MEASURING OFF-RESERVE ABORIGINAL POVERTY AND INCOME INEQUALITY IN CANADA

Measuring Off-reserve Aboriginal Poverty and Income Inequality in Canada

by

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ABSTRACT

Though there has been substantial research on poverty and inequality in Canada, the issue of Aboriginal poverty and inequality has not yet been examined in a systematic manner. The issue has been discussed, in some cases, as a part of the overall poverty profile, and mostly analysed in a cross-sectional manner. A complete and methodical study of Aboriginal poverty and inequality that allows behaviour of poverty and inequality to be analysed over time remains to be initiated. In order to get a comprehensive comparative picture of Aboriginal income poverty and inequality in Canada, the research measures off-reserve Aboriginal and non-Aboriginal income poverty and inequality for the period 1996-2007 and compares the results for off-reserve Aboriginal and non-Aboriginal population groups. For measurement purposes Statistics Canada's low income cut-offs are considered as poverty lines. Several commonly known along with some axiomatically correct poverty indices such as Headcount Ratio, Income Gap Ratio, Poverty Gap Index, Foster-Greer-Thorbecke Index, Sen Index and some modifications of the Sen Index such as the Sen-Shorrocks-Thon (SST_O) Index are used. The Gini coefficient is used as the measure of inequality. Both pre-tax and post-tax incomes are considered. Though a substantial decline in off-reserve Aboriginal poverty is recorded by most of the poverty indices by early 2000s, off-reserve Aboriginal poverty remains higher than non-Aboriginal poverty. After the decline, these off-reserve Aboriginal poverty indices remain stable and show some decline from mid-2000s onwards. Income inequality among the non-Aboriginal population remains stable throughout the period whereas off-reserve Aboriginal income inequality shows a slightly increasing trend in the 2000s. According

to the breakdown of the SST_O Index, the decline in off-reserve Aboriginal poverty is mainly due to decline in the headcount ratio.

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CONTENTS

CHAPTER 1

INTRODUCTION

Though poverty is not officially measured at the government level in Canada, there is little doubt about its existence and persistence which is reflected in numerous policy debates as well as in academic research. For example, every year Statistics Canada publishes a report titled *Income in Canada* that contains observations on levels and trends of various income related variables. This report contains information about low income in Canada. While poverty is not officially recognized, this concept of low income comes close to it. A family is considered living in low income if it is below a threshold called the Low Income Cut-off (LICO) and spending a larger portion of its income on food, shelter and clothing than an average family. According to *Income in Canada 2007*, the after-tax low income rate among the economic families was 5.8 per cent in 2007, a decline from 10.1 per cent in 1998. For unattached individuals the rate declined from 35.2 per cent in 1998 to 27.4 per cent in 2007. These numbers support the fact that there exists poverty, in the guise of low income, in Canadian society.

However, poverty among the Aboriginal population is an issue which is well-known but not necessarily well-researched. Though research has sought to understand the socio-economic disadvantages of the Aboriginal population in Canada, there has been limited systematic effort to formally address, measure and consistently track Aboriginal poverty. The same can be said about Aboriginal income inequality. For example, the Royal Commission on Aboriginal Peoples (1996) in its 4000-page report narrated the state of Aboriginal people by looking at factors such as their high dependence on government

transfers, their high unemployment and the large income differences between Aboriginal and the non-Aboriginal peoples, but the report did not directly discuss poverty and income inequality. Furthermore, when it comes to poverty measurement for the Aboriginal population, the discussion remains limited mainly to a headcount of the poor, rather than using a theoretical framework that one would find in the standard poverty literature.

The measurement of poverty poses some generic challenges – how to define poverty, what threshold or poverty line to choose to identify the poor, and what poverty index to use for aggregation. These challenges become more complex for measurement of Aboriginal poverty. Can we look at poverty arising only from lack of income or should there be any other dimensions to Aboriginal poverty? Can we choose a poverty line for the Aboriginal population that is applicable to the non-Aboriginal population? The challenges are made even more complicated when it comes to identifying the Aboriginal population, distinguishing between on-reserve and off-reserve Aboriginal population, and extracting information on Aboriginal income and expenditures. Many major government datasets such as the census and the Survey of Labour and Income Dynamics (SLID) are still inadequate in this regard. In the case of the measurement of Aboriginal income inequality, similar challenges do crop up with regard to appropriate definition and indices.

This thesis was sponsored by the Manitoba Research Alliance (MRA) and funded by a SSHRC CURA grant on poverty in inner-city and Aboriginal communities. It was felt that the knowledge of off-reserve Aboriginal poverty and income inequality was sadly lacking and that this research might make an important contribution in throwing light on recent developments. Identifying trends in off-reserve Aboriginal poverty and income

inequality was thought to be important for both policy makers and for other researchers within the MRA, as until this thesis our ignorance about off-reserve Aboriginal poverty and income inequality has been staggering. Addressing the lacking could provide important pointers for future research in the area of social change, economic growth, migration and fiscal policy involving the off-reserve Aboriginal population.

Given this backdrop, this research measures off-reserve Aboriginal and non-Aboriginal poverty and income inequality indices in Canada for the period 1996-2007 by using the census and the SLID data. Some selected indices of poverty and income inequality are calculated to see how these are behaving over a period of twelve years, and if the behaviour is any different from what has been observed by other studies prior to this study. Comparisons are made between the Aboriginal and the non-Aboriginal indices. Most of the poverty indices are calculated for the first time for the off-reserve Aboriginal population in Canada. Income inequality for the off-reserve Aboriginal population is also calculated for the first time for these twelve years. The indices are calculated for economic families and unattached individuals by considering both before and after-tax incomes.

In order to measure Aboriginal poverty and income inequality and compare them to non-Aboriginal poverty and income inequality, the research proceeds in the following manner.

Chapter 2 gives a detailed account of different concepts of poverty and income inequality. Such a discussion on the one hand gives the reader an idea about how thoughts on poverty and income inequality have evolved over the last few decades, and on the other, provides the background for choosing a particular definition of poverty and income inequality to be used in this research.

The chapter begins with a review of poverty literature conducted by Sen (1981), then looks at some other review studies done by Hagenaars (1991), Kanbur and Squire (1999) and Osberg (2007), among others. Some of the concepts of poverty discussed are more popular and widely used than others, such as the income approach, the expenditure approach, and the biological approach. Some of the concepts are broader than the popular ones such as the concepts of poverty related to health, nutrition and literacy. Some of the alternative concepts are theoretical and not fully operational such as the capability approach, the multidimensionality approach, and the human rights approach. All these concepts can be divided into monetary and non-monetary concepts of poverty (See table 2.1). There are limitations and debates related to each of these concepts, but despite such complications, all these concepts help in understanding the extent and diversity of the concepts of poverty.

The chapter continues with a discussion of absolute and relative poverty, highlighting that both these aspects of poverty have something to offer and that one should not be sacrificed in favour of the other.

From all these relevant concepts, the income based definition of poverty is chosen for this research due to its popularity, usability and easy availability of data to work with.

Chapter 2 also discusses income inequality as one aspect of economic inequality. As this research deals with income poverty, logically it makes sense to look at income inequality. Whereas poverty is related to lack of resources such as income, inequality refers to unequal distribution of resources such as income. While poverty looks at an isolated group of the population segregated by the poverty line, inequality looks at the income

distribution of the entire population. The measurement of income inequality allows one to compare what is happening to access to resources over time as well as among various groups of the population.

Chapter 3 focuses on various measurement issues. First, it discusses different concepts of the poverty line that help in setting the demarcation line for identifying the poor. Two sets of poverty lines are discussed. One set contains the poverty lines used worldwide such as absolute poverty lines based on the food-energy method and cost of basic needs method, and relative poverty lines based on median or mean income. The other set contains the lines specific to Canada such as LICOs, Low Income Measures (LIMs) and Market Basket Measures (MBM). The LICO is chosen as the poverty line for this research because of its widespread use, popularity, and ability to capture expenditure on basic needs, and geographic and demographic variations in expenses.

Then a list of major or core axioms or preconditions needed to be satisfied by a sound poverty index is discussed in this chapter. Here the core axioms are critically looked at and their implications analysed. A discussion on poverty indices follows. Some of the major indices such as the Headcount Ratio (H), the Income Gap Ratio (I), the Poverty Gap Index (HI), the Sen Index (S), the Sen-Shorrocks-Thon Index (SST_O) and the Foster – Greer – Thorbecke Index (FGT or HI2) are also discussed.

It is shown in chapter 3 that HI, SST_O and FGT stand out in succession as better candidates for poverty indices compared to H, I and S with reference to the axioms. However, the H and the I are simple and easy to understand and cannot be ignored, and S is the breakthrough index that provided the basis for SST_O. All these indices are utilised

to measure poverty for the Aboriginal and the non-Aboriginal population groups considering before and after tax income.

The chapter wraps up with a discussion of inequality axioms and indices. The Gini Coefficient (G) is chosen for measuring income inequality for the poor (G_p) as well as for the whole population (G_w) because it satisfies most of the axioms. Furthermore, G is widely used, and some of the poverty indices calculated here incorporate G.

After providing a background on the Aboriginal population of Canada, Chapter 4 presents the existing literature on Aboriginal poverty and income inequality. The chapter discusses the studies available, and indicates what is lacking in the Aboriginal poverty and income inequality research. It is observed from the review of the literature that research on Aboriginal poverty and income inequality is generally inadequate. Discussions on Aboriginal poverty and income inequality focus mainly on comparison of incomes and some other socioeconomic variables such as education and employment among different groups of the Aboriginal and the non-Aboriginal population. Poverty is mainly discussed in terms of incidence of poverty, without giving any reason why other indicators of poverty are not important. The measurement of Aboriginal poverty and income inequality using standard indices for a long period of time is non-existent.

The chapter shows that though there have been improvements in Aboriginal education, employment and income, the Aboriginal population group is still behind the non-Aboriginal group, and the differences in employment, income and education have not registered substantial reduction. There have been declines in Aboriginal poverty and income inequality but the gaps between Aboriginal and non-Aboriginal poverty and

income inequality have not narrowed significantly. The chapter also provides a picture of overall Canadian poverty and income inequality. Poverty has declined over time and income inequality has stabilised at a higher level since the late 1990s compared to the previous periods.

Chapter 5 is the chapter on methodology and results. This chapter tackles several aspects of the research. This research uses the census data for the years 1996, 2001 and 2006 and the SLID data for the years 1996-2007. The two sets of data are used to see if similar trends in poverty and income inequality are found. Economic family and unattached individuals are used as the units of analysis. Both before and after-tax income are looked at. The Aboriginal population is determined on the basis of self-reported identity in case of the census, and employment equity in case of the SLID. Only the off-reserve Aboriginal population is considered. The indices are calculated for both the Aboriginal and the non-Aboriginal population groups of the ten provinces, excluding the northern territories.

The chapter shows that there has been a major decline in Aboriginal poverty by early 2000s measured in terms of H, HI, HI2, S, and SST_O. After the decline, Aboriginal poverty indices remain stable but then show some decline from mid-2000s onwards. However, despite the decline, poverty measured by all these indices is considerably higher for the Aboriginal population than it is for the non-Aboriginal population and the gap in poverty for the two population groups does not show any clear indication to converge. Income inequality among the non-Aboriginal population remains stable throughout the period whereas Aboriginal income inequality shows a slightly increasing trend in the 2000s.

The chapter compares the findings of this research with that of the existing literature. The declining trend in overall poverty and moderately increasing to somewhat stable trend in overall income inequality suggested by the previous studies are also found by this research.

Finally, Chapter 6 summarizes the research, indicates some of the limitations of the research and suggests some possible future direction of the research.

CHAPTER 2

POVERTY AND INCOME INEQUALITY

In order to set the backdrop for measurement of poverty and income inequality, this chapter provides a brief account of some major concepts of poverty and income inequality by looking at the relevant literature starting from the early 1980s till the present time. Though not all the concepts discussed in this chapter are going to be used later for the measurement purpose, the reader will get an overall idea about the complexity of the concepts from this discussion.

2.1 Poverty

In order to understand poverty we need to look at various concepts and approaches that define poverty. In this section some of the leading concepts and approaches are discussed along with the concepts of absolute and relative poverty.

2.1.1 Poverty Defined

The dictionary-meaning of the word 'poverty' has evolved over time from meaning simple lack of money to meaning not having a socially acceptable amount of resources . In 1973, the Oxford dictionary defined poverty as "the condition of having little or no wealth or material possessions" (p. 1643). This definition of poverty has been revised in 1998 as "want of the necessities of life" (p. 1135). On the other hand, the Merriam-Webster dictionary defined poverty as the "lack of money or material possessions" (p. 709) in 1977, whereas in 2003 the definition of poverty has been modified to mean "The state of one who lacks a usual or socially acceptable amount of money or material

possessions. ... Poverty may cover a range from extreme want of necessities to an absence of material comforts" (p. 973).

This evolution of the meaning of poverty actually reflects how our perception of poverty has changed over time. In academic discourses as well as in policy discussions on poverty, the debate has primarily revolved around defining poverty and what constitutes poverty.

Borrowing from the dictionaries, poverty can be loosely defined as a socially unacceptable state in which people experience a standard of living that does not allow meeting all the basic necessities of life due to lack of resources such as income. However, this simple definition gives rise to many questions regarding scope, identification, measurement, and aggregation of poverty. For example, what constitutes basic necessities is a matter of debate, so is the realm of social acceptability. Some would contend that basic necessities are defined by standards of the day whereas some would argue that basic necessities are limited to physical needs for bare survival. Some would look for current social standards in order to determine the purview of acceptability, whereas others would reason for set social standards fixed over time.

As another example of the debate, the definition of poverty given by Lipton and Ravallion (1993) can be considered. According to them, poverty is a shortfall from a level of economic welfare that is considered a "reasonable minimum" (p. 1). In their view, economic welfare is often represented by consumption of goods and services and minimum requirement is demarcated by basic consumption needs. One can find this definition to be quite limiting as economic welfare is interpreted in terms of consumption

expenditure, but according to the authors, it is indeed "the most important dimension of poverty, and a key determinant of other aspects of welfare, such as health, longevity and self esteem" (Lipton and Ravallion, 1993, p. 1).

The poverty literature is quite rich in various contrasting views on poverty, and it is actually difficult to find one uniform definition of poverty. This section attempts to journey through the changing views on poverty over time while keeping the Canadian context in mind. This means some of the views that are better able to explain poverty in a developing country context, may not get emphasis here as our concern is with Aboriginal poverty in Canada. That does not mean those concepts are less significant. It just means they warrant a different forum for any effective discussion. This section and the subsequent sections on alternative concepts of poverty, and absolute and relative poverty provide a comprehensive picture about concepts regarding poverty, without making any judgement in favour of any particular concept. These concepts are discussed with their pros and cons. A few of them are dated, but most of them have some relevance in understanding poverty from diverse perspectives.

Nobel Laureate A. K. Sen is the first stop of the journey. Sen provides a thorough survey of various existing concepts of poverty in one of his major books *Poverty and Famines*. According to Sen (1981), the concept of poverty has three aspects – identification of the poor, determination of the interest group (poor or non-poor) upon which to focus, and aggregation of poverty.

