Canada. It is easily noticeable that the shares of income for families in the quintiles have stayed somewhat constant since 1951, especially at the lower quintile. Only the fourth quintile shows any progress. For the unattached individuals, the situation is much the same except for the share of income at the lowest quintile, which has almost doubled from 1951 to 1986.

⁵ After tax income.

SECTION 1.2

POVERTY MEASUREMENT

Conceptual Issues

In order to keep the debate on poverty under control and to be able to derive a consistent poverty line, conceptual issues must be resolved in defining and counting the poor. These issues include how to define needs, what to include in the measurement of income, the status of the individual, the data source and the income inequality measure.

(I) BASIC NEEDS

Basic needs may be seen as the material needs at the lowest end of the hierarchical ordering of needs, or the basket of goods and services which sustain life and health. Basic needs depend on the definition of poverty (Hagenaars 1986). If poverty is defined in relative terms, then basic needs vary across culture and historical periods. The basic needs problem could be resolved by accepting the judgment of experts on nutritional needs and how it varies with family size and location.

(ii) MEASUREMENT OF INCOME

The poverty concept used in this paper is "income poverty", implying that all kinds of after-tax monetary income, less fringe benefits and in-kind transfers, are included. In 1977, Smeeding estimated that the value of non-cash transfers exceeded the value of public assistance in the United States

and showed that the incidence of poverty was reduced by one third when he included the value of non-cash transfers in the poverty lines. Therefore, by using monetary income, we tend to overestimate slightly income inequality (Cloutier 1979). Although this definition of income may not be perfectly compatible with the definition of poverty, in terms of command over resources, it nevertheless gives us a relatively high accuracy, especially at the lowest quintile, which interests us the most.

(iii) STATUS OF INDIVIDUAL

The grouping of the population is based on whether an individual is unattached or belongs to a family. An unattached individual is someone who lives alone and whose income cannot be lumped with any other individual's income, whereas a family is defined as a group of people who share a common dwelling, are related by blood, marriage or adoption, and where all income received by its members⁶ is pooled together to represent one family income.

(iv) DATA SOURCE

Most of the reference data used in this paper comes from the Survey of Consumer Finance, now carried out annually by Statistics Canada (about 42 thousand households in the sample, stratified and probability clustered). Since the same questionnaire has been used since 1951, it is possible to

⁶ The cut-off age is 15 years

construct a consistent series of income data⁷.

(v) INCOME INEQUALITY

There are a number of possible measures to calculate income inequality. Choosing a measure may involve a trade-off between simplicity and accuracy. The most common way of indicating the inequality of the distribution of income can be depicted in a diagram called the Lorenz Curve. It is constructed by computing the cumulative percentiles of income corresponding to the cumulative percentiles of household units (Dagum 1978 & 1985). The relationship between the Lorenz curve and the line of perfect equality enables the calculation of a single statistical measure called the Gini coefficient. This coefficient indicates the degree of income inequality in a certain income distribution. Its value lies between zero (0) and one (1); the closer to zero the greater the equality. The Gini coefficients for Canadian families and unattached individuals combined for 1951, 1975, and 1986 were 0.39, 0.392, and 0.402 respectively (Statistics Canada, Income Distribution by Size, 1986). However, the Gini coefficient does not tell us directly what is happening throughout the income distribution, especially at the lower end, where we are most concerned.

⁷ The survey excludes the homeless and inmates, people living on Indian reserves and the residents of the Yukon and the Northwest-Territories. Therefore, it may underestimate the share of personal income in the lower quintiles.

It is important to be explicit about what these concepts are actually measuring, because of its use in subsequent sections.

POVERTY LINES DERIVATION

In order to address properly the problem of poverty in a country such as Canada, it is essential to be able to estimate the number of poor at a given time. Thus, we need to establish a benchmark or a "minimum welfare" level under which people are considered poor. It is called the "poverty line". The definition of poverty line, or the so-called "low income cut-offs" used by Statistics Canada, depends on how poverty is viewed.

The poverty line can be defined in various ways, depending on whether the absolute or relative concept of poverty is used. If the absolute poverty concept is used to derive a poverty line, poverty is not expected to vary with the change in standard of living; in other words, poverty elasticity with respect to standard of living is zero (Kilpatrick 1973, Osberg 1981). Consequently, we could have a universal poverty line where the poor across the nations can be counted and compared. On the other hand, if the relative concept of poverty is used, we would have a poverty line that is highly related to the general standard of living of a society. Therefore, using the relative poverty concept to derive a poverty line would give policy makers a broader view when dealing with the problem of poverty in a particular area. For example, incidence of poverty measured by an absolute line may be abolished by allocating more basic necessities to the poor. Whereas poverty

measured by relative lines can only be reduced by moving the poor from low paying jobs to areas of the labour market of the economy where earned income is expected to be high enough to lift them out of poverty (Anderson L. 1964). In other words, this can be done by educating and training the poor (Perlman 1976).

There are many ways to derive poverty lines. Some of the methods are rivals, in the sense that the concept of income is used, but there is no consensus on a specific level of income. Others are complementary, starting by using the absolute concept of income, and then expanding to the relative concept.

In the next section, the methodological foundations of some poverty lines are reviewed, and each poverty line is evaluated based on two criteria: first, whether the poverty line reflects the standard of living (relative); second, whether it is objective in the sense that it does not restrict the poor with predetermined choices of goods that make the consumption basket (Sawhill 1988, Gunderson 1983, Hagenars 1986).

I - THE BASIC NEEDS APPROACH

The first poverty line used in poverty research was based on the concept of basic needs developed by Booth in 1892, as mentioned by Orshansky (1965). Basic needs were defined as food, housing and clothing (material needs). The usual procedure is to estimate first the cost of minimum food requirements, and then to use this cost as the basis to set the poverty line in terms of income. When deriving a poverty line based on this definition, we have the

following problems to consider:

- First: A distinction has to be made between basic needs and other needs.
- Second: If we consider food, clothing and shelter to be the most basic needs, how is their cost to be calculated?.
- Third: How is the cost of basic needs to be converted into a level of income that can be used to construct the poverty line?.

First: Basic needs

Basic needs may be defined as goods that sustain life and health such as food, shelter and clothing. However, attempts have been made to change this view and to promote the idea that goods are bought and consumed because they carry meaning or utility; this happiness or meaning could be mental or physical (Sen 1976). It is then important to know the consumption pattern of a given society and what stage of industrialisation it has reached. For example, if people spend most of their time in preparing and producing food, then basic necessities tend to mean food, shelter and clothing. On the other hand, if people spend little time to produce material necessities, then basic necessities mean more than food, shelter and clothing; it must also include mental, social and technological needs. This analysis suggests that we cannot solve the problem of poverty by simply getting people enough to eat and drink. We must redefine basic needs in terms of relative poverty. Therefore, basic needs of a society change when a society gradually moves from one degree of civilization into another. (Marx 1967, pp.170).

Second: Estimation of the cost of basic necessities

Once a consensus has been reached on the definition of basic needs, experts in physiology, sociology and other disciplines who deal with the mixture of the basic needs basket decide on the quantity needed. They must take into consideration the age, occupation, climate and social customs of the population involved. The estimate of the basic needs basket hinges on two basic assumptions. First, there should be no conflict between the expert advice and the individual behaviour. Second, consumers are as well informed or act "like" the experts on the issues of budget constraint and utility maximization. However, the "poor" consumer may lack the knowledge and does not necessarily spend his/her budget as predicted by the experts. Therefore, discrepancies tend to occur between the actual and the estimated cost of basic needs.