Sen (1981) suggests use of some standards such as "consumption norms" or "poverty lines", discussed in detail in chapter 3, for the identification purpose. Those below the

standards should be considered poor. While discussing the interest group, Sen (1981) argues that the concept of poverty should primarily focus on the well-being of the poor, "since in an obvious sense poverty must be a characteristic of the poor rather than of the non-poor" (p. 10). Causation and effects of poverty, which may or may not involve the non-poor of the society, are important issues associated with understanding poverty. Aggregation of poverty, according to Sen (1981), involves measurement of poverty, and measurement of poverty is based upon the underlying analytical concept of poverty.

Sen (1981) discusses several existing alternative approaches to the underlying analytical concept of poverty. These are – the biological approach, inequality approach, relative deprivation approach, value judgement approach, and policy definition approach.

The biological approach, the most known yet criticised approach to poverty, looks at minimum nutritional requirement for survival, and inability to attain this requirement indicates poverty. Rowntree (1901) first empirically used this approach to measure poverty. Sen (1981), referring to Townsend (1971, 1974), Rein (1971), Sukhatme (1977, 1978), and Srinivasan (1977, 1979), points out several problems associated with this direct and conventional approach. First, identifying the level of minimum requirement is difficult as it depends on "physical features, climatic conditions and work habits" (p. 12). Second, converting the minimum nutritional requirement into a uniform minimum food requirement is difficult due to differences in choices of commodities depending on consumption habits. The minimum food basket may make it possible to fulfill nutritional requirement at a minimum cost, but that basket may not reflect differences in preferences and habits. Third, it is difficult to specify minimum requirement for non-food items.

To resolve all these problems, Sen (1981) observes that, at a practical level first a minimum nutritional bundle is determined somehow, then the cost of that bundle is determined from which is determined the minimum income requirements. Comparison is then made between the income level of an individual and the minimum income, and poverty is determined in an indirect manner.

Despite all these problems, Sen (1981) is not in favour of completely dismissing this biological approach to poverty. He believes that it is possible to gather information on direct nutritional intake through sample surveys of consumption bundles and in such cases use of income as an intermediary is not needed. Sen (1981) believes that for many developing countries malnutrition is a key aspect in understanding and estimating poverty. Therefore, this biological approach needs to be researched further.

Sen (1981) refers to Miller and Roby (1971) to present the view of poverty as inequality, but at the same time highlights the fact that there is a fundamental difference between these two concepts. Poverty and inequality are related but one cannot be seen as part of the other. Miller and Roby (1971) look at poverty as differences in income among various quintiles of the society, and poverty elimination is about narrowing the differences. Sen (1981) argues that a transfer of income from the top income group to a middle income group would surely reduce inequality without necessarily reducing poverty, though the inequality approach would identify this as a decline in poverty. On the other hand, a decline in overall income, without any change in the distribution, would be interpreted as no change in poverty according to this poverty-as-inequality approach despite the fact that such decline in income may result in malnutrition, starvation and hardship. That is

why Sen (1981) argues that "Neither poverty nor inequality can really be included in the empire of the other" (p. 15).

Referring to Runciman (1966) and Townsend (1971), Sen (1981) talks about the concept of relative deprivation as poverty.[1] According to this concept, poverty is seen as how deprived one is in relation to other members of the society. But Sen (1981) asks if this relative deprivation is a feeling or a condition, and thinks both are important aspects to consider and cannot be detached. Objective determination of conditions of relative deprivation is based on subjective feelings of relative deprivation, and therefore, an objective understanding of feeling is necessary. Sen (1981) also thinks that the choice of the reference group – in relation to which an individual determines his deprivation – is an intricate aspect of poverty as relative deprivation. The final evaluation of Sen (1981) about this approach is that poverty cannot be a concept solely based on relative deprivation because when it comes to starvation, famines, and malnutrition there is "an irreducible core of absolute deprivation" (p. 17) that supersedes the concept of relative deprivation. Poverty analysis would not be appropriate if the focus is on the relative picture, rather than the absolute picture, in such cases. As Sen (1981) asserts, "Thus the approach of relative deprivation supplements rather than supplants the analysis of poverty in terms of absolute dispossession" (p. 17).

Sen (1981) explains the value judgement approach to poverty by quoting Orshansky (1969), "poverty, like beauty, lies in the eye of the beholder" (as cited in Sen, 1981, p. 17). It is up to the moral judgement of an individual researcher to decide what should be considered poverty. Sen (1981) opposes this view outright. He maintains that though

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[1] Discussion on absolute and relative poverty is given in a latter section in this chapter.

questions of value judgement, conventions and norms are essential in addressing poverty, poverty itself cannot be determined on a scale of value judgement. A researcher on poverty should take prevailing conventions as fact, and should not mingle these with her own personal moral judgments.

In order to discuss the policy definition of poverty, Sen (1981) quotes from the *Poverty amid Plenty* that

> At any given time a policy definition reflects a balancing of community capabilities and desires. In low income societies the community finds it impossible to worry much beyond physical survival. Other societies, more able to support their dependent citizens, begin to consider the effects that pauperism will have on the poor and non-poor alike. (as cited in Sen, 1981, p. 19)

Sen (1981) points out two difficulties with this sort of policy definition of poverty, a definition that relies on feasibility oriented public policy standards. First, there are various factors that affect policy making and hence the policy definition of poverty. These factors are – political organization, nature of the government, sources of power, and influence of other organizations. As diverse as these factors can be, the policy definition of poverty would be quite varied. Second, policy recommendations depend on feasibility, and to be in line with feasibility, the policy definition of poverty may not capture various layers of deprivation. For example, in an impoverished nation, if the government is able to provide only one meal to the starving population, and not two, it may well happen that the government ends up announcing poverty as a state of deprivation where people cannot afford one meal a day. By doing so, the government is

going to disregard the fact that there are people who are not able to manage two meals a day, and leave them outside the purview of poverty elimination programmes. Just because a country has become a high income or a low income country, does not mean that the standards against which poverty is measured should go up or down immediately, but policy definitions may do just that. According to Sen (1981) the policy definition of poverty makes poverty elimination a factual, not ethical, exercise, and the facts relate to the policy standards that define deprivation.

In summary, from the above discussion it appears that it is better to look at poverty from an absolutist point of view in terms of the biological approach either through an intermediary of income, or more preferably directly through the basic nutritional requirement. The idea of relative deprivation can be supported as only supplementary to the discussion of poverty as absolute deprivation. The inequality point of view should not be combined with the concept of poverty. The ethical judgement perspective is also not acceptable, and the policy definition of poverty appears to be "fundamentally flawed" (Sen, 1981, p. 23).

In line with Sen (1981), Hagenaars, as the second stop of the journey, provides a detailed discussion of concepts of poverty. But one point to note is that whereas Sen (1981) approaches the five underlying concepts of poverty more from a subjective philosophical point of view, Hagenaars' categorization of the concepts has an objective perspective, emphasizing practical measurement issues.

According to Hagenaars (1991), defining poverty involves: identifying the unit of analysis such as individual, household, family, and country, and identifying the index that

categorises the unit as poor or non-poor. Additional information regarding extent of poverty of the unit would be considered a desirable trait of the index.

Hagenaars (1991) prefers to consider poverty at the household level as the members of the household share the products of their market labour as well as household labour. The state of the household would describe the state of each member of the household, that is, each member of a poor household would be identified as poor. This eliminates the possibility that in the same household there would be some members who are poor, and some non-poor. However, aggregation of poverty is considered at an individual level.

Hagenaars (1991) summarizes three concepts that are used to define poverty. These are – income, consumption, and welfare. These concepts help to develop the poverty index that is needed for measurement and aggregation purpose.

As Hagenaars (1991) puts it, income represents a budget constraint under which a household operates to fulfil its consumption choices. Using income as a basis for developing a poverty index seems ideal as income is measured on a cardinal scale that allows measurement of incidence, depth and comparison of poverty for different households. The poverty line, the level of income that separates the poor from the non-poor, can be defined once the concept of income is chosen.[2] Hagenaars (1991) reviews the existing literature to discuss various concepts of income. Annual cash household income is one such popular concept. A certain level of this annual cash household income is considered as a threshold (poverty line), falling below which would identify a household as poor. But annual cash household income accounts for actual current cash

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[2] A detailed discussion of poverty lines, using some of the approaches discussed here by Hagenaars (1991), is presented in chapter 3 as well.

income only and ignores potential or full income, lifetime income, non-cash income, earning capacities, utility or welfare, household production, and leisure.

On the other hand, a poverty definition based on consumption, as Hagenaars (1991) explains, looks at the consumption expenditure on certain goods. The poverty line in terms of income is actually drawn from the minimum amount of income needed to meet the expenditure on basic needs. This is something Sen (1981) discusses above while talking about the intermediary of income in the biological approach. According to Hagenaars (1991) the consumption based concept of poverty first requires determination of basic needs. Once that is done, the cost of meeting those needs is calculated. In order to determine the basic nutritional needs the minimum calorie intakes are first considered. These intakes are then converted into a minimum food basket. The cost of the food basket is then calculated. Other basic needs costs are calculated and then added to food cost to get the overall expenditure.

However, defining what constitute the basic needs is debatable - what should be included and what not, is controversial. Sen (1981) also highlights this problem above. Hagenaars (1991) quotes various authors who attempt to elaborate on basic needs. For example, Maslow (1954) talks about physiological needs, safety, belongingness and love, esteem and status, and self actualization as parts of basic needs. The conventional definition of poverty in an absolute sense may include physiological needs and safety as basic needs. According to Douglas and Isherwood (1979) such a definition would ignore goods "that service the mind and heart" (as cited in Hagenaars, 1991, p. 140). Townsend (1979), on the other hand, determines the basic needs in a relative sense and identifies someone as

poor if his or her consumption pattern falls below the consumption pattern of the society that is considered the norm.

Finding a uniform list of basic needs is a daunting exercise as the researchers tend to disagree on most accounts including minimum calorie intake, the starting point to construct the list. Hagenaars (1991) refers to Townsend (1962), Rein (1974), Hagenaars (1986), and Orshansky (1965) discussing this difficulty. Hagenaars (1991) also gives examples of various poverty lines. Orshansky (1965) provides one poverty line based on consumption. This line is absolute in nature. On the other hand, Townsend (1979) provides a consumption-based poverty line that is relative in nature. Watts (1967) provides another poverty line known as the food-ratio method. In this method, a certain food expenditure-income ratio is taken as a threshold and a family with an actual food expenditure-income ratio above the threshold is considered poor.

Hagenaars (1991) summarizes the consumption concept of poverty by identifying that consumption pattern may vary from household to household due to health, age, family composition and lifestyle, other than income. Consumption based poverty definitions and lines may not take these differences into account thereby identifying a family as poor, though the family has consciously chosen to consume in a particular manner.

Hagenaars (1991) points out that the main difficulty in using the idea of welfare as the basis for definition and measurement of poverty is in defining what reflects welfare best, and if income reflects welfare, the relationship between income and welfare. The author does not explicitly clarify welfare but states that the income and consumption expenditure

aspects of poverty in a way attempt to capture welfare by using income and expenditure as proxies.

As an alternative, Hagenaars (1991) discusses the Leyden School or Income Evaluation Theory, presented by Van Praag (1968), that allows defining and measuring poverty in terms of welfare by connecting various income levels to various welfare levels. This approach assumes that people are able to subjectively connect an income level with a certain level of welfare, the income level being expressed as "insufficient, "good", or "very good". As Hagenaars (1991) puts it

> It is assumed that the welfare level associated with 'just sufficient' is the same for all households, the differences in income levels household state are needed to reach this welfare level reflect differences in home production, leisure, social reference group, and household size and composition. (p. 143)

The poverty line according to this approach can be defined as an income level that people consider somewhere between "sufficient" and "insufficient", the latter two words expressing certain welfare levels. Whereas the income approach is based on the objective judgement of the researcher in identifying an income based poverty line, this welfare approach leans on subjective judgement of people about a certain income level denoting a certain welfare level

According to Hagenaars (1991) the major limitation of this type of welfare approach is that it ignores many sociological and psychological factors that can affect welfare, apart from defining the poverty line in a subjective manner in terms of welfare. Being subjective, many of these factors are subject to measurement problems.

In summary, according to Hagenaars (1991), the income approach to poverty defines income in a restricting manner and ignores factors like permanent income, leisure, household production and other non-cash income affecting households' wellbeing. The consumption approach ignores the differences in consumption behaviour due to differences in health, age, life style etc. The welfare approach is limited by difficulty in drawing a relationship between income and welfare, difficulty in acknowledging other psychological and sociological factors that can affect welfare and by the subjective nature of welfare and factors affecting welfare.

Acknowledging these shortcomings, Hagenaars (1991) asserts that choice of poverty definition does matter. The choice should be based on the economic situation of the country being studied. For a poor country an absolutist basic need approach is more pertinent. On the other hand, for a rich western country a relative approach to poverty would make more sense as this would allow taking into account changes in necessities over time and place. If a country is consistently ranked as poor by using different poverty lines, the definition of poverty would not be much relevant. On the other hand, for a particular country at a given point in time the choice of approach is relevant.

From the discussions so far it can be observed that Sen's delineation of the biological approach finds resonance in Hagenaars' income and consumption approaches. Apart from that, Sen's views on poverty as relative deprivation, inequality, value judgment and policy definition are not discussed by Hagenaars. On the other hand, the welfare approach elaborated by Hagenaars is absent in Sen's discussion. While Sen introduces relative deprivation as a separate concept of poverty, Hagenaars discusses absolute and relative deprivation while discussing income and consumption concepts of poverty. Sen considers

relative deprivation as a core concept (poverty is relative deprivation) and negates it as a stand-alone concept, whereas Hagenaars considers relative (and absolute) deprivation as an integral part of income and consumption concepts of poverty (poverty is lack of income or consumption with reference to a poverty line, and this lacking has a relative and an absolute aspect.). Furthermore, while discussing problems of the biological and consumption approach to poverty, both the authors highlight the point about differences in household consumption behaviours leading to difficulty in constructing a minimum consumption basket. Discussion of Sen and Hagenaars, written within a ten year interval, help us in narrowing down the scope of the earlier conventional discussion of poverty within the boundaries of biological, income and consumption based approaches, supplemented by the relative deprivation approach.

Blackwood and Lynch (1994) in their brief review of various definitions of poverty also highlight the conventional income, consumption and biological approaches by referring to authors like Ojha (1970), Reutlinger and Selowsky (1976) and Musgrove and Ferber (1976).

Apart from these common views, Blackwood and Lynch (1994) discuss some other views which are broad. For example, Singer (1975) finds poverty to be dependent on education, health, life expectancy and child mortality. Streeten (1979) considers various physical needs (food, healthcare, education, shelter) and non-physical needs (participation, identity) as part of the basic needs and fulfilment of all these is essential for a "meaningful life" (Blackwood and Lynch, 1994, p. 568). Another broad view of poverty by Sen (1981) is the entitlement approach where poverty is seen as an entitlement failure.

Entitlement refers to an individual's command over goods and services, taking into account the availability and the means to acquire these goods and services.

After presenting these varied views on poverty, Blackwood and Lynch (1994) concludes that "a concise and universally accepted definition of poverty is elusive" (p. 568).

The broadening of the concepts of poverty over time, touched on by Blackwood and Lynch (1994) above, is further elaborated by Kanbur and Squire (1999), the next stop of the journey. In their review of the poverty literature, Kanbur and Squire (1999) talk about the conventional income and consumption approaches, and also the inequality approach to poverty highlighting various issues involved. They also talk about some of the broad concepts of poverty that involve literacy, life expectancy, risk and vulnerability, and lack of power and voice. Such broadening of the concepts of poverty, as the authors assert, does not notably change identification of poverty, but does allow better understanding of poverty. Furthermore, these broad concepts extend the set of policies needed for poverty eradication, and make room for interactions among the policies.

While discussing the income and consumption approaches to poverty, Kanbur and Squire (1999) stress that according to various studies the poverty line changes over time and from society to society. Such changes are primarily due to three factors: improvement in the general standard of living and technological developments making luxuries necessary, changes in social organizations, and changes in social standards making things more expensive for the poor.

Using the a-dollar-a-day poverty line as an example, Kanbur and Squire (1999) list some of the shortcomings of this type of expenditure based poverty line: differences in cost of

living within countries are not accounted for, "chronic" and "transient" poverty are not distinguished, only marketed goods are valued, intra-household expenditure distribution is not considered, and only household size and compositions are addressed. Despite all these limitations, Kanbur and Squire (1999) see nothing wrong in using this type of a-dollar-a-day poverty line as a standard since we are already plagued with various other measurement errors due to differences in survey techniques, samples, timing and so on.

Preciseness of poverty measurement in terms of the poverty line becomes more significant, as Kanbur and Squire (1999) point out, while designing poverty eradication plans of a particular type. As prices faced by the rural and urban population are quite different, it is not unjustifiable to have two different poverty lines for these two groups of population taking into account differences in cost of living. The authors argue this would facilitate a more focused designing of an action plan for poverty elimination. Similarly, a poverty line may also need to account for the fact that there are differences in accessing goods and services that are not marketed. Between two equally poor households, one may be in a better position compared to the other because the former has better access to government subsidized health services. Again, between two equally poor households, the one that is in chronic poverty should get priority compared to the one that is falling into poverty occasionally. Also, what needs to be seen is the distribution of income and expenditure among the members of each household. In each of these cases, the authors note, the policy response would be different for these two families.

According to Kanbur and Squire (1999) those who see poverty as a lack of income, would support a poverty alleviation strategy focusing on growth in per capita income. What needs to be seen is if this income growth is accruing to all the individuals in society

in an equitable manner. By referring to various studies, Kanbur and Squire (1999) suggest that mere income growth (across countries and over time) does not necessarily imply equality in income distribution as the popularly known Kuznets curve would have implied, and improvement in income distribution does not always lead to poverty reduction. "Inequality and income are not systematically related according to some immutable law of development" (Kanbur and Squire, 1999, p.7). This is something Sen (1981) also suggests in his discussion as we have seen above. However, as Kanbur and Squire (1999) point out, some recent studies show that reduction in initial inequality affects future growth in income both ways – negatively and positively.

Kanbur and Squire (1999) further assert that (though it is difficult to find a 'mechanical link' between inequality and income), growth and inequality are outcomes of economic policies and institutional capacities, apart from various exogenous factors. Therefore, policies should focus on increasing growth as well as ameliorating inequality at the same time, though the growth rate could be more sensitive to policies than inequality. Kanbur and Squire (1999) conclude the discussion on income and consumption approaches to poverty by saying that "A strong growth performance with even a relatively modest reduction in inequality will have a tremendous impact on the incomes of the poor" (p. 9). Here we see that, though Sen (1981) is not much in favour of considering inequality as part of poverty, Kanbur and Squire (1999) are in favour of those economic policies that enhance growth and reduce inequality.

In discussing some of the broad concepts of poverty, Kanbur and Squire (1999) broach the human development concept. The conventional measures of poverty discussed above are not able to reflect standard of living appropriately as these measures cannot account

for factors like heath, nutrition, education and many other (subsidized) public goods. The authors maintain that income is a significant indicator of poverty and can contribute to accessing the above factors, but that does not necessarily need to be the case always. Therein lies the importance of looking into the other factors directly. The capability approach to poverty by Sen (1995), discussed elsewhere, focuses on this aspect of poverty.

Kanbur and Squire (1999) give credit to the United Nations Development Programme for coming up with an index to measure non-income aspects of poverty. The index is known as Human Poverty Index (HPI) that focuses on longevity, literacy and living standard. Longevity is measured by the percentage of people who die before the age of forty, literacy is measured by the percentage of literate adult population, and living standard is measured by the percentage of population having access to health services and safe water, and percentage of malnourished children under the age of five.

As the authors describe, the main problem with this index is in aggregation that requires arbitrary weights being assigned to the components. Furthermore, this index does not say anything about the number of poor people in the conventional sense. However, Kanbur and Squire (1999) refer to some studies which found that countries that were poor in the conventional expenditure sense also did badly in terms of the HPI. The authors stress that the HPI is good at ranking various countries of the world in terms of human development. They also highlight the point that a country doing well in some aspects of human development, may not be doing well in other respects. Despite these limitations, the authors assert, such human development based poverty concepts allow us to address issues ignored by the income or consumption based poverty concepts, and caution us

about possible interrelations among the elements of human development and consequent policy ramifications.

In their review, Kanbur and Squire (1999) indicate that human development and income earning capacity are closely related, the latter being the determinant and outcome of the former, and maintain that "provision of basic social services, besides being important in its own right, constitutes an important element in the growth of a society" (p. 14). This provision is needed due to the fact that higher income does not necessarily get translated into, say, better health and educational attainments and vice versa. The authors argue that this happens, on the one hand, if increase in income does not lead to poverty alleviation and reduction in inequality, and if investments are not made in sectors like health and education. On the other hand, if investment in health and education mainly benefits the non-poor through rent-seeking due to absence of proper incentive structure and complementary investment, there might be an increase in individual income but an insignificant increase in national income as a whole. However, the authors indicate that there are examples from some East Asian countries where these shortcomings were overcome to the greater advantage of the poor.

In concluding the discussion on human development, Kanbur and Squire (1999) reiterate the strong interaction between human development and income growth, and assert that incorporating various aspects of human development into the definition of poverty expands the scope of poverty alleviation policies and policy instruments. As the authors say "where policies and programmes to improve health and expand education are combined with government action designed to promote investment and broad-based growth, the benefits to the poor are that much greater" (Kanbur and Squire, 1999, p. 15).

Discussion by Hagenaars (1991) on the Leyden School approach to poverty is presented above. In their discussion of broad concepts of poverty, Kanbur and Squire (1999) talk about participatory poverty assessments which are an improvement upon the Leyden School in the sense that these assessments are "much more open ended, interactive and qualitative and allow people to describe what constitutes poverty in whatever dimension they choose" (p. 15).

Kanbur and Squire (1999) say that this approach to poverty is based on people's perspective about their own poverty status, poverty elimination strategies of the government, success and failure of these strategies, and preference for any particular strategy. These participatory assessments are likely to coincide with the conventional approaches to poverty in terms of outcome. Furthermore, "participatory poverty assessments pay special attention to process with the aim of engaging a range of stakeholders, generating involvement, maximizing local ownership and building commitment to change" (Kanbur and Squire, 1999, p. 15).

In the 1990s, the World Bank did a series of participatory assessments. According to Kanbur and Squire (1999), two unique aspects transpire from these assessments. One is "concern with risk and volatility of incomes" leading to "feeling of vulnerability", and the other is "lack of voice and political rights". Vulnerability and powerlessness are the aspects not captured by conventional approaches to poverty.

Borrowing from the existing literature, Kanbur and Squire (1999) explain vulnerability as having two aspects. One is the exposure to extraneous shocks, stresses and risks such as natural calamities, war, and violence. The other is the lack of means to deal with such

distresses. Such lacking makes the poor more susceptible and consequently poorer. Apart from jeopardizing their possessions, vulnerability engages the poor in low-risk low-return activities, thereby sustaining the poverty cycle. A lack of means makes coming out of the poverty cycle even more difficult.

Kanbur and Squire (1999) conclude by highlighting that incorporating vulnerability and powerlessness into the definition of poverty allows inclusion of the economically and socially marginalized groups living at or beyond the margins of the community. "Economically and socially marginalized groups" are the ones close to the poverty line but not technically poor and excluded by various other conventional definitions of poverty. The idea of vulnerability would take into account various extraneous shocks that can push these marginal groups into poverty.

Such incorporation provides better understanding about poverty, and allows for picking the right combination of policies for poverty alleviation. But like any other approach, Kanbur and Squire (1999) note, this approach has a practical limitation due to the fact that household level measures of vulnerability and powerlessness are not easily available.

In their concluding remarks about all the approaches, Kanbur and Squire (1999) assert that all these different approaches are less likely to have diverse results. In fact, studies do show that the differences are not that big. The main appeal of the broad approaches to poverty lies with policy implications – the broader the definition of poverty, the more the policy instruments needed for alleviation. When the focus is on income based poverty, the policies call for growth in income and improvement in distribution. When the focus simultaneously is on factors like health, education, vulnerability and power, policies need

to address these other dimensions as well as participation of the poor in the poverty elimination process.

Whereas Kanbur and Squire (1999) consider vulnerability as one aspect of poverty and thereby make the scope of poverty broader, Coudouel, Hentschel, and Wondon (2002), representing the World Bank's view on poverty, take a different stance in defining poverty. According to the authors, poverty is one major dimension of well-being of individuals and households. Inequality and vulnerability are the other two dimensions. According to the authors, poverty is related to individuals' or households' not possessing enough resources or abilities to meet current needs. Income, consumption, education, and many other features fall under the purview of resources and abilities, and individuals and households falling below a certain threshold for a particular feature are considered poor. This is another good example of how views on poverty have changed and broadened over time since discussion by Sen (1981).

Coudouel et al. (2002) underline three aspects needed for understanding poverty: The dimensions of poverty, the threshold of poverty and measurement of poverty.

The dimensions of poverty, according to the authors, can be of two types – monetary and non-monetary. Monetary dimension involves poverty in terms of income and consumption that are discussed above by Sen (1981), Hagenaars (1991), Blackwood and Lynch (1994) and Kanbur and Squire (1999). On the other hand, in the view of the authors, the non-monetary dimension of poverty includes inadequacies in areas such as health, nutrition, literacy, social relations, security, self-esteem and power that are also addressed by Sen (1981), Hagenaars (1991), Blackwood and Lynch (1994) and Kanbur

and Squire (1999) . Some of these variables of nonmonetary poverty can be measured by the standard tools used in measuring monetary poverty. Like monetary poverty, a threshold is first determined and then values of these variables for an individual or household are compared against the threshold falling below which indicates poverty.

According to Coudouel et al. (2002), consumption is considered a better monetary dimension of poverty as opposed to income for the following reasons:

- Consumption allows a more direct picture of meeting the minimum requirements. Income on the other hand is only one means of fulfilling the minimum requirement; access and availability are other issues.

- For poor agrarian economies, rural income is a fluctuating variable that varies with harvesting seasons. In urban economies, where the informal sector is a big share of the economy, income can be quite inconsistent. As a result, income surveys would give unreliable data. Furthermore, if most of the consumption is based on non-marketed goods, income will not be a good reflection of ability to fulfil basic needs.

- Consumption expenditure gives an idea about how much a household is able to command on the basis of its own income, as well as, access to credit market and one's own savings.

This World Bank view of poverty is further emphasized by Haughton and Khandker (2009), as they define poverty as "pronounced deprivation in well-being" (p. 2), and poor are those who fall below a certain threshold of income or consumption due to lack of command over resources. This underscores the straight forward monetary view of

poverty discussed above. On the other hand, one can consider poverty in terms of food, health, and education, and measure directly the deprivation by looking at malnutrition, and illiteracy, and not necessarily income. This asserts the non-monetary view of poverty.

From the discussions so far, it can be concluded that the conventional biological approach to poverty interpreted through the intermediary of income discussed by Sen (1981), and the income and consumption approaches elaborated by Hagenaars (1991), Blackwood and Lynch (1994) and Kanbur and Squire(1999) can be likened to the monetary approach to poverty as discussed in the World Bank literature. On the other hand, the direct biological approach (nutritional needs) to poverty, human development approach and vulnerability and powerlessness can be seen as examples of the non-monetary approach. Some of the other conventional yet less popular approaches such as inequality, relative deprivation, value judgement, policy definition and welfare approaches can be considered under the monetary approach. Some of the other concepts and definitions discussed elsewhere in this section and in the following section can also be categorized in a similar manner (see Table 2.1).

2.1.2 Alternative Concepts of Poverty

In this section some of the relatively newer and broader concepts of poverty such as the capability approach, multidimensionality, social exclusion and the human rights approach are discussed with their pros and cons. All these approaches look beyond the conventional income and expenditure approaches and propose a comprehensive view of poverty. In the end of this section a brief discussion on future directions of research on poverty is presented.

2.1.2.1 Capability Approach

In the mid-eighties A. K. Sen introduced a broad-based concept of poverty known as capability deprivation. According to this approach, Sen (1995) sees poverty as "the failure of some basic capabilities to function" (p.15). An individual is considered poor if he or she fails to attain minimum acceptable levels of the functionings. Sen (1995) provides some examples of functionings such as being adequately nourished, clothed, and sheltered, avoiding morbidity as well as " taking part in the life of the community, being able to appear in public without shame" (p.15).

In his review of the poverty literature, Osberg (2007) presents a discussion of this approach to poverty by explaining that people consume commodities for certain characteristics they possess that allow people the capability to do certain things and function as human beings. As Osberg (2007) states, according to Sen (1999),

> What the capability perspective does in poverty analysis is to enhance the understanding of the nature and causes of poverty by shifting the primary attention away from means (...viz., income) to ends that people have reasons to pursue, and, correspondingly, to the freedoms to be able to satisfy these ends. (as cited in Osberg, 2007, p. 27)

This freedom refers to capability.

In order to distinguish poverty as capability deprivation from poverty as lack of income, Sen (1999) makes three points:

- The capability approach looks at 'intrinsically' important elements in understanding poverty, whereas the income approach looks at 'instrumentally' important element, that is, inadequate income.

- Income is one instrument influencing capability, but there are other factors that influence capability.

- How income affects capability and how income is converted to capability depend upon various factors such as age, gender, social roles, locations, epidemiological atmosphere, disability, income distribution, and some other factors.

Sen (1999) emphasizes that improvements in capabilities can lead to increase in productivity and income, and consequently to reduction in income poverty. Therefore, the lowering of income based poverty only should not be the final objective of any poverty elimination plan. It should be broad enough to address human capability issues.