Third: Transforming the cost of basic needs into a poverty line

When a certain estimate of the quantity and cost of a basic needs basket is established, we have to find a way to relate this cost and quantity to a level of income that will be considered as the poverty line. One way to achieve this is to multiply the cost of food by the inverse of the average Engel Coefficient⁸. The rationale behind the use of the Engel coefficient in the construction of this type of poverty line is based on the empirical inverse relationship between the share of food and total income.

⁸ Ernst Engel (1821-1896), a German statistician, predicted and showed empirically that the proportion of income spent on food declines as the level of income increases. Engel Coefficient is a number that indicates the proportion of total income spent on basic necessities.

(Hirshleifer 1980 p.104). If the cost of food is multiplied by the inverse of the average Engel coefficient, we obtain a poverty line in terms of income. Assuming that the average Engel coefficient in Canada is one third ($1/3$) of income, we take the estimate of the cost of basic needs and multiply it by 3 to obtain the poverty line. The reason for the multiplication by the inverse of the Engel coefficient is to allow the individuals who are considered poor enough discretionary income for the consumption of other items considered necessary in the view of the experts. This method has been used by Orshansky (1965) in the construction of a poverty index in the United States.

A poverty line constructed using this method is relative if the Engel coefficients are updated periodically. Moreover, the poverty line tends to take into account the relative size of the family unit. Finally, poverty lines are meant to be objective, but there is always some amount of subjectivity, given that experts and policy makers are involved in the decision on the quantity and quality of basic needs.

This method has the advantage of not imposing any restriction on the consumption pattern other than the basic necessities. The only drawback is that poverty lines which are derived using this method are totally sensitive to Engel coefficients which may be difficult to estimate with accuracy.

II - PERCENTAGE OF MEAN OR MEDIAN INCOME

This approach is based on the idea that the poverty line

should be linked to some indicator of standard of living, namely the mean or median income. Therefore, poverty is viewed as a situation where there is relative instead of absolute deprivation. This approach was introduced by S.A. Stouffer in 1949 and is described in a more general context by Townsend (1962). It was applied by many researchers, especially those who believe that poverty is a relative and not an absolute concept. The Canadian Council on Social Development has used this concept (Caskie 1979). The council sets the poverty line at 50% of the mean income of all Canadian families adjusted to different family sizes. The level of income is adjusted to the average percentage increase in Canadian income, which reflects both inflation and the real growth in income due to increase in productivity.

Poverty lines derived using this approach are objective and relative to the standard of living. The problem with this approach is that family size and income may be correlated; in other words large families may be found more often in lower income classes. If the mean income of large families is calculated, their poverty line may be lower than that of small families. Therefore, we tend to lose the concept of relativity.

III - PERCENTILE APPROACH

The percentile approach is based on the concept of income inequality. The income distribution is divided into percentiles and poverty is considered to be found in a certain lowest percentile (lowest 10 or 20 %) (Love 1979). This definition of

poverty line is totally relative to the rest of the population⁹. It has been argued that this choice is the logical choice if someone wants to know which group of people are lagging behind the rest of society (Gunderson 1983). The resulting poverty lines are completely relative, and any decrease in income inequality would lead to an increase in poverty lines. These poverty lines are also objective since they do not restrict the poor in a predetermined level of consumption.

IV - OFFICIAL POVERTY LINES

Policy makers set a poverty line below which one can apply for social assistance. The official poverty line usually reflects the views of the political decision makers. Although the political decisions seem democratic, they do not necessarily represent the view of the population. The poverty line in this case does not need to be derived; it is unilaterally declared. It is therefore considered to be totally subjective, because the politician may not have a good knowledge of the existing standard of living. The scientific foundations are not strong, and it is difficult to build upon it a sound anti-poverty policy (Plotnick 1975, Townsend 1965).

⁹ Since the poverty level varies by family size and geographic location, it is impossible to go directly from information on the share of income held by the bottom fifth to the percentage of the population living at or below the poverty line. However, Statistics Canada does estimate this percentage from more detailed data.

V - SUBJECTIVE POVERTY LINES

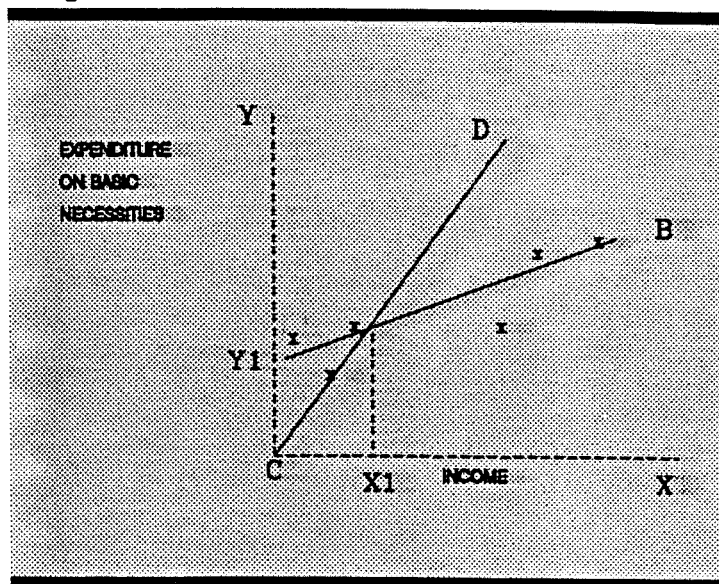
This approach is based on a survey on how people perceive poverty. People are asked to respond to a questionnaire regarding their income, such as what is the minimum income required to not feel poor. The method is based on the relationship between the individual's answer to the minimum income question and their actual income (Hagenaars 1979). The underlying assumption is that people with the same level of income will express similar perceptions of poverty.

Once this assumption has been accepted, an income level may be derived that will provide welfare level to households of different characteristics. (The idea is like transforming the utility function from ordinal to cardinal). The poverty lines are derived by averaging the answers of the sample and extrapolating them to the population level. Using this approach, it is difficult to conclude whether these poverty lines are relative or absolute and whether they are truly objective (no a priori opinion). The reliability of such lines depends on how representative the sample is.

VI - STATISTICS CANADA LOW INCOME CUT-OFFS

In Canada, various concepts of poverty lines have been utilized. The most commonly used is the one developed by Statistics Canada (Love, 1979) and called the "Low Income Cut-offs" (LICO). It refers to the level of income below which people are considered to

Graph I



have low income. This LICO¹⁰ approach is based on the concept of basic needs using a proportion of expenditures on food out of the total income. A certain food-income ratio is taken to be the L.I.C.O line, where a person or a family with a high food-

income ratio is considered to have low income (Wolfson 1987). The estimation of the L.I.C.O can be summarized in the following steps:

- (i) Determine the overall proportion (P) of income spent "on average" by the entire population of families on basic necessities such as food, shelter, and clothing. This is done by dividing the estimated total expenditure on necessities by total incomes.
- (ii) Derive the cut-off proportion to be used to define the low income by adding 20%¹¹ of income to this proportion (P), this will give a line with a slope equal to P+20% of income and an intercept equal to zero (refer to line CD in graph I).
- (iii) From family expenditure data, establish a mathematical

¹⁰ The Low Income Cut-offs is used as a poverty line although Statistics Canada refuses to call it poverty line per se.

¹¹ This procedure has always been acknowledged as arbitrary by Statistics Canada. The rationale is to give the poor more discretionary income while still being considered poor.

relationship (fit a curve) between necessities expenditures and pre-tax income, taking into account the variation in family size, degree of urbanization and geographical regions.

(IV) Given the mathematical relationship, the income level which corresponds to the specified proportion of spending on necessities represents the low income cut-off or the poverty line.