Osberg (2007) highlights some of the shortcomings of the capability approach. First of all, the capability approach to poverty is not operational because of the absence of an acceptable list of valuable capabilities. Though Sen provided some examples, he did not attempt to specify a list of capabilities that can be used for poverty measurement. Some researchers, according to Osberg (2007), have worked with this concept with their own interpretations of capability, but such works lack the consistency needed for comparability.

The second shortcoming that makes the approach non-operational is that the approach is concerned with offered options or choices (opportunity sets), not only observed choices

(outcomes). For this reason, some measure of "unobserved" opportunity sets is needed, but statistical data only give information on observed outcomes actually experienced.

Third, in order to achieve some capabilities like literacy and health, the commodities such as schooling and medical care are needed earlier in time. Such a time lag between the commodities being consumed and capabilities being achieved for the functionings could become crucial in analysing some aspects of poverty such as child poverty.

2.1.2.2 Multidimensionality

Referring to Tsui (2002), Osberg (2007) in his review discusses the multidimensional approach to poverty that takes into account the functionings achieved as opposed to the complete opportunity set of functionings available to an individual according to the capability approach.

As Tsui (2002) puts it, according to the multidimensional poverty literature "human deprivation is visualized not through income as an intermediary of basic needs but in terms of shortfalls from the basic needs themselves" (as cited in Osberg, 2007, p. 29). But according to Atkinson (2003) if a family is poorly housed due to lack of income, looking at income should be sufficient to get an idea about poverty. There is no need to look separately at the shortfall from the basic need of housing (as cited in Osberg, 2007).

Osberg (2007) reasons that as long as most goods and services are available in the market, multidimensional poverty measures would be less likely to add any extra information beyond what family income based poverty measure can. However, he also stresses that in case of inequality within the family in terms of gender and age, non-market transfers of income can take place between family members distorting the poverty

picture, and in such a context looking beyond income would provide a better picture of poverty. Here lies the importance of the multidimensional approach over the traditional income approach to poverty.

Osberg (2007) points out that the main challenge with this approach is how to determine the specifications on the basis of which poor individuals are identified and aggregated. According to this approach, a minimum requirement level needs to be determined for each dimension of wellbeing, and Osberg (2007) rightly opines that "there is little reason to think that there would be any more unanimity, on each dimension considered, than there is concerning the money income poverty line" (p. 23).

According to Osberg (2007) the next challenge for this measure for an individual to be considered poor is to determine whether deprivation should be in every dimension, or just one.

Osberg (2007) names some of the major contributors to multi-dimensional poverty literature: Atkinson (2003), Bourguignon and Chakravarty (2003), Duclos et al. (2006) and Tsui (2002). The principal contribution of this approach is appreciated when very little correlation is found among various dimensions. In case of correlation, further research would be required to find the possible factors.

2.1.2.3 Social Exclusion

According to Atkinson (1999) social exclusion means "people being prevented from participation in the normal activities of the society in which they live or being incapable of functioning" (as cited in Osberg, 2007, p. 31). Chakravarty and d'Ambrosio (2006) view social exclusion in three ways: "... lack of participation in social institutions; ...

denial or non-realization of rights of citizenship, (and) ... increase in social distance among population groups" (as cited in Osberg, 2007, p. 32).

Sen (2000) gives credit to Lenoir (1974) for first coining the term social exclusion. According to Lenoir (1974) excluded are those who are

mentally and physically handicapped, suicidal people, aged invalids, abused children, substance abusers, delinquents, single parents, multi-problem households, marginal, asocial persons, and other social 'misfits'. (as cited in Sen, 2000, p.1)

Sen (2000) points out that Silver (1995) has extended this group of excluded by considering exclusion from

a livelihood; secure, permanent employment; earnings; property, credit, or land; housing; minimal or prevailing consumption levels; education, skills, and cultural capital; the welfare state; citizenship and legal equality; democratic participation; public goods; the nation or the dominant race; family and sociability; humanity, respect, fulfilment and understanding. (as cited in Sen, 2000, p.1)

According to Sen (2000) the concept of social exclusion is related to ideas of poverty and deprivation, and the literature on social exclusion is better understood in the broader context of poverty as capability deprivation.

As Sen (2000) puts it, poverty should be seen in the broader context of poor living. Lack of income could be a major contributing factor in indigent living, but not the only one. The capability approach to poverty sees poverty as the lack of the capability to live a life that is not impoverished, a life that is "minimally decent". If an individual is not able to

participate in social life without shame, that is considered a capability deprivation. This deprivation, this inability to participate, takes the form of social exclusion. Thus social exclusion, according to the author, is seen as part of the capability deprivation.

Furthermore, as Sen (2000) points out, social exclusion can lead to various other forms of capability deprivation. Inability to participate in society leads to social exclusion that leads to other forms of capability deprivation. Capability deprivation in the form of lack of employment may lead to economic impoverishment that can lead to other forms of capability deprivation such as malnourishment, or homelessness. Social exclusion, thus, can be a constituting part of capability deprivation as well as a contributing factor to various forms of capability deprivation. Social exclusion can be seen as an approach to poverty when poverty is seen in the broader context of capability deprivation, Sen (2000) asserts.

Sen (2000) opines that the concept of social exclusion does not add anything new to the concept of poverty as capability deprivation, but does provide useful insights into understanding poverty. It consolidates, rather than contends with, the concept of poverty in terms of capability deprivation.

Estivill's (2003) view about social exclusion is worth noting here:

despite the ambiguities of the concept of exclusion, it supplements that of poverty, facilitates a better understanding of income insecurity in the developed world and of inequality of opportunity in developing countries, focuses attention on the role of social actors and institutions in processes of inclusion, permits the application of individual, family and community relations at the micro-level, and shows the

importance of local contexts, while at the macro-level it offers a new vision of globalization and of the increasing vulnerability of specific population groups and areas. (as cited in Osberg, 2007, p.35)

In his review Osberg (2007) draws out some commonalities from various interpretations of social exclusion: the concept of social exclusion is multidimensional requiring mixed indicators to assess exclusion both in qualitative and quantitative terms. Social exclusion is a long-term phenomenon, works in a vicious-cycle manner and does not focus on purely personal characteristics.

In distinguishing income and capability approaches to poverty and social exclusion, Osberg (2007) uses an example of transportation and shows that the income approach does not focus on any particular issues. If a poor family is not able to obtain something (like transportation), it is mainly due to lack of income. Availability is not seen as an issue. On the other hand, the capability approach takes a broader view of the matter and takes into account an individual's financial resources, personal characteristics, as well as social context, the former two being more important. The social context is assigned more value in the social exclusion approach.

In making the social exclusion approach operational, Osberg (2007) says that

In principle, geo-coding of micro-data and data linkage across surveys can go a long way towards making measures of social context possible – e.g. in linking individual and household characteristics and outcomes to the public transportation available in their community of residence. However, this will only be feasible if privacy concerns are satisfied at the data processing stage. (p. 33)

Furthermore, the author points out, the social exclusion literature has not yet come up with an acceptable complete list of dimensions of social exclusion.

2.1.2.4 Human Rights

In his review Osberg (2007) discusses the approach that sees poverty as a deprivation of human rights. Article 25 of UN Universal Declaration of Human Rights (1948) links human rights and poverty in the following manner:

> Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control. (as cited in Osberg 2007, p. 35)

The Universal Declaration of Human Rights is a part of The International Bill of Rights that also includes The International Covenant on Economic, Social and Cultural Rights, and The International Covenant on Civil and Political Rights. Osberg (2007) highlights that these three documents together define human rights and freedom.

According to Osberg (2007), the human rights approach to poverty has an advantage over the capability, multidimensionality and social exclusion approaches because of the specificity of human rights, and the constitutional legitimacy these rights have through legislative underpinnings. This legal specificity makes the measurement of poverty as deprivation of human rights operational.

Measuring poverty with respect to human rights, however, poses two problems: if rights are violated in some respect, and not in others, should this be considered an overall deprivation, and if so, how would aggregation proceed in such a case?

2.1.2.5 Future Directions

Kanbur (2003) discusses some of the future directions the concept of poverty may take in the coming years. The author sees evolution of views on poverty and inequality in two phases. For this purpose, he arbitrarily chooses 1970 as the starting point. From 1970 through the mid 1980s, major conceptual contributions to the literature of poverty and inequality took place, and the following fifteen years mainly experienced application of these concepts and policy debates revolving outcomes of the applications. The conceptual advancements took place in four areas – measurement of poverty and inequality, debate on utilitarianism, gender and intra-household issues and social interactions. What Kanbur (2003) sees as possible future developments in the conceptual evolution of poverty and inequality are: consideration of death in poverty measurement, consideration of behavioural economics in explaining poverty and inequality, and consideration of aggregating the multidimensionality of poverty. These directions are briefly discussed below.

Kanbur (2003) argues that Africa is the continent that is the hardest hit by the disease AIDS. If the deaths due to this disease are not properly recorded, many countries of Africa may end up having declines in poverty simply due to the death of the poor. Current poverty measurement tools are not well equipped to account for these deaths. As Kanbur (2003) puts it

Current conceptualizations of poverty measurement focus (somewhat unthinkingly) on those currently alive, whereas death rates from AIDS will force us to consider the lives extinguished of those who have just died. Our conceptual tools do not seem to be adequate to the task. (p. 6)

Another aspect Kanbur (2003) highlights is that the poverty literature is based on the rational choice perspective. This is evident from the fact that expenditures on consumption are considered to be encapsulating wellbeing. This implies, for instance, that an increase in the consumption of cigarettes, an addiction of disastrous consequences, would indicate a reduction of poverty!

Kanbur (2003) maintains that considering a composite index like the HDI (Human Development Index) does raise awareness about health and education along with income, but if improvements are noted on one front and not on the other two, it is difficult to conclude anything about poverty reduction. It is also difficult to aggregate the movements in the dimensions of the index. Though Sen's capability approach provides a lead to these problems, it does not provide a complete solution. As Kanbur (2003) indicates "economists have not been as successful as they might wish to be in conceptualizing and then operationalizing the simultaneous evaluation of different dimensions of well-being, despite the remarkable efforts of some" (p. 8).

2.1.3 Absolute and Relative Poverty

In poverty literature the debate on absolute and relative poverty is a recurring one. Absolute poverty looks at deprivation as an inadequacy to meet minimum basic needs for survival, whereas relative poverty considers deprivation in relation to social standards of

the time that define the needs, standards that change with time and place. This section reviews the existing literature in a bid to clarify these two aspects of poverty.

We have seen before that Sen (1981) does not favour the idea of looking at poverty from a relative perspective alone. He prefers to take an absolutist approach to poverty and considers relative poverty as a supplement to the discussion. In a later work, Sen (1983) promotes his preference strongly.

Though he acknowledges that using the concept of relative deprivation in poverty analysis in the developed countries has some value, Sen (1983) favours using an absolute approach to poverty where the specification for absolute poverty has some relative elements built into it. He also affirms that absolute deprivation in the realm of capabilities leads to relative poverty in income, commodities and resources.

Sen (1983) argues that the relative approach to poverty has a tendency to assume basic needs as fixed under the absolute approach. But that is not the case. Sen (1983) iterates that even under the absolute approach, the minimum basic needs or the poverty line is considered to be a function of certain variables that change over time, giving the poverty line a relative twist.

Sen (1983) connects the concepts of relative and absolute poverty with his capability approach to poverty discussed earlier. The author defines the standard of living as dependent on the capability to function. Absolute poverty is the absolute lack of capability to function, and relative poverty refers to the differences in the functionings from one society to the other. Sen (1999) further adds

Relative poverty in terms of incomes can yield absolute deprivation in terms of capabilities. Being relatively poor in a rich country can be a great capability handicap, even when one's absolute income is high in terms of world standards. In a generally opulent country, more income is needed to buy enough commodities to achieve the same social functioning. (p. 89)

Sen (1983) maintains that focusing on relative poverty poses a problem for poverty elimination programmes as the standard of living changes over time and place. This implies that there will always be a group of people that is relatively poor. Moreover, with a major economic decline when all people become poorer than before, relative poverty may not change despite the increase in absolute poverty evidenced by economic hardship and even starvation. Consideration of relative deprivation thus wrongly pushes poverty analysis to the realm of inequality, something that Sen (1983) opposes. We see this opposition in previous discussion of Sen (1981) on inequality.

Sen (1983) reasons that there is an 'irreducible absolutist core' in poverty that cannot be captured by the relative perspective. When there is starvation and malnutrition, this is an indication that there is absolute poverty, no matter what the relative state of poverty looks like. However, the author does agree that "While it might be thought that this type of poverty – involving malnutrition and hunger – is simply irrelevant to the richer countries, that is empirically far from clear, even though the frequency of this type of deprivation is certainly much less in these countries" (Sen, 1983, p. 159).

Hagenaars (1991) brings up the issue of absolute and relative poverty while discussing the poverty line in his review of poverty literature. In his view absolute poverty refers to a

state of not being able to meet basic minimum requirements of life, and the absolute poverty line is the fixed level of income that is needed to meet those basic food and non-food requirements for survival. This line does not depend on the income distribution of the society, and can be determined either by a general understanding of or by research on how much income is needed to make ends meet. Relative poverty, on the other hand, refers to deprivation in relation to other members of society. The relative poverty line is drawn from the income distribution of the society and reflects the relative state of deprivation, rather than the absolute.

Hagenaars (1991) argues that when a relative poverty line in terms of some percentage of median income is considered, the reduction of poverty requires reduction in income inequality, whereas when an absolute poverty line is considered, reduction of poverty requires poor people to cross the line through growth in income.

Hagenaars (1991) maintains that for the developing countries struggling to fulfill the basic requirements, consideration of an absolute definition of poverty is appropriate. On the other hand, for Western developed countries a relative definition would be more appropriate to take into account changes in standard of living over time and place.

Coudouel et al. (2002) also agrees with the above argument. According to the authors, as most of the developing countries are toiling to meet basic needs, it is reasonable to use an absolute poverty line for poverty measurement for these countries as opposed to the relative poverty line that takes into account the current distribution of income. The authors argue that there might be an element of arbitrariness in choosing one poverty line

over the other, but the line should be determined by taking into account current social norms and understanding about what should represent a bare minimum level of income.

Osberg (2000) has a similar tone in explaining absolute and relative poverty. In his opinion, the difference between relative and absolute poverty lies in the transparency of these two approaches. The author argues that the absolute approach ties the poverty line to a specific market basket of goods and services that can fulfill minimum needs, whereas the relative approach clearly ties the poverty line to some aspects of distribution of income, for example, a certain percentage of median income. However, Osberg (2000) notes, when the absolute approach is revised it gets implicitly linked to some prevailing income distribution and hence becomes a relative standard to some extent but not in a clear-cut way. He further indicates that determination of the absolute poverty line is often influenced by the prosperity of the researcher, the judgement of the researcher about minimum requirements, and the place of the researcher in the overall social structure. The relative approach is "explicit, continuously updated and standardized", whereas the absolute approach is not – it is rather "implicit, occasional and idiosyncratic" (Osberg, 2000, p.5), thereby losing the transparency compared with the relative approach. The preference of Osberg (2000) for the relative poverty concept is just the opposite to what Sen (1981) prefers.