The final two steps in the procedure are illustrated by graph I. Where income is shown on the horizontal axis; expenditure on necessities on the vertical axis. The line B, corresponds to the mathematical relationship (log-linear) estimated between these two variables. The line CD is drawn with a slope equal to the proportion of income spent on necessities. The two lines cross, giving the average level of the low income cut-off; left of the intersection point, people are considered poor. It is assumed that the sample used has homogeneous family size, and the relationship between expenditures on necessities and income is direct.

The relationship between expenditure on necessities and income was modeled using two forms of regression equations: Linear and log-linear.

The linear form is:

Where: E is the estimated of total expenditure of income spent on basic necessities.

X is the level of income.

$$E = a + bX + \sum cFS_i + \sum dU_j + \sum eR_k + \epsilon$$

FS_i is the family size.

U_j is the degree of urbanization.

R_k is the region of residence.

ϵ (epsilon) is the error term.

Where: FS_i , U_j and R_k are dummy variables.

The regression tries to portray the relationship between the dependent variable (expenditure on necessities), and the independent variables (level of income (X), family size (FS), degree of urbanization (Du) and region of residence

TABLE II
Estimated poverty lines (1978 base) by size of area of residence and family size for 1985.

Family size (members)	POPULATION				
	500000 or more	100000 499999	30000 99999	small urban area	rural urban area
1	10651	10116	9490	8774	7877
2	14053	13339	12339	12445	11546
3	18799	17815	16650	15488	13785
4	21663	20588	19266	17903	15936
5	25243	23982	22290	20768	18531
6	27571	26049	24349	22647	20231
7	30347	28735	26856	24975	22290

Source: Statistics Canada, Income Distribution by Size 1988.

(R)). If the regression does not truly reflect the relationship, then the LICO's are considered biased.

In 1961, Statistics Canada established the poverty line at the level of income of which the average family of a given size spent

70% or more of its income on basic necessities. It was adjusted to 62% in 1969, and the most recent adjustment, which took place in 1978, established it at 58.8%. This procedure has been acknowledged by Statistics Canada as arbitrary. The rationale is to give the poor more discretionary income while still being considered poor, and to take an implicit consideration for changes in standard of living. (Osberg 1981, Wolfson 1987)

The LICOs are updated annually to offset the effect of inflation and to yield a poverty line that reflects the real purchasing power of people at the poverty line of income. These adjustments are based on the overall consumer price index without considering any relationship between poverty lines and the growth in real income that can occur due to changes in productivity (Osberg 1981). By not adjusting the poverty line to the real growth of income, the fraction of the population defined as poor will have a tendency to drop and the Low Income Cut-off will no longer be representative, especially, if the concept of relative poverty is used. Let us suppose that the poverty line was initially drawn at \$5000 per year or one-half of the average income of \$10,000 per year. If there is a real growth of 3% per year with no inflation, in 15 years the income of the average family will grow to \$15,580 per year. However, the poverty line will remain at \$5000 because we assumed zero inflation, which is now only one third of the average income. Table II shows the estimated poverty lines (1978 base) by size of area of residence and family size for 1986. It is easily noticeable that the level of the poverty lines

declines as we move away from the city. It is assumed that people away from the city tend to produce more of their food, and also need less discretionary income to get by. Therefore, they tend to have a much lower level of expenditure for food and shelter. Also, it is worth noticing that the level of the L.I.C.O increases with the size of the family.

VII OTHER POVERTY LINES

Another poverty line definition used in Canada is the SENATE COMMITTEE POVERTY LINE. This line has been developed by using a standard budget for basic necessities for a family of four as its starting point. (Croll 1971, pp 199). The poverty line is then adjusted by a point system which tries to recognize the cost of an additional family member. Poverty begins when less than 30% of income is available for discretionary purpose on general consumption. This poverty line is updated annually to reflect the average percentage of real growth of the Canadian family income.

SUMMARY OF THE VARIOUS POVERTY LINES

It should be clear by now that poverty is an issue of perception which reflects very much the attitude of the population and policy makers in general. Individuals and policy makers who downplay the poverty issue tend to support the absolute definition of poverty, whereas, others (including the poor) who advocate income redistribution tend to prefer the relative definition of poverty. Different definitions of poverty lead to various

formulations of poverty lines, resulting in different levels of incidence of poverty.

In Canada, the only comparison between poverty lines was made in 1979 by Caskie. He compared the Statistics Canada poverty line with those derived by the Council on Social Development and the Senate Committee in terms of their proportion to the average income for the year 1979. He found that the Senate Committee poverty line was 56% of mean income, followed by Council on Social development with 50% and Statistics Canada line with 42%.

Sawhill (1988) did a comparison between poverty lines in order to reflect the effect on the poverty rate in 1984 within the United States. Using Orshansky's definition, the poverty rate stood at 18.6%; with the Current Population Survey, the poverty rate was 14.4%; and using the official poverty definition, the poverty rate was 11.0%.

In a nutshell, none of the approaches to construct poverty lines can claim general acceptance. Each method has its advantages and disadvantages. The key point is that the choice of a particular method is arbitrary. This lack of general consensus makes it difficult to get the full support of the well-off individuals and policy-makers.

SECTION 1.3

THE EXTENT OF POVERTY IN CANADA

One of the most important uses of a poverty line is to measure the incidence of poverty and to outline the characteristics of the poor in a given region.

Once a poverty line income level is specified, it is possible to measure the extent of poverty or the degree to which people fall below the poverty line. In 1976, Sen, in his famous article on poverty index, described three basic elements that should be included in a poverty index:

- 1) - Incidence of poverty or head count.
- 2) - Poverty gap ratio.
- 3) - Comprehensive poverty measure.

In order for the poverty index to provide a summary of the available information on the poor, it must have the following desirable properties (axioms):

- Monotonicity axiom. Other things remaining the same, a reduction of income of a person below the poverty line must increase the poverty measure.
- Transfer axiom. Other things remaining the same, a pure transfer of income from a person below the poverty line to anyone who is richer must increase the poverty measure.
- Population symmetry axiom. If two or more identical populations are pooled, the poverty index should not change.

Head count ratio or poverty rate:

This ratio is defined as the number of poor divided by the total number of people in the population. The head count ratio is a crude index of poverty because it is insensitive to the decline of income of those below the poverty line (violates the monotonicity axiom); thus, we cannot tell how poor are the poor. Also, it is insensitive to the transfer of income from among the poor and from the poor to the nonpoor (violates the transfer axiom).

Statistics Canada provides data on the proportion of the population whose income is below

the poverty line. The estimated rate for 1986 is 14.9 for all units (families and unattached individuals), or 3,689,000 persons. Table III illustrates that the incidence of poverty has fallen for all units in Canada between 1969 and 1986. The incidence of poverty declined substantially during the seventies, it increased during the early eighties as a result of the recession, and then declined again during the mid eighties.

It is difficult for a single index to meet all the axioms required by Sen (Kakwani 1980). The head count ratio measure provides adequate information about the intensity of poverty when all the poor are assumed to have exactly the same level of income,

TABLE III
Trend of incidence of poverty in Canada (1969-1986)

Year	(POVERTY RATE)		
	Families	Unattached	All persons
1969	28.8	42.8	25.1
1979	13.1	40.3	15.7
1980	12.2	39.6	15.1
1981	12.0	37.8	14.7
1982	13.2	37.4	16.1
1983	14.0	41.3	17.1
1984	14.5	37.8	17.3
1985	13.3	36.8	16.0
1986	12.3	34.3	14.9

Source: Statistics Canada, income distribution by size 13-207 1988.

below the poverty line. In practise, income among the poor is not evenly distributed. If society enforces a minimum income standard for all its members, the problem of poverty would disappear. This brings us to study another class of poverty measurement, namely the poverty gap.

AVERAGE POVERTY GAP

This is defined as the average income gap of the poor, divided by the poverty line. It estimates the shortfall of income in relation to the poverty line. Average poverty gap is very important when targeting social policy, especially in time when the government's budget deficit is very high and expectations for economic growth are very low. Knowing the poverty gap will help us become more selective and direct scarce resources to those most in need.

The average poverty gap (APG) is defined as:

$$APG = \sum (L_i - Y_i) \div Q_i$$

where:

L_i is the poverty line (i);

Y_i is the income of a poor household;

Q_i is the number of poor households.

The estimated poverty gap in Canada for 1985 was \$6.4 billion after accounting for transferred income. This represents the income shortfalls of families and individuals given a set of poverty lines. This means that in order to raise the income of the

poor over their respective poverty lines, we must transfer an estimated \$6.4 billion to the poor (Messinger 1987).

Table IV shows the estimated average poverty gap in Canada by age and family type for 1985. It is clear that the elderly population (65 years of age and over) has a much lower average poverty gap than other age groups. This is due mainly to the fact that the government social programs attempt to provide the elderly with the adequate basic

Family type	Age of Head				All ages
	>25	>45	>64	65+	
Single male	3922	4038	4176	1588	3642
Single female	4608	3846	4070	1546	2830
Couple without children	2846	3919	3688	NA	3422
Couple with children	5922	5558	5387	NA	5508
Single parents	5309	5547	5362	2189	5338
All types	4502	4961	4488	1592	3973

Source: H. Messinger (1987).

income guarantees. Couples with children have the highest average poverty gap, but they are the least likely to be poor because their poverty rate is only 8.3%.

The poverty gap ratio does not indicate the number of people in poverty. The same ratio could prevail whether we have a population of one poor person or a thousand. Therefore, using different concepts to measure the incidence of poverty tends to give us different stories.

So far, we have examined two major aspects of poverty; incidence and poverty gap. Each of these measures has showed us a different picture of poverty. Bringing these measures together into

a single measure provides an overall perspective as to how groups compare.

COMPREHENSIVE POVERTY MEASURE

The head count and the gap concepts, mentioned above, do not provide a fully informative measure of poverty, since neither gives adequate information on the exact income distribution among the poor. However, both concepts together with the Gini Coefficient are used to derive the comprehensive poverty measure (Sen 1976).

$$P = H * [I + (1 - I) * G_p]$$

Where: P is the poverty index.

H is the head count ratio or incidence of poverty.

I is the poverty gap ratio.

G_p is the Gini coefficient of the income of the poor.

The rationale of this formula could be explained as follows:

- (i) a gap between the mean income of the poor and the poverty line, represented in the formula by (I), ignores the distribution of income among the poor;
- (ii) a gap produced by the unequal distribution of mean income of the poor provided by the Gini coefficient of the poor G_p ;
- (iii) by multiplying the gap ratio by the Gini coefficient, weighted by the ratio of the mean income of the poor to the poverty line income level (1-I), the income gap increases and takes into account the gap arising from the unequal distribution of income;

(iv) the result is multiplied by the number of the poor to calculate the poverty index P.

This measure of poverty uses an axiomatic approach to rank order the welfare derived from the income of the poor without using the cardinal utility functions, assuming a monotonic relation between income and welfare. The poverty index value can vary between 0 and 100, with 0 means no need and 100 representing a 100% income-need ratio, meaning that all the poor have zero income. In Canada, Messinger (1987, Economic Council of Canada) calculated a poverty index using a slightly different formulation:

$$C = I * [P + (1-P) * D]$$

where: C is the comprehensive poverty measure.

I is the incidence of poverty.

P is equal to $(1-R)$ where R is the income needs ratio (Y_i/L_i) .

D is the relative standard deviation of the poverty gap.

This formula is similar to Sen's poverty index. The difference is that Messinger used the relative standard deviation of the poor instead of the Gini coefficient of the poor.

Table V shows the comprehensive poverty index for 1985. It indicates that single parent families under 25 years of age suffer the most, their index being 41.6. We also notice that although people aged 65 and over have a high incidence of poverty, the index appears to be very small. This is an indication of the generous social programs that exist to support the elderly.

TABLE V
Comprehensive poverty measure by age of the poor

Family type	>25	>45	>64	65+	All ages
Single male	21.1	13.6	17.6	7.4	15.1
Single female	25.9	.2	19.2	11.4	15.7
Couple without children	3.9	1.4	3.6	NA	2.0
Couple with children	13.6	4.5	3.5	NA	4.4
Single parents	41.6	19.6	13.0	4.2	17.4
All types	18.9	7.1	7.9	6.1	8.7

Source: N. Messinger (1987).

SECTION 1.4

CHARACTERISTICS OF THE POOR IN CANADA

The two concepts of incidence of poverty and distribution of the poor can be used to describe the characteristics of the poor in Canada. I defined in an earlier section the incidence of poverty within a group as the proportion of people who are poor in that particular group (head count). Distribution of poverty refers to how poverty is distributed amongst various groups, that is, the proportion of poor people who fall within each group. In 1985, the overall incidence of poverty indicated that about 13.3 percent of Canadian families and 36.8 percent of unattached individuals were poor (Statistics Canada, Income Distribution by Size).

According to Statistics Canada, families are more likely to be poor if they have the following characteristics:

- live in the Maritime region;
- have four children or more;
- headed by someone under the age of 25, or over the age of 65;
- headed by a female;
- headed by someone who has elementary education or less, or by someone not in the labour market.

Poor families are also likely to rely mainly on transfer or pension income, or to be headed by a self-employed individual (refer to Tables 1.1 to 1.6 in Appendix I).

Incidence of poverty among the unattached individuals shows

that they are in a much worse situation. This reflects the fact that the majority of the unattached people are likely to be young or old, 59 percent of them are not in the labour market, and 42 percent of them are over 65 years of age.

This enumeration of the characteristics of the poor tells us which group is the most vulnerable to poverty, but it does not explain the causes of their situation. Nor does it tell us where to accentuate the antipoverty programs, since the poor with any particular characteristic are considered homogeneous.

It would be appropriate in terms of poverty analysis to differentiate the poor according to some of the causes pertaining to their situation and how to deal with it. To do this, the poor population was divided by Boulet (1990) into two major groups. The first group links poverty to personal and family conditions. The second group links poverty to economic conditions, such as the lack of job market opportunities and economic growth.

The first group could be further divided into three sub-groups, permanent, quasi-permanent or transitory state of poverty.

PERMANENT POVERTY

This group includes persons who are permanently poor, such as people 65 years of age or over, persons who are unable to work, such as the disabled and mentally ill, persons who are voluntarily

inactive¹² or on involuntary retirement, and persons aged between 24 and 64 who, for one reason or another, have never worked.

Individuals in this category are permanently poor because they do not count on the labour market to improve their situation; they simply are discouraged (Osberg 1981, Boulet 1990). In Canada, it was estimated by Boulet¹³ that 17.9% of the poor did not work from 1980 to 1985. In comparison, Bane and Ellwood (1986), estimated that only 12% of the people found poor in the United States in 1967 were still poor in 1975. Boulet disaggregated his estimate to reveal that 30.2% were permanently incapable of working (disabled and mentally ill), 23.5% were voluntarily not active (discouraged), 8.4% were aged between 25 and 64 years and never worked for more than five years, and 38.0% of poor people aged between 25 and 64 did not work.

The only way to alleviate permanent poverty is through an increase in transfer payments, such as income support programs and in-kind transfers (Messinger 1987, Beausoleil 1988, Boulet 1990).