Resonating some of the authors above, CCSD (2001) also favours relative poverty measures for the industrialized, developed countries due to a high level of average income compared to the developing countries. An individual in a developed country is poor not because he/she is unable to meet the basic needs, but because he/she is not able to attain the standard of living that most people in the society are able to attain.

The fact that the line between absolute and relative poverty is quite thin was made clear more than two hundred years ago. in 1776, by Smith (1872) is his definition of 'necessaries':

> By necessaries I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it indecent for creditable people, even the lowest order, to be without. (p. 693)

According to the above definition, necessaries are identified not only by looking at items absolutely needed for survival, but also by looking at prevailing social standards that may redefine necessaries with change in time. So consideration of one aspect of poverty completely devoid of the other is less than enlightening.

2.1.4 Concluding Remarks

In the above discussions, various conventional and non-conventional concepts of poverty, that take monetary or non-monetary perspectives, are presented. Some of these concepts are no longer relevant, whereas some are. Some of the relevant concepts such as income and expenditure approaches are routinely used in measuring poverty these days despite some limitations, whereas some of the other relevant concepts – such as human development, vulnerability, capability, multidimensionality, social exclusion, and human rights approaches are not yet fully operational mainly due to lack of data and some technical aspects of measurement discussed above. The debate around absolute and relative poverty is also a pervasive one, and most authors tend to lean towards the relative aspect in measuring poverty in developed countries. However, the arguments in favour of absolute poverty cannot be ignored. By keeping in mind relevance and practicality, this

research considers monetary definitions of poverty based on income, and the absolute and relative aspects of poverty. From the next chapter onwards, unless otherwise mentioned the word poverty refers to an income-based monetary poverty concept.

2.2 Income Inequality

Osberg (1981) provides a definition of economic inequality in his book on economic inequality in Canada. In his words "The most straightforward definition of economic inequality is probably, 'differences among people in their command over economic resources'" (Osberg, 1981, p. 1).

Osberg (1981) argues that equality as a concept is similar to but not the same as the concept of equity. The latter one is more of a reflection of the social institutions of the time. Equality as a concept is not above debate. How would one define equality – in terms of income, in terms of opportunity or in terms of entitlement to consideration and respect? How would one define the extent of inequality – in terms of differences between the lower end and the middle group of a distribution, or consider the upper end in place of the lower end? Which variables and measures to choose for analyzing inequality? Answers to these questions will eventually depend on one's values regarding where society should be as opposed to where society is.

Osberg (1981) iterates that income inequality is only a part of economic inequality. Understanding of income inequality requires defining income and its distribution, identification of the unit of measurement, that is, family or individual, and measurement of inequality in the distribution.

In discussing measurement of income inequality, Cowell (2000) says that

Inequality measurement is an attempt to give meaning to comparisons of income distributions in terms of criteria which may be derived from ethical principles, appealing mathematical constructs or simple intuition. In this respect, it is similar to other methods of characterizing and comparing income distributions to which it is closely related. (p. 89)

According to Atkinson (1970) measures of income inequality are needed for various purposes - to compare changes in a distribution of income over time, to compare changes in income distributions of various groups of the population, to identify factors affecting income distribution, and of course to quantify the changes. Dalton (1920) highlighted the fact that underlying any measure of inequality is a concept of social welfare. (as cited in Atkinson, 1970)

In line with Osberg (1981), Jenkins (1991) also defines inequality in terms of "differences across the population in access to, and control over, economic resources" (p. 4). He emphasizes that the analysis of inequality and poverty requires appropriate explanation of the distribution involved. There are few steps in explaining the distribution. First, the variable of the distribution needs to be defined, for example, income. Then the demographic unit related to the variable and the distribution need to be identified, and finally, it needs to be ensured that the variable is comparable across the demographic units.

Moreover, according to Jenkins (1991), the analyses of inequality attempts to resolve two major concerns – ranking of two or more distributions in terms of inequality, that is, whether one distribution is more or less equal than another distribution, and quantifying

the inequality, that is, how much more or less unequal one distribution is compared to another distribution. In the first case an ordinal measure of inequality is needed, whereas in the latter case a cardinal measure of inequality is required.

Like the previous authors, Jenkins (1991) argues that income is the most commonly used variable in inequality analysis. However, the definition of income can be quite varied and which definition to adopt will depend on the objective of the research and availability of data. Furthermore, the time period over which income is measured is another point of concern as a longer time period tends to smooth out the fluctuations in income. In order to choose the appropriate time period, two aspects need to be considered – how income fluctuates over time and whether the fluctuations cause the income to fall below an acceptable minimum level.

Jenkins (1991) maintains that, apart from definition and time period, the demographic unit related to income needs to be identified right in the beginning –whether the analysis is looking at individual income, family income or household income. The author points out one associated problem with this aspect of the analysis - considering per capita family or household income as equivalent to individual income. Such consideration assumes equal sharing of income among the family members, which may not be actually the case. To avoid this problem, an "equivalence scale" is used. This scale is obtained by assigning different weights to different members of the family on the basis of their age, and allows deflating the family income more appropriately by taking into account the composition of the family in terms of adults and children. The deflated income is called equivalent income and is obtained by dividing observed income of a household by the equivalence

scale value for that type of household. However, determination of the scale is also debatable since consumption patterns can vary across families.

In a more elaborate discussion of inequality, Champernowne and Cowell (1998) define economic inequality as disparities in economic conditions of different persons or groups. The authors argue that the term "economic conditions" is often represented by income, but there are other possible candidates for the term such as energy consumption, life expectancy, infant mortality, and access to water.

According to Champernowne and Cowell (1998) the disparities in the above mentioned economic indicators are better understood by focusing on the population broken down into various groups rather than the entire population as a collection of individuals. The grouping can be based on factors like ownership of assets, occupation, age, ethnicity, and gender. The intricate involvement of various indicators and groups suggests that the study of economic inequality is quite complicated and multifaceted.

Like the previous authors, Champernowne and Cowell (1998) argue that the analysis of economic inequality mostly focuses on income because income not only affects living standards directly but also other factors that affect living standards such as consumption expenditure.   However, income data poses various problems for inequality analysis.

The authors point out that economic inequality is generally seen as unjust for various reasons. The simple reason discussed by the authors is "the resentful envy aroused by the spectacle of a wealthy few enjoying ease whilst one's own kind have to toil and put up with constant inconvenience and hardship" (Champernowne and Cowell, 1998, p.7). But the wealthy few may also have their own opinion about inequality being unjust. Another

reason discussed by the authors for considering inequality as unjust arises from the dispute involving "inequality of outcomes" – inequality for which the affected people are responsible themselves and "inequality of opportunities" – inequality for which affected people are not responsible. The authors mention that though the latter form of inequality is considered more unjust, debate arises from distinguishing these two types of inequality. The authors argue that economic inequality in society is also an indication of the fact that the richer classes in society are not economizing on their spending, that is, spending progressively more on luxury and non-essential items than are needed for survival.

Champernowne and Cowell (1998) maintain that economic inequality can affect major economic indicators and in turn may get affected by the changes in those indicators. They argue that it is often suggested that there is a direct relationship between economic inequality and economic growth, that is, a high level of inequality is needed for high growth. The authors highlight various arguments behind this assertion – inequality provides the incentive for improvement of one's lot, inequality leads to much needed savings made by the rich class, and attempts to reduce inequality may lead to flight of capital and labour to places with higher remunerations and thereby hamper growth. However, according to the authors, there are arguments that negate the above. Incentives may be in the direction of production of goods and services for the rich class leading to a huge surplus of particular types of goods and services, the role of savings can be replaced by large corporations and the government, and flight of labour may not be that easy to take place.

Coudouel et al. (2002) present a technical discussion of inequality focusing mainly on income. According to the authors, measurement of poverty depends on two things –

average level of income or consumption and distribution of income or consumption. A standard poverty measure attempts to determine the situation of the individuals or families at the bottom of the distribution demarcated by a poverty line. Inequality, on the other hand, is a broader concept in the sense that it takes into account the entire population, not only the section of the population below the poverty line. Most inequality measures are not based on the mean of a distribution, rather on the entire distribution. Inequality can be measured for monetary (as well as non-monetary) distributions by using some commonly used indices such as the Gini coefficient of inequality, the Theil index, the decile dispersion ratio and the share of income and consumption of the poorest x percent. These indices are discussed in chapter 3.

Coudouel et al. (2002) point out some of the many different dimensions of inequality comparison analysis such as: comparison of extent of inequality among certain groups at a certain point in time; comparison of changes in inequality over time and for various groups to see if all the groups experienced similar changes in inequality or not; comparison of the level of inequality in different dimensions, for example, income vs. health outcomes; comparison of inequality of different consumption categories or income source, for example, farm vs. non-farm income. The authors also suggest decomposition of inequality between groups, and within a group. An example of the first decomposition can be inequality between rural and urban areas, whereas an example of the second type of decomposition can be inequality within a rural area.

Coudouel et al. (2002) argue that as poverty is based upon mean income and inequality in income, it is possible to see how economic growth (assumed as growth in mean income) and change in inequality (assumed as change in the distribution of income and hence a

shift in the distribution) can affect poverty. The authors maintain that higher inequality may lead to higher poverty in the following three ways:

- Higher inequality may cause fewer resources going to those who are at the bottom of the income distribution leading to higher poverty.

- Higher initial inequality may generate lower economic growth and in turn higher poverty. For example, inequality in access to credit may lead to poor people getting fewer loans and investing less as a result.

- Higher initial inequality may result in a lower share of benefits of growth going to the poor

Coudouel et al. (2002) opines that welfare is not only based on absolute level of income or consumption but also on how people compare themselves with others. That is why "Inequality has a direct, negative impact on social welfare" (Coudouel et al., 2002, p. 77).

In the end a look at the definition of inequality provided by Salverda, Nolan & Smeeding (2009) would help the reader to understand the broadness and complexity of the term. The authors say "Economic inequalities can be conceived of as inequalities with an economic effect or an economic origin, being as much an outcome of the underlying economic process as an input into these processes" (p. 8).

The authors argue that income, which is at the centre of economic power, is considered the core element in analyzing economic inequality. Accumulated wealth is considered another means of economic power and hence warrants a focus in inequality analysis. Apart from income and wealth, economic inequality can be experienced in many other

aspects of life involving "life-chances, the opportunities, obstacles, and misfortunes that different people face in striving for the sort of life they want to lead" (Salverda et al., 2009, p. 8). Inequality is a concept closely related to institutional structures, property rights, and overall economic performance.

From the above discussion, it transpires that at practical level income inequality is the most commonly used concept to understand distribution of and command over resources. Furthermore, since this research deals with income poverty, it is logical to look at income inequality, the more so since data on off-reserve Aboriginal wealth is not available.

From the next chapter onwards, unless otherwise mentioned, the words poverty and inequality refers to income poverty and income inequality respectively.

Table 2.1: Literature on Poverty Concepts and Definitions Discussed in this Chapter

	Conventional definitions	Non-conventional/ broad definitions	Alternative definitions
Monetary definitions	Sen (1981): biological approach, inequality approach, relative deprivation approach, value judgement approach, and policy definition approach Hagenaars (1991): income, consumption, and welfare approach Ravallion (1993) Blackwood and Lynch (1994): income, consumption and biological approach Kanbur (1999): income, consumption, and inequality approach Coudouel, Hentschel, and Wondon (2002) : income and consumption approach Haughton and Khandker (2009): income and consumption approach	Blackwood and Lynch (1994): Streeten (1979), Sen (1981) - entitlement approach	Sen (1995, 1999): capability approach Osberg (2007): capability deprivation
Non-monetary definitions	Sen (1981): biological approach Haughton and Khandker (2009): poverty in terms of malnutrition	Blackwood and Lynch (1994): Singer (1975) Coudouel, Hentschel, and Wondon (2002): poverty in terms of health, nutrition, literacy, social relations, security, self-esteem and power Haughton and Khandker (2009): poverty in terms of illiteracy	Sen (1995, 1999): capability approach Kanbur (1999) : human development, vulnerability and powerlessness Kanbur (2003): death, behavioural economics, multidimensionality Sen (2000): social exclusion Osberg (2007): capability deprivation, social exclusion, multidimensionality

CHAPTER 3

THE MEASUREMENT OF POVERTY AND INCOME INEQUALITY

The measurement of income poverty involves several steps: determination of a reasonable poverty line and identification of the poor on the basis of the poverty line, choosing an appropriate poverty index or indicator that fulfills the poverty axioms as closely as possible, aggregation of the poor by using the chosen index, and finally interpreting the value of the index. This chapter presents a discussion of the above mentioned steps. It also gives a summary of various types of poverty lines used in the Canadian context. The chapter then goes on to discuss measurements of income inequality and their various attributes. The chapter provides the rationale behind the specific forms of measurement of income poverty and inequality to be used in ensuing chapters.

3.1 Poverty Measurement

3.1.1 Poverty Lines

As discussed in chapter 2, a poverty line provides a threshold to identify the poor. Depending on which concept of poverty is used, the threshold is determined accordingly. For example, in the context of income poverty, the poor are those whose income is below a specified minimum level. This minimum income level is defined as the poverty line. There are various definitions of income to choose from. Some of the definitions are discussed by Hagenaars (1991) and presented in chapter 2 above. Apart from choosing the appropriate definition of income, a researcher also needs to decide whether absolute poverty is of interest or relative poverty.

Hagenaars (1991) points out that in case of absolute poverty, the poverty line serves as a fixed level of resources such as minimum income to sustain life. This level can be based either on general perception about how much is needed for sustenance, or on research determining a minimum level needed to make ends meet. An absolute income poverty line is insensitive to the income distribution of the society. On the other hand, when relative poverty is of main concern, the poverty line is determined based on the income distribution of the society and without any reference to basic needs. An example of a relative income poverty line can be a certain percentage of mean or median income in the society.

Hagenaars (1991) terms both the relative and the absolute poverty lines as objective poverty lines – an amount of income determined a priori, going below which would make a household poor. On the other hand, a poverty line could be subjective based on people's perception about the minimum amount of income needed to meet the basic needs of a representative family or one's own family. This type of poverty line is called the Leyden poverty line, based on the Leyden school discussed earlier.

The absolute poverty line is suitable for conducting comparative analysis of poverty over time and space. The main problem with the absolute poverty line is in determining what constitutes the basic needs for survival and the minimum resources needed to meet the basic needs. On the other hand, though the relative poverty line is free from this problem, dependency on distribution creates another type of problem. For example, if income of the poor declines, holding everything else constant, that leads to decline in mean income and consequently the relative poverty line. This may cause the value of the poverty index to fall. On the other hand, when the income of the non-poor increases, holding everything

else constant, that leads to an increase in mean income and consequent increase in the relative poverty line. The value of the poverty index increases as a result. The absolute poverty lines make sense in low to middle income countries whereas the relative poverty lines are more relevant in high income countries where absolute poverty is noticeably low.