QUASI-PERMANENT POVERTY

This category is formed mainly of couples whose working member has a low earning job and whose other members have never worked, is voluntarily inactive, or is unable to work due to lack of opportunities. Boulet estimated the number of this type of poverty

¹² Boulet identified a group of people who had never worked for at least five years without any reason.

¹³ Boulet used data Income and Families statistics 1985, Statistics Canada data bank. According to him, a person who did not work for five years or more is counted as permanently poor.

to be 449,750 persons in 1985, out of which 113,520 were families; the proportion of the group among the total poor population was 11.4 %. The incidence of poverty in this category was 12.2%. This class of poverty can be decreased substantially through programs that can encourage the idle partner to participate in the job market.

TRANSITORY POVERTY

As will be seen in later sections, this type of poverty attracts a lot of interest, especially from policy and theoretical point of view. The situation of the poor in this category tends to change in the short or medium term (within five years). Its members are mostly students or couples with very young children where one member is forced to stay at home with the children, as well as older couples, where one is 65 of age or older, and the other is less than five years away from retirement. Using the estimates calculated by Boulet, the poor in this category formed 19.6 % of the poor population, out of which 45.8 % were students, 24.7 % were families with young children and only 0.6 % were couples near retirement age. It is very difficult to better the situation of the poor in this category through specific programs.

POVERTY CAUSED BY ECONOMIC CONDITIONS

This type of poverty is mainly due to economic conditions such as unemployment or low earnings. The state of poverty in this group is not permanent, although it could stretch for a long period of time. In this group, we find people with the following

characteristics:

- Young individuals having difficulties to enter the job market, either because of lack of experience, or lack of demand for their labour (especially during a recession), or lack of appropriate skills for the job market.
- Family units living from agriculture who face low cashcrop demand and who are not eligible for unemployment insurance.
- Self-employed family units who may declare a business loss and who are not eligible for unemployment insurance.
- Family units who participate fully in the labour market but whose level of earning is too low to keep them above the poverty line.
- Family units who hold seasonal or part-time jobs and whose total earning does not allow them to escape poverty.

Poverty in this group can be alleviated using policies such as job creation programs, subsidies and transfers payments, and retraining programs (Ross 1987, Caskie 1979, Boulet 1990). Boulet estimated that 36.7 % of the poor in Canada in 1985 fell in this category, out of which 48 % were 24 years of age or less.

Differentiating the poor in terms of the cause of their financial situation enables authorities to formulate appropriate policies to deal effectively with the problem of poverty. It also helps in the setting of alternative strategies or action plans.

PART TWO: DETERMINANTS OF POVERTY

So far, it has been stated that poverty can be defined in two basic forms, absolute or relative. Then it was shown that there are many approaches to derive poverty lines. Finally, we tried to analyze the poor in terms of their number (head count), how severe their poverty is (poverty gap and poverty index), and by their characteristics (region, age, sex and social status). The basic questions remain. Why are they poor? What causes their plight? There are a number of theories that could help answer these questions.

SECTION 2.1

THEORIES ON THE DETERMINANTS OF POVERTY

The poverty concept used in this paper refers to income poverty, implying that a household is considered poor if its income falls below the poverty line. If we want to assess the determinants of poverty we have to analyze the socio-economic variables affecting the level of income¹⁴. A considerable number of theories based on socio-economic variables have been developed to explain the differences in personal income (Sahota 1978). None of the theories restricts the cause of differentials in personal

¹⁴ It is necessary to know why people have different levels of earnings in order to be able to say what the consequences of various policies would be, and to decide whether a greater or lesser redistribution is required.

income to a single variable.

HUMAN CAPITAL THEORY

The foundation of this theory goes back to the days of Adam Smith and Alfred Marshal, and became very popular in the 1960s. The approach is based on the neoclassical concept of marginal productivity, where the labour market system responds to utility maximizing individuals (supply) and profit-maximizing firms (demand) in order to determine individual earnings (wages). Firms' demand for labour is determined when marginal productivity is equal to wages. This implies that individuals' earnings are determined by the level of their productivity. Furthermore, if we assume that the higher the level of skill the higher the productivity, then labour, in order to earn higher wages, must upgrade or enhance its skills. In other words, individuals with higher relevant skills tend to have a higher level of earnings. For instance, according to Adam Smith (1776, p.100), "wages vary with the cost of learning the business".

The supply of labour, on the other hand, has both qualitative and quantitative aspects. The quantitative aspects refer to the number of hours an individual is willing to work. The qualitative aspects refer to those dimensions that are related to the nature of the occupation. This could be naturally determined by basic intelligence and health; or it could be acquired by investing in human capital such as education, training (skills) and mobility.

Therefore, differences in income are the result of unequal distribution of work effort, skills and abilities, which in turn is

the result of individual choices or decisions to work and invest in human capital (Taubman 1975, Hageaars 1986, Sawhill 1988). The individual decision regarding investment in human capital is based on the cost incurred by such investment, and the future benefit in the form of a higher income stream. Such an investment will only be made if the benefits are greater than the costs.

Mincer (1974) formulated a model where he demonstrated that the human capital analysis accounts for rising age-earning profiles, which vary by education level, if people invest rationally in on-the-job training. The human capital earning function took the following form:

$$\ln Y_t = \ln Y^t + E_s + f_t$$

Where S is the years of schooling, e is the rate of return on S , f is the rate of return for on-the-job training t and Y^t is the level of earnings determined by genetic endowment and other elements of the environment that affect skills and earnings.

In an earlier model, Mincer (1958) assumed that human capital investment is confined to formal education. He found that no more than 7% of the differences in earnings could be explained by formal education. When he added the on-the-job training variable to the model, he found that about 33% of earning differentials could be explained. He also concluded that at a high level of formal schooling, the elasticity of on-the-job training investment with respect to earning is greater than one (1) and that at low level of formal education the elasticity is less than one (1). This means that training has a higher rate of return.

Therefore, the human capital theory plays an important role in explaining the differences in income. Policy-makers have been influenced by this theory up to the present time. They have initiated subsidies on education and health and welfare programs as well as national training programs and labour market information. For instance, during the period 1986-87, the Canadian government spent more than \$28 billions on health and post-secondary education, and \$1.8 billion on job creation and retraining (Courchene, 1987). Unfortunately, the rich tend to benefit disproportionately and hence, benefit more than the poor (Cloutier 1979, Gillespie 1980, Mehmet 1978).

The major drawback of human capital theory is that it presents human capital as a source of earning, but it ignores the reasons why individuals decide to invest in human capital, such as family social class and environment. In Canada, D. Forcese (1975) researched the effect of family's social class on the aspiration of children. His research confirmed that educational aspiration is primarily a function of social class level of one's family, and rural versus urban residence. Children from lower class families are socialized to aim at much lower goals than their middle and upper class counterparts. In 1974, Statistics Canada¹⁵ stated that the probability of attending post-secondary institutions is much higher for the children of upper-income class. Mehmet (1978) also concluded that children of upper-income background are more likely to attend universities than children from families of lower

¹⁵ Statistics Canada 1974, cat.# 13-561, pp. 45.

income class. They also tend to specialize in areas which have an expected higher future income.

INHERITANCE THEORY (Meade J. 1964)

This theory follows the Cambridge theory of functional income distribution. It emphasizes the classical economic theories on factors of production and social classes. According to this theory, capitalists perpetuate their economic positions; the more they have, the more they invest and accumulate; whereas, workers get their income from their labour and do not save. The resulting functional distribution is considered to correspond to social classes. This suggests that there is no intergenerational mobility; meaning that the rich will always be rich and the poor will always be poor. However, there is evidence of significant interclass mobility and change in property ownership that proves investments are not entirely financed out of capitalist savings and workers contribute from their savings.