There are various ways of determining the absolute poverty line. Sen (1981) and Hagenaars (1991) shed some light on this. Their discussions can be found in chapter 2 above. Three major methods discussed by Ravallion (2008) and in line with Sen (1981) and Hagenaars (1991), are: cost of basic needs method, food energy method and subjective method. These lines are discussed below.

According to the cost of basic needs method the cost of a representative food basket needed to attain the minimum energy requirement is calculated. In this method, along with the food items, provision is made for cost of non-food items as a percentage of that of the food-items. The costs of food and non-food items are added together and the total cost or expenditure represents the poverty line. This method can be questioned on various grounds – how to determine the minimum energy requirement as it may vary according to age, gender, and time, how to find the representative food basket fulfilling the requirement, what prices to use in cost calculation, and how to make the provision for non-food items. Some solutions have been proposed in this regard. For example, 2,100 calories per day per person is now used as the standard energy requirement. The food basket of a particular population group is taken as the standard and that standard is held fixed for all the other groups under consideration. Possible choices for the prices used are local prices for a specific regional population group or national average prices for all the

items in the basket. There are two ways of taking non-food into consideration. One is to incorporate the non-food items while forming the basket of necessities, and the other is to calculate the share of non-food items in the total cost on the basis of share of food in the total cost.

According to the food energy method, instead of directly calculating the cost of the minimum energy requirement level like the previous method, observations are made to see at what income or expenditure level people are able to attain the basket needed to meet the minimum energy requirements. That income or expenditure level is considered the poverty line. This method takes into account both food and non-food items. Graphically, an income (or expenditure) – calorie intake function is drawn by plotting income (or expenditure) along the horizontal axis and corresponding calorie intake along the vertical axis. The poverty line is determined by finding the income (or expenditure) level at which minimum calorie intake is fulfilled. There are problems with this approach too. For the same energy level, richer groups may spend more than the poorer groups and this may pose a problem in finding the right income and expenditure level. The consequent poverty line will be higher for the richer group and lower for the poorer group. Furthermore, with the passing of time and increase in prices, the poverty line will increase.

The difference between the cost of basic needs method and the food energy method is that in case of the former method the minimum energy requirement and corresponding basket are determined first and then the cost of the basket is calculated. In the latter method, instead of doing the calculation, the cost of the minimum energy requirement is

determined on the basis of observations. These two methods are different more in their approaches than in their contents.

The subjective method is based on people's perception or subjective judgement about basic needs. The Leyden school, discussed in chapter 2, is an example of such a subjective method.

A poverty line can be a mix of absolute and relative poverty lines as well. Such a line takes into account both income distribution and an absolute minimum need for sustenance. Furthermore, the distinction between the absolute and relative poverty line can get a little murky because the definition of basic necessities is often determined by the social norms giving the absolute line some flavour of the relative. A summary of different types of poverty lines are presented in Table 3.1.1.

There are two desirable properties that a good poverty line should be able to fulfill. Asra and Francisco (2001) elaborate these properties. A poverty line needs to be relevant or specific and consistent or comparable. The first attribute implies that a poverty line trying to identify poverty of a certain group in a specific location has to be reflective of the characteristics of that location such as life pattern, cultural and social conditions and norms. This means that the poverty line used in one region should be independent of the poverty line used in another region. The second attribute implies that if poverty needs to be compared across regions, the poverty line has to indicate the same standard of living for all these regions. These requirements may be contradictory.

A consistent poverty line may not be specific if, for example, there are two regions – rich and poor, and definitely a poverty line that is specific to the poor region cannot be

specific to the rich region at the same time. On the other hand, if two poverty lines for the two regions are used, consistency will be sacrificed. Similar problems arise when poverty is analysed across time. When poverty lines are updated to reflect current social standards and be specific, they lose their consistency over time. So there is ~~an inevitable~~ a trade-off between specificity and consistency and the outcome depends on which aspect of poverty is given importance.

The National Council of Welfare (1998-99) provides a nice summary of characteristics of poverty lines. According to the Council, all poverty lines are relative, arbitrary, less than perfect and are a research tool to measure income of groups of people, not individuals.

The current views on poverty are definitely different from views a century ago. Canadian views on poverty are definitely different from views on poverty in other parts of the world. These differing views make the poverty lines relative over time and space. When a poverty line is chosen to be fifty per cent of median income, or thirty per cent of mean income there is no specific rule that governs such a choice. The choice is arbitrary to a large extent. So is the choice of a basket of necessary goods used for drawing an absolute poverty line discussed above. Poverty lines are better able to address most common types of families in most parts of the country, but cannot address every individual's needs. As a result of all these qualifications, poverty lines are always less than perfect. Some poverty lines could be better than others in measuring poverty over time, in terms of choice of income definition, and in terms of comprehensibility, but any single poverty line will always have some shortcomings.

Table 3.1.1: Various Poverty Lines

Poverty line methods	Objective method	Subjective method
Poverty lines		
Absolute poverty line	Cost of basic needs Examples: Rowntree (1901), Orshansky (1965), Citro and Michael (1995).	Leyden school
	Food-energy Examples: Dandekar and Rath (1971), Osmani (1982), Greer and Thorbecke (1986), Paul (1989)	
Relative poverty line	x% of mean income, x% of median income.	

Note: Examples are taken from Ravallion (2008)

3.1.2 Poverty Axioms

The influential work of Sen (1976) on axiomatic derivation of poverty indices has given rise to a vast literature focusing on development of the axioms and construction of theoretically sound indices that fulfill these axioms. These axioms are like preconditions that an index must satisfy to qualify as a good index of poverty measurement. In

connection with constructing his own poverty index, which will be discussed later in this chapter, Sen (1976) introduces the following two major axioms, along with some other supplementary ones, that any acceptable poverty index should satisfy and that some of the commonly known indices do not satisfy:

The monotonicity axiom: Holding everything else constant, a decrease in income of a poor person must raise the value of the poverty index.

The transfer axiom: Holding everything else constant, a pure transfer of income from a poor person to one who is richer must increase the value of the poverty index. According to this axiom, the recipient could be below the poverty line or not, and may or may not cross the poverty line because of the transfer.

Along with the above, Sen (1976) discusses other axioms that are specific to the index he constructs such as the relative equity axiom, the ordinal rank weights axiom, the monotonic welfare axiom, and the normalized poverty value axiom. All these remaining axioms can be summarized as follows - a poorer person's income gap gets greater weight than that of a richer person and the weight is equal to the rank order of the individual in the interpersonal welfare ordering. A person who is better off in terms of welfare is also richer in terms of income.

These fundamental axioms have been refined and some other axioms have been added by authors like Shorrocks (1995) and Chakravarty (1997). Hagenaars (1991), Zheng (1997), Osberg (2007) and Osberg and Xu (2007) give a summary of these axioms. Zheng (1997) presents an exhaustive list of axioms since Sen (1976) and divides these axioms into three categories – core, implied and ad hoc. The core axioms are independent and can be

combined to form other axioms. The most important or best-known of these axioms identified by the above authors and some of these listed as 'core' axioms by Zheng (1997), are discussed below. One point to be noted here is that the authors are not always in agreement regarding which axioms are best-known and which are not. Table 3.1.2 provides a listing of the axioms. .

Axiom 1: The Focus (F) Axiom The poverty index should be independent of changes in income distribution of the non-poor. Zheng (1997) points out that Sen implicitly stated this axiom in 1976 and made it explicit in 1981.

Axiom 2: The Weak Monotonicity (WM) Axiom A decline in income of a poor person, holding other incomes constant, must increase the value of the poverty index. This is the monotonicity axiom given by Sen (1976).

Table 3.1.2: List of Best-known or Core Axioms Classified According to Author

Best-known/ Core Axioms	Hagenaars (1991)	Zheng (1997)	Osberg (2007), Osberg and Xu (2007)
Focus F	Y	Y	Y
Weak monotonicity/ monotonicity (*monotonicity axiom of Sen (1976)*) WM	Y	Implied by SUT	Y
Impartial/ symmetry/ anonymity Im	Y	Y	Y
Weak transfer/ minimal transfer WT	Not mentioned	Implied by SUT	Y
Strong upward transfer/ strong transfer/ regressive transfer/ transfer (*transfer axiom by Sen (1976)*) SUT	Y	Y	Y
Continuity C	Not mentioned	Y	Y
Replication invariance/ population homogeneity RI	Y	Y	Y
Increasing poverty line IPL	Not mentioned	Y	Not mentioned
Weak transfer sensitivity WTS	Y	Y	Not mentioned
Subgroup consistency/ subgroup monotonicity SGC	Y	Y	Not mentioned
Decomposability D	Y	Implied	Not mentioned

Note: Y means the author mentions the axiom, Implied means the axiom is an implication

of one or more core axiom.

The WM axiom does not say clearly what is going to happen to a poverty index when

income of a poor person goes up: the value of the poverty index (such as H discussed

later in this chapter) may not fall if that person does not cross the poverty line, or the

value of the poverty index may fall if the poor person does, indeed, cross the poverty line. To eliminate this confusion Donaldson and Weymark (1986) came up with the strong monotonicity (SM) axiom that says a rise in the income of the poor will cause the value of the poverty index to fall (as cited in Zheng, 1997, p. 131). The SM axiom is going to be true whether the increase in income takes the poor out of poverty or not. The other side of the SM axiom says a fall in income is going to cause the poverty index to rise, which is the WM axiom. The SM axiom implies the WM axiom but the opposite is not always true due to the fact that an increment in income can lead to an individual actually crossing the poverty line.

Sen (1976), Hagenaars (1991), Osberg (2007) and Osberg and Xu (2007) identify the WM axiom as an important axiom, whereas Zheng (1997) identifies the WM and the SM axioms as implied axioms. The above discussion shows that the SM axiom encapsulates the WM axiom. If a poverty index satisfies the SM axiom, it will automatically satisfy the WM axiom. This implies that if some form of the monotonicity axiom is to be kept in Sen's tradition, the strong version of the monotonicity axiom qualifies as a more desirable axiom than the WM axiom.

Axiom 3: The Impartiality (Im) Axiom The poverty index should be independent of the order of incomes. This axiom is also known as the symmetry axiom or anonymity axiom and implies that poverty depends on income distribution of anonymous persons. This means if the same distribution is found for another group of persons, the poverty index will not be affected.

Axiom 4: The Weak Transfer (WT) Axiom A pure transfer of income from a poor person to one who is richer should increase the value of the poverty index if the number of poor people does not change. This axiom is also known as the minimal transfer axiom.

Axiom 5: The Strong Upward Transfer (SUT) Axiom A pure transfer of income from a poor person to one who is richer should increase the value of the poverty index. This is the transfer axiom given by Sen (1976). This axiom is also known as the strong transfer axiom, or regressive transfer axiom. Though Sen originally proposed this in 1976, in 1977 he switched to the WT axiom (Sen, 1979).

The WT axiom says a transfer of income from a poor person to someone richer increases the value of the poverty index provided no one crosses the poverty line due to this transfer. However, the WT axiom does not clearly state what happens to the poverty index if the recipient of the transfer crosses the poverty line. On the other hand, according to the SUT, a transfer of income increases the value of the poverty index irrespective of the state of the recipient. If we hold these axioms to be true, income redistribution among the poor, causing some poor people to become even poorer and some richer poor to remain poor (according to the WT axiom) or to cross the poverty line (according to the SUT axiom), will not have the effect of decreasing the value of the poverty index, rather, the index will increase. This would prevent any possible policy measure that distributes income from those far below the poverty line to those very close to the poverty line from artificially reducing the poverty index.

As Zheng (1997) puts it, the underlying essence of these "transfer axioms is that an equalizing transfer (from a richer person to a poor person) should decrease the poverty

value, while a disequalizing transfer (from a poor person to a richer person) should increase the poverty value." (p. 132). Similar to the monotonicity axiom, if a poverty index satisfies the SUT, it will automatically satisfy the WT axiom. Hagenaars (1991), Zheng (1997), Osberg (2007) and Osberg and Xu (2007) identify the SUT as an important axiom whereas Osberg (2007) and Osberg and Xu (2007) list the WT axiom as another important axiom. Since the SUT axiom subsumes the WT axiom, it would be appropriate to consider the SUT axiom as a more desirable one.

Axiom 6: The Continuity (C) Axiom The value of the poverty index must change continuously with income. This implies that a small change in a poor person's income should not result in a large change in the value of the poverty index.

Axiom 7: The Replication Invariance (RI) Axiom The value of the poverty index does not change if it is based on an income distribution that is a *k*-fold replication of the original income distribution.

Axiom 8: The Increasing Poverty Line (IPL) Axiom The value of the poverty index must increase with an increase in the poverty line. If two identical groups of people have two different poverty lines, the one with the higher poverty line will have a higher value of the poverty index.

Axiom 9: The Weak Transfer Sensitivity (WTS) Axiom A transfer of income from a poor person to someone who is richer should increase the value of the poverty index and this increase should be decreasing in the income of the donor. This means the lower the position of the donor in the income distribution scale, the higher the increase in the value of the poverty index.

Axiom 10: The Subgroup Consistency (SGC) Axiom If poverty of a subgroup of a population increases, the value of the poverty index of the population should increase. If poverty decreases for the subgroup, the value of the poverty index for the population should decrease. This axiom is analogous to the WM axiom and is related to the decomposability axiom discussed below.

Axiom 11: The Decomposability Axiom (D) If poverty indices are calculated for several subgroups of a population, the combined poverty index should be a weighted average of all the indices of the subgroups where the weights are equal to the population share of the groups. A decomposable poverty index is also subgroup consistent but the opposite may not be true.

Some of the above axioms, like the WM, SM, WT and SUT axioms, are straightforward, easy to understand and less controversial, whereas some of them like the F, Im and C axioms, have their problems and are being questioned. Osberg (2007) discusses some of these controversies.

The F axiom states that the changes in the income distribution of the non-poor should be irrelevant to the poverty index. But according to Osberg (2007), this axiom makes drawing of relative poverty lines inconsistent. For example, if there is an increase in the income of the top deciles of the income distribution and no change in the median income, a relative poverty line based on one half of the median income will not change. A poverty index using this poverty line will satisfy the F axiom since the index is not responding to the income change of the top deciles. But as a standard and ethical practice, the poverty line should have increased with the increase in non-poor income leading to an increase in

the value of such poverty indices as the headcount or income gap ratio. The F axiom is more in line with the absolutist approach to poverty. As Osberg (2007) concludes "The "Focus Axiom" is therefore inconsistent with all known methodologies for setting the poverty line – other than an 'absolute' poverty line, or 'market basket' calculation." (p. 14). Zheng (1997) also confirms this conclusion by saying "If one regards poverty as an absolute deprivation of the poor, as suggested by Sen, then the focus axiom is perfectly appropriate. For other definitions of poverty, the focus axiom may be inappropriate." (p. 130)

Osberg (2007) notes that an implication of the Im axiom is that if a poor and a non-poor person trade incomes, the poverty index will not be affected as a result of such a trade. Similarly, if two groups in society, say men (or whites) and women (or blacks), trade incomes to the extent that all poor are now women (or blacks) and all non-poor are now men (or whites), this will not have any bearing on the poverty index. If the relative social position of groups is of importance, looking at a poverty index satisfying the Im axiom is not going to provide any insight about the group-composition of poverty.