The inheritance theory plays a key role in determining income inequalities, especially at the upper tail. The theory hypothesizes that income differentiation is mainly a result of inheritance, both monetary and non-monetary, the latter including mental and physical abilities instilled in children while being raised. The level of earning, therefore, will depend on the supply of capabilities. The rate of poverty will be reinforced through lack of inheritance. However, No comprehensive empirical or scientific evidence is available to back up this theory. On the

contrary, scientific evidence suggests that capabilities, especially mental (I.Q), can be enhanced through education (Osberg 1981, Perlman 1976).

CHANCE THEORY

This theory was formulated by Gibrat (1931), and was further discussed by Taubman (1975, chap. 1 & 4) and Kakwani (1980). Based on the statistical law of probability, Gibrat formulated the stochastic theory of income inequality which took the form of a lognormal distribution. According to this theory, initial earnings depend on an individual's ability, but the change in earnings in later years depends on mere chance. The model in logarithm form:

$$Y_t = Y_{t-1} + u_t$$

Where the level of income is a function of past period income and the error term. The error term is assumed to be serially uncorrelated.

This theory does not explain the variance in earnings through a systematic cause, as other theories and modern evidence seem to suggest. Instead it tells us that poverty hits at random. Taubman (1975) tested this theory using a longitudinal survey of 5000 persons. He found that education, training and mental ability accounted for the differences in earnings in the sample, which is contrary to the prediction of the chance theory. He also found that the error term is heteroscedastic with respect to education, training and mental ability, contrary to the assumption of the theory that the error term is homoscedastic.

Therefore, the chance theory is not useful to systematically explain the variance in income within a population.

SEGMENTED LABOUR MARKET THEORY

Another cause of income differences is attributed to the imperfection or non-competitiveness of the labour market. It emphasises the importance of non-economic factors, such as institutional, social, legal and cultural institutions, on the operation of the labour market (Smith D. 1976).

This theory states that the labour market is divided into two major sectors, the primary sector and the secondary sector. The primary sector offers high wages, good working conditions, employment stability and good opportunities, while the secondary sector offers low wages, high turnover, lack of mobility and bad working conditions. These differences within the labour market may explain the main reason for variance in earnings. Stratification of the labour market, for some, is due to discrimination on the basis of age, sex and race. Brown et al, (1980)¹⁶ showed that only 14 to 17% of wages differentials between men and women is attributed to differences in human capital, and the rest is based on market segmentation and discrimination. Although empirical evidence on racial discrimination is hard to prove in some countries, it is easily seen in other countries. Research in the United States showed employers discriminated against candidates based on race (Anderson 1964, Brown et al 1980). This would create

¹⁶ United States, National Longitudinal Survey for the year 1971.

barriers for various races to obtain certain positions with high earning potential. Lack of mobility of labourers may cause regional wage differences, as well as differences between rural and urban areas. This is very well documented in the methodology of poverty line derivation (refer to poverty line Table II).

This theory suggests that being in the primary as opposed to secondary labour market, being a man instead of a woman, being white instead of black, and living in the city instead of living in rural area makes a crucial determinant of one's earnings. It is not only the skill characteristics of the individual, as emphasised by the human capital theory, that matter, but the individual physical characteristics and the characteristics of the job. Anderson (1964) showed that the mean income of the nonwhite family stood at 61% of their white counterpart given similar geographical characteristics. Some discrimination based on age and sex is apparent in Statistics Canada yearly report on income distribution (Statistics Canada, Income Distribution by Size) where, for example, men tend to have a higher earnings average than women (refer to table 1.6 in Appendix I). This does not mean that all earning differences is caused by discrimination. But we could safely conclude that discrimination could be a significant contributor to the differences in earnings.

ECONOMIC GROWTH THEORY¹⁷

¹⁷ This is not a theory of poverty per se, but there are a lot of policy makers and academics who believe that poverty is mostly caused by lack of economic growth.

Up to this point, it has been shown, at least theoretically, that the problem of poverty is multi-dimensional in terms of causes and effects. There are a lot of factors which enter in the determination of why there are differences in income. Some of these factors are structural in nature, that is, they are related to poor education, health, or racial discrimination. Other factors are related to economic prosperity (Galloway 1965, Gottshalk & Danziger 1985).

There are good reasons to expect economic growth and lower unemployment to raise the income of the poor. According to Sawhill (1988), more than half of the poor in the United States are classified as working poor. When poverty is looked at from this point of view, we can conclude that the basic cause of poverty is inadequate earnings. Two major factors account for low earning:

- Low paying rate;
- Insufficient number of hours worked, due to unemployment or involuntary part-time employment.

In Canada, Boulet (1990) estimated the proportion of poor families whose poverty is directly related to economic conditions to be 36.7% in 1985. Statistics Canada (1985) showed that families whose heads are not in the labour force have a higher chance of being poor. They accounted in 1985 for 25.5% of the poor population, as shown in Table VI, compared to 9.6% for those who are working. The proportion of unattached individuals who are not working is also very revealing; they were estimated at 56% of the poor population in that category (Statistics Canada cat 13-207).

Statistics Canada also publishes information on poverty rate among families and unattached individuals by weeks worked, full time or part time working status of head, by employment experience and by occupation of head of family. It

TABLE VI
Poverty rate by labour force status 1980 to 1986.

Year	Family Head		Unattached Individuals	
	Working	Unemployed	Working	Unemployed
1980	8.0 %	29.6 %	21.7 %	66.7 %
1981	7.9	27.3	21.7	66.7
1982	9.5	27.1	20.6	64.1
1983				
1984	10.5	27.7	24.0	58.7
1985	9.6	25.5	23.4	56.0
1986	9.0	23.3	22.3	52.4

Source: Statistics Canada, Income distribution by size 13-207

shows that the majority of the working poor are likely to be in the secondary labour market, which is highly sensitive to economic conditions. The holders of secondary jobs suffer from three strong forces that induce poverty:

- (i) their earning rate is low;
- (ii) they are the first to be laid off when economic conditions worsen; and
- (iii) their length of time between jobs is relatively long (Perlman 1976).

Economic growth, measured by increase in output per capita, may result in a general increase in earnings that will push many working poor above the poverty line. However, the effect of economic growth in alleviating poverty in general, is limited because of the existence of a hard-core residue of poverty or permanent poverty where economic growth does not trickle down (

Boulet 1990, Perron and Vaillancourt 1988, Gallaway 1965). During a recession, most of the burden falls on the poor; they suffer a reduction in their income through unemployment, as well as their relative position in terms of income inequality. During the recession of the early 1980's, the Gini coefficient was about 0.45 in 1980 and rose to about 0.475 in 1983 (estimated by Statistics Canada).

SECTION 2.2

EMPIRICAL EVIDENCE

Empirical research related to the theories on the determinants of poverty has concentrated on the effect of economic growth. One obvious reason is that data on economic growth and earnings are well documented and easily assessable to researchers and policy makers. Data supporting other theories are only partially available, such as data on education and type of employment effect on earnings. Therefore, it is difficult to use incomplete data to conduct detailed empirical analysis of the various theories on the determinants of poverty.

Effect of Economic Growth on Poverty.

Many empirical studies on the impact of economic growth on poverty were done in the United States. Among them, L. Anderson (1964) used a time series regression (data from United States 1947 to 1960) to estimate the relationship between the percentage change in groups' median income to the percentage change in deflated personal income per capita. He found that the median income of poor families with a female head and poor families with a head aged 65 and over are insensitive to changes in per capita personal income. Also, the median income of farm families does not respond to growth in per capita income. A 4% increase in per capita income results in a 2.7% decline in poverty rate. Families headed by a white male aged less than 65 years are the major beneficiaries of

economic growth (the sensitivity rate was 60% for white and 33% for non-white).

A similar approach to estimating the sensitivity of the incidence of poverty in various subgroups to changes in average per capita income for the total population was done by Lewis et al. (1971). Using data from 1947 to 1964, the authors obtained similar results to Anderson but with higher sensitivity for all groups. A 4% increase in per capita income leads to a 3.2% reduction in incidence of poverty. The rate of sensitivity depends on the situation of the subgroup with respect to their social status and the industry where they are working.

Another study was done by Thornton et al, (1978), using data from 1947 to 1974. The model, a modified version of Lewis et al's model, analyzed the changes in poverty incidence with respect to changes in real G.N.P., unemployment rate and the percentage change in real transfer payments. The study actually claimed that the effect of economic growth on poverty was overestimated. Under the absolute definition of poverty, regression results were less significant than the result obtained by Anderson and Lewis et al. However, when the relative definition of poverty was used, the result did not change much from the studies by Anderson and Thornton and al.

Given this controversy and the lack of stability in the results, Gottschalk and Danziger (1985) proposed a different methodology to estimate the relative effect of growth on poverty. Their model decomposed the actual change in poverty rate between

two consecutive years into three main effects; (i) change in mean market income over the need ratio, (ii) change in mean transfer income over the need ratio, and (iii) change in the shape of the distribution. The central assumption of their model is that the distribution function of the income to need ratio follows a displaced lognormal distribution.

Perron and Vaillancourt (1988) applied the same model using Canadian data for the period 1977, 1981, 1982, and 1984. (See Table 2.1 in Appendix 2). From a theoretical point of view, it is anticipated that an increase in the change in mean market income over needs would decrease the poverty rate. Similarly, an increase in the change in mean transfer income over needs ratio would decrease the poverty rate, and a decrease in income inequality would decrease the poverty rate. Looking at the results in Table 2.1 (Appendix 2), we notice a decline in poverty rate over the period 1977 to 1981 in all groups, which is mainly due to economic growth (the result may be misleading because the years are not adjacent). For the period 1981-82, the effect of economic growth was positive, which means a deterioration in the poverty rate. While the effect of transfer income and inequality was negative, and the total effect for all group was negative, except for the elderly, where there was an increase in the poverty rate. Similar results were obtained for 1982 to 1984.

In general, economic growth had its effect on poverty as anticipated. During a period of high economic growth, the effect on poverty rate was negative, while during periods of recession, it

was positive. The effect of transfer income on poverty rate showed more consistency than the effect of economic growth.

When Gottshalk and Danziger (1985) applied their model to data from the United States, they found that inequality increases with economic growth; the result from Perron and Vaillancourt showed the opposite conclusion. The results suggest that Canadian poor benefit from economic growth much more than their American counterparts. This may be due to the socio-economic structure of Canada, which is different from the United States, or that Canada's poverty has a close relation to economic growth.

Another model was developed by Perron and Vaillancourt (1988), where the poverty rate was taken as a function of socio-economic variables, such as real GDP, unemployment rate, transfer per capita, percentage of population aged between 15 and 24 years, percentage of population aged 65 years and over and percent of population of divorced women. This model is very similar to a model used by Gottschalk and Danziger (1985) and Anderson (1964) in the United States. Unfortunately, the model excludes one important variable that plays a significant role in determining income; namely education. In the theory, the level of education was found to be an important determinant of income.

The model took the following form:

$$Y_{it} = \beta + \sum \beta_{kit} X_{kit} + e_{it}$$

Where $i = 1$ to 5 and it represents five economic regions in Canada:

Atlantic, Quebec, Ontario, Prairies and British Columbia.

$t = 1$ to 14 is time index of the series, 1971 to 1984.

k indexes the independent variables.

Dependent variables Y_k : poverty rate for families, unattached individuals and all units by region and year.

Independent variables X_{kk} : Real GDP per capita, unemployment rate, transfer payments, percentage of people aged 15-24, percentage of people aged 65 or more, percentage of total divorced women, regional variables.

The hypotheses on the effect of the independent variables¹⁸ are as follows. It is assumed that (i) an increase in the level of the real GDP per capita will lower the poverty rate, (ii) an increase of real transfer will reduce the poverty rate, (iii) a decrease in unemployment rate will reduce poverty rate, and (iv) an increase in the divorce rate (proxy for single parent) should increase poverty rate, because of the high rate among single parents. Regional variables are included as dummies.

After performing ordinary least squares¹⁹ on the model in a linear form with no regional considerations, meaning that all regions were assumed to be homogenous, Perron and Vaillancourt found that the coefficient of the variables confirmed the theoretical expectation between 1971 and 1985 (refer to Table 2.2 in Appendix 2).

¹⁸ These hypothesis are based on theories of determinants of income.

¹⁹ The use of the ordinary least square may suffer from the problem of multicollinearity, because of the inclusion of GDP and the unemployment rate.

The GDP per capita is negatively related to the poverty rate, but the value of the coefficient was very small (0.0019) for all units. This means that the poor benefit very little from changes in the level of the GDP, and that the major share of the increase in the GDP is going to the top and middle income populations. Therefore, according to the results, using the GDP as a policy indicator would not be very effective.

The unemployment rate is positively related to poverty with a coefficient equal to 0.72 for families. This variable appears to be a better indicator of poverty in Canada, and its use as a policy variable would be effective.

The transfer per capita is negatively related to the rate of poverty with a coefficient equal to 0.021 for families. This also shows that pursuing a policy of transfer payments will not have a strong impact on reducing the poverty rate.

When the regional variables were introduced into the equation, the results did not show a significant impact on the coefficients of the model.

The interesting result of the model was that cyclical recoveries lead to a decrease in income inequality, whereas, cyclical downturn generated an increase in income inequality. Increasing income inequality can lead to higher incidence of poverty as was the case in Canada during the early 1980s recession (refer to Table 1.1 in Appendix 1). The result is opposite to those found by Gottshalk and Danziger (1985) in the United States.

As shown by the empirical evidence, economic growth tends to

have a significant effect in alleviating poverty, but it does not trickle down evenly over the various groups. Therefore, pursuing a policy of economic growth tends to help the poor, but some groups such as the disabled and the mentally ill will not benefit directly.

Obviously, we need a lot more research in this area to explain why Canada has opposite results to that of the United States.

CONCLUSION

Dealing with the poverty issue is a complicated matter. Using a purely relative definition of poverty, it is impossible to eliminate its incidence, even if we rearrange the economic pie, because there is always a bottom quintile. Using an absolute definition, poverty in Canada may cease to exist.

In order to measure the extent of poverty, various poverty lines were defined on the basis of both the relative and absolute concepts of poverty. It was shown that using different methodologies to establish poverty lines leads to different poverty rates.

In order to link poverty to its social and economic causes, the poor population was divided into groups. It was shown that certain groups are particularly vulnerable to poverty, and it was concluded that the poor are not a homogeneous group.

There are many theories on the determinants of poverty. Most of the theories use qualitative variables such as social class, family environment, training programs, education and health to explain the determinants of poverty. Policies influencing those factors could be as effective as transfer programs and economic growth to fight poverty.

Empirical evidence showed that economic growth is effective in alleviating poverty, but it trickles down unevenly over the various groups. Therefore, pursuing a policy of economic growth tends to help the poor during economic recovery. However, counter-cyclical social programs are still needed to reduce poverty during times of

recession, and to help those who are permanently poor.