According to the C axiom, poverty is not a discrete condition. There may not be much qualitative difference between a person just above the poverty line and one just below. Osberg (2007) argues the opposite and emphasizes that the very identification of poor and non-poor involves discrete qualitative differences. A person just above the poverty line is probably able to pay rent and manage housing no matter how poor he/she may be. On the other hand, a person below the poverty line may be able to manage similar housing but if income drops further below the poverty line that may imply an inability to pay rent and

subsequent eviction and homelessness. The latter stage is of course a discrete qualitative difference.

Though Osberg (2007) questions the F, Im and C axioms, he does not discard these axioms. He, in line with the other authors, lists these as important axioms. These axioms are used as a foundation for theoretically sound poverty indices.

However, for the purpose of this research, the above three controversial axioms are evaluated somewhat differently. In this research the Low income cut-offs or LICOs, discussed later, are used as poverty lines. Because of the relative essence of the LICOs, violation of the F axiom by any of the poverty indices used here is going to be considered a desirable property of the index. On the other hand, as this research looks at poverty of two different population groups (Aboriginal and non-Aboriginal) separately, the implications of the Im axiom are not going to be of any major significance. Furthermore, in case of the C axiom, a poverty index that satisfies the C axiom registers all the small changes in income equally whether the change is below or above the poverty line. This C axiom appears to be a desirable one because it highlights the fact that simply by marginally crossing the poverty line a poor person may not be dramatically out of many aspects of poverty.

3.1.3 Poverty Indices

In the previous two sections various poverty lines and some fundamental axioms for a meaningful and theoretically sound poverty index are discussed. In this section, some of the popular and major poverty indices are discussed. After the discussion, a table (Table 3.1.3) is presented to show if these indices satisfy the axioms listed in Table 3.1.2 above. The indices discussed below are applicable to individuals as well as households. It is

worth noting here that Zheng (1997) presents an exhaustive list of poverty indices along with the axioms they satisfy. All these indices are discussed with regard to income, but they can be applied to take into account deprivation in other aspects of life such as health and education.

The Headcount Ratio (H): This is the most known and widely used poverty index. This index is constructed as the ratio of number of people or households below the poverty line (q) to the total number of people or household (N).

$$H = q/N$$

H gives the incidence of poverty. It is sensitive to number of households or persons, but insensitive to the income shortfall of the poor. H does not change over time as long as no one crosses the poverty line.

The Income Gap Ratio (I): This index is based on the average of the poverty gap ratios of the poor. If the poverty line is z, q is the number of people or households below the poverty line, and the income of a poor individual or household is y_i, then $(z-y_i/z)$ gives the poverty gap ratio, and averaging these poverty gap ratios of the poor population gives the I.

$$I = 1/q \sum (z-y_i/z)$$

This index gives an idea about depth of poverty, but is insensitive to the incidence of poverty. Both H and I are insensitive to the distribution of income among the poor.

The Poverty Gap Index (HI): A combination of the above two indices produces the HI which actually is an average of poverty gap ratios of all the members of the population (N) – poor and non-poor alike.

$$HI = 1/N \sum (z-y_i/z)$$

The non-poor are assumed to have zero income shortfalls. The combination of H and I above does allow taking into account the number of people or households in poverty and how far below the poverty line these people are, but this index does not say anything about the distribution of income among the poor. As long as we can reasonably argue that income is equally distributed among the poor, HI appears to be a reasonable index of poverty. As Zheng (1997) puts it "Although *HI(x; z)* is not distribution-sensitive, empirically it may perform as well as other 'good' poverty measures" (p. 144). HI also measures the minimum amount of resources needed to bring a poor person or household out of poverty.

The World Bank occasionally promotes an index called Squared Poverty Gap (HI2), which is able to address the inequality issue. Squaring of the poverty gap ratios is actually giving emphasis to those households or persons who are further away from the poverty line and thereby allowing measurement of poverty severity as opposed to only depth of poverty.

$$HI2 = 1/N \sum (z-y_i/z)^2$$

The value of the above index will rise if a transfer takes place from the poorer person or household to a richer person or household but the index itself is difficult to interpret. The World Bank advocates use of H, HI and HI2 together in order to undertake poverty analysis of any country.

The Sen Index (S): Since in reality equal distribution of income among the poor is unlikely, Sen (1976) comes forward with his axiomatically derived poverty index that incorporates inequality.

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

where G_p = the Gini coefficient of income inequality among the poor which is discussed further later in this chapter. Sen (1976) has two versions of his index. The above version is more commonly used and appropriate when the size of the poor population q is large.[3]

Sen's path-breaking work on axiomatic derivation of the index gave rise to a class of poverty indices trying to address inequality along with poverty. The S satisfies most of the axioms as can be seen from Table 3.1.3 with some exceptions. Sen (~~1979~~ 1976) explains this index as follows:

> I represents poverty as measured by the proportionate gap between the mean
>
> income of the poor and the poverty line income. It ignores distribution among the
>
> poor, and G provides this information. In addition to the poverty gap of the mean
>
> income of the poor reflected in I, there is the "gap" arising from the unequal
>
> distribution of the mean income, which is reflected by the Gini coefficient G of
>
> that distribution multiplied by the mean income ratio. The income-gap measure
>
> thus augmented to take note of inequality among the poor, i.e., I + (1-I)G, is
>
> normalized per poor person, and does not take note of the number of people below

---

[3] When q is not large: $S = H [1- (1-I) (1-G_p(q/q+1))]$

the poverty line, which could be minute or large. Multiplying [I + (1-I)G] by the head-count ratio H now produces the composite measure P. (p. 227)

Here G = G_p, and P=S.

The Sen-Shorrocks-Thon Index (SST): Sen (1979) quotes various authors such as Anand (1977), Kakwani (1977, 1978), Blackorby and Donaldson (1978), Thon (1978) and Takayama (1979) who come up with the variants of the original S. Shorrocks (1995) modifies the S to make it more applied rather than theoretical, and satisfy a few more axioms. This modification is identical to the limiting case of the index by Thon (1979, 1983) and is called Sen-Shorrocks-Thon Index (SST) (as cited in Osberg, 2007).

$$SST = 1/N^2 \sum (2N-2i+1) \, (z-y_i/z)$$

where N = size of the population (poor and non-poor), i = individual or household, z = poverty line and y_i = individual or household income. The poverty gap ratio is set to zero for the non-poor and the sum is taken over the whole population.

According to Osberg (2000), Osberg and Xu (2000) and Xu and Osberg (2001) the S and the SST can be rewritten in a multiplicative form, decomposing the indices into their components H and I, and a measure of inequality of poverty gap ratios of the poor ($G_{(p)}$) or the whole population (G_x).

$$S_O = HI \, (1+ G_{(p)})$$

$$SST_O = HI \, (1+ G_x)$$

$$\text{and } SST_O = HS_O + 2H(1-H)I$$

The practical importance of the multiplicative form of the S and SST is that it allows identifying the source of change in poverty – change in incidence of poverty, change in depth of poverty and change in inequality in poverty gap ratios of the poor and of the population measured by the Gini coefficients with poverty gap ratios for the non-poor set to zero. Osberg and Xu often term the above indices Poverty Intensity indices.

According to S_O poverty is higher when incidence of poverty (H) is higher, or when the depth of poverty (I) is higher or when the poverty gap ratios of the poor are unequal ($G_{(p)}$ is higher). When $G_{(p)} = 0$, $S_O = HI =$ Poverty gap index. As Osberg and Xu (2007) note, if inequality of poverty gap ratios of the poor is constant or changes a little, the H and I indices are sufficient to explain poverty. The same holds for SST_O.

The main difference between S_O and SST_O is in the Gini coefficients – for the former, the Gini coefficient is for the poverty gap ratios of the poor, and for the latter, the Gini coefficient is for the poverty gap ratios of the total population. Furthermore, as shown by Xu and Osberg (2001), G_x can never be equal to zero and $G_x = 1-H$ when the poverty gap ratios of the poor are identical.

As shown by Osberg (2000), taking natural log difference of the SST_O equation gives the following

$$\Delta \ln (SST_O) = \Delta \ln (H) + \Delta \ln (I) + \Delta \ln (1+G_x)$$

The above equation decomposes SST_O and says that the percentage rate of change in poverty intensity is the sum of the percentage change in H, the percentage change in I and the percentage change in G_x. Thus the above decomposed index allows understanding the

contributing factors to changes in the level of poverty – whether poverty is changing due to changes in headcount, income gap and/or inequality.

The Foster – Greer – Thorbecke Index (FGT): Foster, Greer and Thorbecke (1984) derive a class of decomposable indices as follows:

$$\text{FGT } \alpha \,(y, z) = 1/N \sum (z\text{-}y_i/z)^{\alpha}$$

where α is a measure of poverty aversion. If α = 0, 1, and 2, FGT = H, HI, and HI2. If inequality in poverty gap ratios among the poor and the whole population is zero, FGT $(\alpha=1)$ = HI = S_O = SST_O. This particular index is also called normalized absolute deprivation, or normalized poverty gap. With lower values of α (=0,1) the FGT does not satisfy all the axioms listed in Table 3.1.2 whereas with higher values (>2) it does satisfy all the axioms. The main concern with FGT is in choosing the value of α. The higher the value of α chosen, the higher the weight assigned to the poverty gap ratios of the most disadvantaged. However, Osberg and Xu (2007), quoting from Osberg (2004), argue that the choice of value of α over the range of 2 and 6 for the Luxembourg Income Study did not provide any additional information. This implies that the choice of value of α is empirically less significant.

Table 3.1.3: Poverty Indices and Poverty Axioms

Indices	H	I	HI	S	SST$_O$	FGT
Axioms						
F	Y	Y	Y	Y	Y	Y
WM	N	Y	Y	Y	Y	Y
SM	N	N	Y	Y	Y	Y
Im	Y	Y	Y	Y	Y	Y
WT	N	N	N	Y	Y	Y
SUT	N	N	N	N	Y	Y
C	N	N	Y	N	Y	Y
RI	Y	Y	Y	Y*	Y	Y
IPL	N	N	N	Y	Y	Y
WTS	N	N	N	N	Y	Y**
SGC	Y	Y	Y	N	Y	Y
D	Y	N	Y	N	Y	Y

Note: Y = satisfies the axiom, N = does not satisfy the axiom

* According to Osberg and Xu (2007), one version of the S (the one for large poor population) satisfies RI, whereas the other version does not.

* *Satisfies the axiom for α>2.

Osberg (2007) raises an interesting point in order to relate the SST$_O$ and FGT for α=1. He argues through his research that differences over time in the inequality of poverty gap ratios of the poor are empirically small and do not play a role in affecting SST$_O$ the way differences in H and I do. This implies that SST$_O$ eventually boils down to HI=FGT for α=1. As Osberg (2007) comments

Since explicit consideration of the inequality of poverty gaps very rarely alters the relative poverty rankings of actual social states, one can question whether bringing it into the debate was an advance – given also the likelihood that an emphasis on inequality among the poor diverts attention from the very much larger inequalities between the poor and non-poor. (p. 17)

As Table 3.1.3 above suggests some of the indices do not satisfy many of the core axioms. For example, H does not satisfy the monotonicity and transfer axioms. These axioms are essential in capturing inequality among the poor. On the other hand, H violates the C axiom but such a violation is not desirable as discussed earlier. Furthermore, H satisfies the F axiom but violation of this axiom would have been better. I is similar to H when it comes to satisfying and violating the axioms with exception for the WM and D axioms. HI, on the other hand, satisfies the monotonicity axioms and also the C axiom that is violated by H and I. S, which is offered as an improvement over the previous three indices, fulfills the controversial F axiom but violates another controversial axiom C that is violated by H and I but satisfied by HI. The last two indices of the above table satisfy all the axioms including the controversial F and C axiom.

In the above table, by moving from left to right, it can be observed that in terms of satisfying and violating the axioms, HI, SST_O and FGT stand out in succession as better candidates for poverty indices compared to H, I and S because the former ones fulfill the C axiom, though none violates the F axiom as desired. However, the H and I are simple and easy to understand and cannot be ignored, and S is the breakthrough index that provided the basis for SST_O.

For the purpose of the research three convenient and easy to understand indices H, I and HI are used along with Sen's breakthrough index S and its modification SST_O suggested by Shorrocks (1995) and Thon (1979, 1983) and refined by Xu and Osberg (2001). The FGT is also considered when $\alpha=1$, 2 and FGT = HI, HI2. Though the conventional ones do not satisfy many of the core axioms, in this research these indices are used as they are widely used in poverty literature despite lacking some theoretical soundness. On the other hand, indices like S, SST_O and FGT are considered more theoretically sound but at the same time the soundness is somewhat questioned due to satisfying some of the controversial axioms. Since no single poverty index satisfies all the important axioms and violates the controversial axioms, in line with current poverty literature, this research uses all the six indices discussed above.

3.1.4 Canadian Poverty Lines

There is no officially declared poverty line in Canada. Different organizations and authors use different benchmarks to identify poverty in Canada. This section discusses some of the prominent poverty lines.

Special Senate Committee on Poverty: The Special Senate Committee on Poverty provided a threshold to identify poverty in 1971. Osberg (1981) discusses this poverty line. Budget standards established by the Department of National Health and Welfare were used to identify the items of basic needs. A family of four needed $3,600 to meet the basic needs in 1969. If less than thirty per cent of this income was available for discretionary purposes, poverty set in. So the poverty line was drawn at $5,000 for a family of four. Families with other different sizes were assigned different weights to

derive the corresponding poverty lines. These poverty lines were scaled up for subsequent years by the average percentage increase in Canadian family income. The conceptual basis of deriving this poverty line is similar to the cost of basic needs method discussed above.

Low Income Cut-offs: Statistics Canada's Low Income Cut-offs (LICOs) are widely accepted among researchers to measure poverty in Canada. However, Statistics Canada does not recognize these cut-offs as poverty lines. According to Statistics Canada (2009)

> A LICO is an income threshold below which a family will likely devote a larger share of its income on the necessities of food, shelter and clothing than the average family. The approach is essentially to estimate an income threshold at which families are expected to spend 20 percentage points more than the average family on food, shelter and clothing. (p. 7)

A family below the LICO is considered to face 'straitened circumstance'. The LICOs were first calculated in 1961 using data from the Family Expenditure Survey of 1959. In 1959, an average Canadian family spent fifty per cent of its total income on basic necessities. Based on this information Statistics Canada determined the poverty line for a family of a given size at a level of income at which the family spent seventy per cent or more of the income on basic necessities. Initially there were five different LICOs for five different family sizes. The LICOs were later revised in 1969 by considering differences in cost of living due to variations in community sizes along with family sizes, and considering the fact that forty two percent, not fifty per cent, of total family income was spent on basic necessities. These revised LICOs represented the average family income at

which a family of a given size in a community of a given size spent sixty two percent or more of its income on basic necessities. The additional twenty per cent over and above the percentage of expenditure on necessities is arbitrarily determined by Statistics Canada. The LICOs have been further revised, or 'rebased' according to the terminology of Statistics Canada, following the Family Expenditure Surveys of 1978, 1986 and 1992 to reflect the changing percentage of family income spent on necessities. These years are known as base years. The cut-offs are available from 1976 onwards.