Additional research is required in the following areas. First, the income concept should be refined a little further to include the impact of in kind transfer payments. Second, the economic growth effect should be explored further in order to determine the range of income where economic growth trickles down the most. According to Anderson's (1964) model, it was found that economic growth trickles down the most for young white males aged between 25 and 40 years.

Although the amount of research on the determinants of poverty was extensive, future research should be concentrated on the issue of externality of poverty, in the sense that the existence of poverty not only deprives the poor, but it impoverishes the whole economy. The economic consequences of the inadequate participation of the poor is in the billions of dollars. This represents an output that these people could have contributed to the economy if their productive capacity had been better developed and effectively used. Additionally, there are other costs that arise directly from the social problems caused by poverty, such as large expenditures for health care, welfare services and crimes associated with low income population.

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APPENDIX 1

TABLE 1.1
POVERTY TREND, 1969- 1986

	POVERTY RATE	NUMBER (MILLIONS)
1969	23.1	4.85
1979	15.7	3.73
1980	15.1	3.48
1981	14.7	3.51
1982	16.1	3.90
1983	17.1	4.20
1984	17.3	4.20
1985	16.0	4.00
1986	14.9	3.69

poverty rate evolution

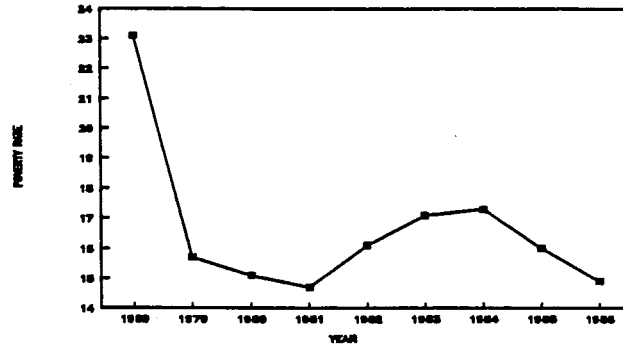


TABLE A indicates the evolution of poverty in Canada, between 1969 and 1986.
Source: Statistics Canada 13-203.

TABLE 1.2
FAMILY POVERTY BY SEX AND AGE

	POVERTY RATE			
	< 65		> 65	
	FEMALE	MALE	FEMALE	MALE
1980	46.6	8.1	21.2	13.3
1981	40.5	8.3	24.7	12.9
1982	44.7	9.7	23.2	9.4
1983	47.1	10.4	17.0	10.4
1984	46.1	10.9	21.4	10.1
1985	46.7	9.6	16.5	9.1
1986	42.0	9.1	16.5	8.7

Source: Statistics Canada 13-203.

TABLE 1.3
FAMILY POVERTY TRENDS BY EDUCATION OF HEAD
POVERTY RATE

	HIGH SCHOOL		POST-SECONDARY
	PRIMARY	SCHOOL	
1980	18.8	12.2	4.5
1981	18.9	11.6	4.7
1982	18.6	14.1	5.3
1983	19.9	15.7	5.2
1984	19.6	16.2	4.9
1985	18.8	14.4	4.6
1986	16.7	14.4	4.2

Source: Statistics Canada 13-203.

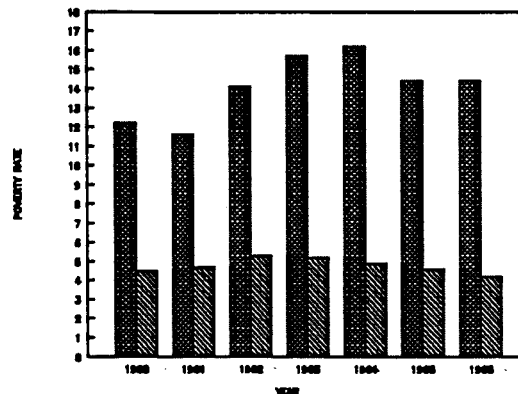


TABLE 1.4
POVERTY TRENDS BY LABOR FORCE STATUS OF HEAD
POVERTY RATE

	FAMILY		UNATTACHED	
	WORKING	NOT	WORKING	NOT
		WORKING		WORKING
1980	8.0	29.6	21.7	66.7
1981	7.9	27.3	20.4	64.1
1982	9.5	27.1	20.6	64.1
1983	10.3	27.8	25.2	64.4
1984	10.5	27.7	24.0	58.7
1985	9.6	25.5	23.4	56.0
1986	9.0	23.3	22.3	52.4

Source: Statistics Canada 13-203.

TABLE 1.5
POVERTY BY OCCUPATION OF HEAD, 1986

OCCUPATION	FAMILY	UNATTACHED
	RATE	RATE
MANAGERIAL	3.4	8.6
PROFESSIONAL	4.6	13.3
CLERICAL	10.2	19.8
SALES	8.6	26.7
SERVICES	19.6	46.3
FARMING	18.2	34.8
PROCESSING	6.0	20.0
FABRICATION	8.1	17.9
CONSTRUCTION	9.6	28.1
TRANSPORT	9.0	20.1
NOT IN LABOR FORCE	23.8	52.7

Source: Statistics Canada 13-203.

TABLE 1.6
AVERAGE EARNINGS (\$) BY SEX (FULL TIME)

YEAR	WOMEN	MEN	RATIO
1980	19930	31005	64.3
1981	19341	30392	63.6
1982	19186	29988	64.0
1983	19200	29975	64.1
1984	19634	29961	65.5
1985	19502	30027	64.9
1986	19874	30131	66.0

Source: Statistics Canada 13-203.

APPENDIX 2

Table 2.1: Relative Effects of Changes in Growth Transfers and Inequality on Poverty Rates, Canada

	Actual percentage point change in poverty	Growth Effect: change in mean market income over needs ratio (1)	Transfer Effect: change in mean transfer income over needs ratio (2)	Inequality Effect: change in the shape of the distribution (3)
All households				
1977-81	-4.60	-3.03	-0.50	-1.07
1981-82	-2.70	1.10	-1.23	-2.57
1982-84	4.60	3.28	-0.26	1.58
Households headed by:				
Young men				
1981-82	-5.40	-0.32	-1.12	-3.96
Prime-aged men				
1977-81	-1.00	-2.13	0.11	1.02
1981-82	-2.00	1.53	-0.69	-2.84
1982-84	4.90	1.34	-0.08	3.64
Elderly				
1977-81	-23.30	-5.84	-4.56	-12.90
1981-82	1.70	3.63	-0.74	-1.19
1982-84	-6.80	-1.58	-3.09	-2.13

Notes: A positive sign indicates a deterioration during the period of time considered and a negative sign indicates an improvement.

Column (3) is calculated as the difference between the actual percentage point change in poverty and the sum of columns (1) & (2).

Source: Perron, P. and Vaillancourt, F. (1988).

TABLE 2.2

Regression Results, Poverty Rates, Canada, 1971-1984
Linear Form

Variables / Statistics	Families	Individuals	All units
Constant	53.88 (6.47)	125.1 (5.64)	69.41 (7.13)
GDP per capita (1981 \$)	-0.0009 (-3.15)	-0.0042 (-5.53)	-0.0019 (-5.75)
Unemployment Rate	0.72 (3.96)	-0.44 (-0.78)	0.25 (1.21)
Transfers per capita (1981 \$)	-0.021 (-7.26)	-0.012 (-1.13)	-0.16 (-4.59)
% of population 15 - 24	-0.92 (-1.86)	1.63 (1.35)	0.11 (0.19)
% of population 65+	-0.84 (-0.99)	-7.95 (-3.44)	-3.03 (-3.05)
% of population divorced women	2.63 (1.06)	20.44 (3.19)	8.54 (2.93)

NOTE: Numbers in bracket represent the t statistics at 5% level.
Source: Perron, P. and Vaillancourt, F. (1988)