Currently, the LICOs are given for seven different family sizes and five community sizes with 1992 as the base year. Apart from revising the LICOs for the base years (1969, 1978, 1986 and 1992), the cut-offs for other years are obtained by using the corresponding consumer price index. However, the changes in average spending on necessities are not taken into account for those years. There has been no rebasing of the LICOs since 1992. The current LICOs are based on 54.7 per cent and 63.6 per cent of before and after tax income of economic families and unattached individuals.

In order to calculate the LICOs, a model is used where the logarithm of expenditures on food, shelter and clothing is dependent on the logarithm of income, family size and community size. As the first step, the average proportion of income spent on necessities by all families (irrespective of size) is determined by using the Family Expenditure Survey data. An additional twenty percentage points are added to this percentage. Suppose this line is called the x%+20% line. Then, for a given family size and community size, a regression line is fitted through the distribution of income and per cent of income spent on necessities. The intersection between the regression line and the x%+20% line gives the LICO. The same exercise is repeated for seven different family

sizes and five community sizes. All the thirty five LICOs thus obtained are shown in a matrix in the appendix to this dissertation (Table 1). The current x% is equal to 43.6 per cent of after-tax income. So the after-tax LICOs are drawn at 63.6 per cent. One point to note here is that in estimating LICOs, regional differences in standard and cost of living are not taken into account. Toronto, Montreal, Winnipeg and Vancouver will have the same LICOs for different family sizes as these cities have population over five hundred thousand.

The LICOs are calculated for before or pre and after or post income tax income of economic families and unattached individuals. The LICOs are not applicable to northern territories and reserves. Statistics Canada prefers the after-tax LICOs for several reasons: the before-tax LICOs take into account income after transfers and before income taxes, whereas the after-tax LICOs take into account income after income taxes and transfers. Consequently, the after-tax LICOs are better able to capture the effect of two distributive methods – taxes and transfers - instead of one. After income tax incomes are what people are left with to undertake necessary purchases. So it makes more sense to consider the after-tax LICOs instead of the before-tax ones. Consideration of the after-tax LICOs lowers the number of people below the cut-offs. This happens due to the progressive nature of the tax system that compresses the after-tax income distribution and lowers the LICOs causing the number of people below the LICOs to go down.

However, Canadian Council on Social Development CCSD (2000) cautions against use of the after-tax LICOs by noting that Statistics Canada's definition of after tax income does not capture the effect of payroll taxes, such as EI and CPP premiums, subtracted from employment income. CCSD argues that the impact of such taxes is more on the low

income people than the high income people as these taxes are imposed "as a percentage of wages only up to a threshold level". Basically, such taxes work against the progressive nature of income taxes. Furthermore, the after-tax definition also does not account for sales and consumption taxes. According to CCSD, the burden of such taxes is more on the poorer sections of the society. CCSD further contends that expenses for child care and travel to work eat up a higher proportion of income of the low income groups compared to high income groups. On these grounds, CCSD questions the use of after-tax LICOs as these captures only the progressive side of the taxation system and "understates" the true picture of low income.

The LICOs are spatially specific but not consistent as these are broken down along the line of community size and family size. On the other hand, the LICOs are ~~It is not~~ consistent across time as these are updated by using the price index. But any change in living standard is not taken into account by revising the contents of the basket while updating the LICOs on the basis of prices only. That way the LICOs are consistent across time but not specific.

The LICOs have elements of absolute and relative poverty built into them. They are absolute because they are based on a fixed standard, that is, expenditure on basic necessities. They are relative because the lines are rebased to reflect changes in living standards over time. However, the rebasing has not taken place since 1992. This makes the LICOs somewhat absolute, but the updating of the LICOs using the price index makes them relative to some extent. The derivation method of LICO is similar to the food energy method discussed above.

The Canadian Council on Social Development (CCSD) Low Income Lines: The CCSD considers an exclusively relative poverty line developed in 1973. The poverty line, for a family of three, is fifty percent of average income of all Canadian families. Poverty lines for other family sizes are determined in a fashion similar to the Special Senate Committee poverty lines. CCSD lines do not take into account variations in income due to regional variations.

Low Income Measures (LIMs): Another threshold developed by Statistics Canada in 1989 is called the LIMs. A LIM is a fixed percentage of median adjusted economic family annual income. Adjustments of family size are made on the basis of the fact that larger families have bigger needs and the age composition of the members of the family also has an impact on family needs. The LIMs are calculated by using the Survey of Labour and Income Dynamics (SLID) on an annual basis. So updating by using the price index is not necessary as it is in case of the LICOs.

In order to determine the adjusted size of the family, the oldest person in the family is counted as 1, the second oldest person is counted as 0.4, all the other members sixteen years old and above are counted as 0.4 each, and children under 16 years are counted as 0.3 each. The adjusted family income is determined by dividing the family income by the adjusted family size. Then the median of the adjusted family income distribution is determined. The LIM for a one person family with no child is fifty percent of the median adjusted income and the LIMs for other family sizes are obtained by multiplying the one person LIM by the adjusted family size. The LIMs are calculated for both before and after tax family income.

One point to note here is that the idea of an equivalence scale is applied above in order to adjust for family size. This adjustment is based on the assumption that economies of scale take place in consumption of larger families making the cost of living of each person of the family smaller. The equivalence scale assigns decreasing factors to each additional member of the family in the way described above. The adjusted family income or equivalent income is obtained by dividing the family income by the adjusted family size. There are many different equivalence scales in use apart from the one used in case of the LIMs by Statistics Canada, such as the Organization for Economic Cooperation and Development (OECD) scale[4], and the Luxembourg Income Study (LIS) scale.[5]

 In case of the LICOs equivalent income is not considered, whereas in case of the LIMs equivalent income is considered. In case of the LICOs actual family size and community size are taken into account, whereas in case of the LIMs community size is not taken into account. The LICOs are based on a mix of relative and absolute poverty concepts, whereas the LIMs are purely based on a relative poverty concept. The LIMs are less sensitive to business cycle fluctuations than the LICOs as the rebased LICOs do reflect changes in expenditure patterns following such fluctuations.

Market Basket Measure (MBM): Apart from the poverty lines discussed above, a particular kind of poverty line has been developed by the Human Resources and Skills Development Canada known as the MBM. It was developed between 1997 and 1999 and the first set of numbers was released for the year 2000. Between 2009 and 2010, a

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[4] The oldest person in the family is counted as 1, all the other members fifteen years and above are counted as 0.5 each, and all the other members less than fifteen years are counted as 0.3 each.

[5] The square root of the family size is considered.

thorough review was undertaken and the MBM was rebased on 2008 as the base year. All the numbers since 2000 have also been revised.

The method of deriving the MBM is similar to the cost of basic needs method discussed above. The MBM is based on the cost of a specific basket of goods and services needed for a modest standard of living for a family of two adults and two children. The basket includes food, shelter, clothing and footwear, transportation (public transit service and used car), and other necessary expenses (school supplies, personal care products, telephone). The family is adjusted according to the equivalence scale used in case of the LIMs. The MBM takes into account the fact that the cost of the basket varies with geographic location. The MBM is compared with disposable family income to determine if a family suffers from low income.

Many other organizations and researchers have developed their own type of MBMs, for example, the Montreal Diet Dispensary, the Social Planning Councils of Toronto and Winnipeg, the Social Planning and Research Council of British Columbia, the National Council of Welfare and the Fraser Institute, by changing the contents of the market baskets.

The LICOs are based on average consumption expenditure and the LIMs are based on median income. The MBM, on the other hand, is based on cost of a specific basket of necessities and identifies the number of families short of the disposable income needed to buy that basket in a given community.

It is difficult to say if one threshold is better than the other. Depending on the focus of the research any one can be picked up and, if possible, can be complemented by the other

two. In this research the LICOs with base year 1992 are used as they are widely used by researchers and social policy groups. The LICOs, as discussed above, reflect both relative and absolute poverty and take into account variations in expenditures due to family size and community size.

3.2 Income Inequality Measurement

As discussed in chapter 2, analysis of income inequality, requires defining the variable of interest and the distribution of the variable, the unit of measurement and a measure that helps in quantifying the inequality. This section discusses some of the measures of inequality.

3.2.1 Inequality Axioms

For any inequality measure, there are a few desirable properties that it should possess. These properties are like the poverty axioms discussed above. According to Jenkins (1991) and Litchfield (1999) these properties are:

The Symmetry or Anonymity (Sy) Axiom: The inequality measure depends only on the incomes of a distribution, not the people to whom these incomes belong.

The Income Scale Independence (ISI) Axiom: Proportionate changes in all the incomes do not affect the inequality measure. An 'x'-fold increase in all the incomes of all the units of measurement will not cause a change in the value of the inequality measure.

The Population Homogeneity (PH) Axiom: The inequality measure is invariant to replications of the distribution. If a distribution is obtained by aggregating q identical distributions, the value of the inequality measure will not change.

The Transfer (Tr) Axiom: A progressive transfer (transfer from rich to poor) reduces inequality of a distribution whereas a regressive transfer (transfer from poor to rich) raises it.

Decomposability (De): Inequality of a population is equal to the sum of inequality of its constituting subgroups. Any change in inequality of a subgroup results in change in overall inequality.

3.2.2. Inequality Measures

Jenkins (1991) discusses various measures of income inequality including the range, variance and coefficient of variation of an income distribution. The range is the difference between the largest and the smallest incomes. One major problem with this measure is that if all incomes increase by the same proportion, inequality will increase by the same proportion though the income distribution maintains the same shape. Range is not income scale independent. This problem can be resolved by deflating each income by the mean income. However, the range is not going to change whether within that range all the incomes, excluding the two extreme ones, are equally distributed or not. This implies that the range is insensitive to the Tr axiom.

The second measure is variance (V) or standard deviation (square root of variance, S) expressed as

$$V = 1/N \sum (y_i - \mu)^2$$

$$S = \sqrt{V}$$

Where N = size of the distribution, y_i = individual or household income and μ = mean income. Dividing the standard deviation by μ gives the coefficient of variation (CV) that can also be considered a measure of inequality. Out of these three measures V, S and CV, CV is the best one as it is income scale independent, and sensitive to transfer. For example, a transfer of income from a richer person to a poorer one reduces inequality measured by CV. However, CV is more sensitive to transfers taking place at the upper end of the distribution.

Osberg (1981), Jenkins (1991), Litchfield (1999) and Coudouel et al. (2002) discuss some major measures of inequality. These measures are discussed below.

The Gini Coefficient (G): Gini coefficient is the most commonly used measure of inequality and can be used for measuring inequality in many different kinds of distribution including income. The value of the coefficient varies from 0 to 1. A bigger G means higher inequality. A value of 0 implies no inequality, that is, income is equally distributed among the population. On the other hand, a value of 1 implies perfect inequality, that is, one person has all the income.

Graphically, G can be derived from the Lorenz Curve (LC). For calculating G, total population is generally divided into quintiles (from the poorest to the richest), the average income share of each quintile is determined, and the cumulative income shares are plotted against respective quintiles of population to find the LC. The ratio of the area between the 45 degree line (line of equality) and the LC to the entire area below the 45 degree line gives the G. Instead of quintiles, any other cumulative percentage share can be considered.

G does not satisfy the De axiom. G is not additive over different groups if they overlap. It means that G for a country cannot be found by summing the Gs for various geographic or income groups of the country. G satisfies the ISI and PH axioms, that is, an equi-proportionate change in all incomes or a change in the size of the population leaves G unaffected. G changes with any change within the distribution. For example, if a transfer of income takes place from a poor to a rich person or vice versa, G will go up or down satisfying the Tr axiom. However, G is especially sensitive to changes taking place in the middle ranges of the income distribution.

According to Sen (1973) the expression for G is as follows

$$G = 1 + 1/N - (2/(N^2 \mu)) \sum y_i . r(i)$$

Where N = size of the distribution, μ = mean income, y_i = individual or household income arranged in descending order, and r (i) = rank of individual or household income. G =.4 means if the per capita average income is \$1,000, the expected difference in per capita average income of two randomly chosen households will be forty per cent of \$1,000, that is, \$400.

The Theil Index (T): The Theil index has the property of being decomposable, income scale independent, and sensitive to transfers. However, it is difficult to represent and interpret T.

$$T = (1/(N \mu)) \sum y_i \log (y_i / \mu)$$

Where N = size of the population, μ = mean income, and y_i = individual or household income.

T belongs to a general class of inequality indices known as the Generalised Entropy (GE) class, expressed as follows:

$$GE\ (\alpha) = (1/(\alpha^2 - \alpha))(1/N\textstyle\sum(y_i/\mu)^\alpha - 1)$$

Where N = size of the population, μ = mean income, and y_i = individual or household income. According to Cowell (1995), as discussed by Litchfield (1999), any inequality measure that fulfills all the five axioms stated above belongs to this GE class of inequality measures. The value of the GE class of measures ranges from 0 to ∞. 0 means no inequality and inequality increases with increase in the value of the measure. The parameter α indicates the weight assigned to differences between incomes at different points of the income distribution. Lower value of α gives more weight to income differences at the lower end of the distribution, whereas higher value gives more weight at the upper end. When $\alpha = 1$, it implies equal weight throughout the income distribution and GE (1) = T. When $\alpha=2$, GE (2) = CV.

The Decile Dispersion Ratio (D): This index is the ratio of average consumption or income of the top ten per cent of the population to the average income or consumption of the bottom ten per cent of the population. The ratio can be expressed in quintiles and percentiles as well. The ratio simply expresses the income of the richest class of the society as a multiple of that of the poorest class. Though easy to interpret, D is influenced by the extreme values, especially when the sample is small.

The Share of Income or Consumption of the Poorest x Per Cent (X): It is a direct measure of the percentage of total income or consumption of the total population going to the poorest group of the society. It is not sensitive to transfers within the distribution. If

transfers take place in the upper and middle ranges of the distribution and stay within those ranges, there will be no change in X.

Atkinson's Measure (A): Atkinson's measure uses a parameter 'e' to indicate inequality aversion. A higher value of e indicates society's concern with the lower end of the distribution, whereas a lower value of e indicates concern with the upper end.

$$A = 1 - [\sum(y_i/\,\mu)^{\,1\text{-e}}.1/N]^{\,1/1\text{-e}}$$

Where N = size of the population, μ = mean income, and y_i = individual or household income. The value of e ranges from 0 to ∞ and the value of A ranges from 0 to 1 where 0 means no inequality. When α =1-e < 0, A = GE.

The choice of an inequality measure depends on the type of inequality one is interested in. So there is an element of value judgement involved in measuring inequality. For example, CV is responsive to changes in the higher end of the income distribution, G is sensitive to changes in the middle of the distribution and A is responsive to changes in the high and the low end of the distribution. Furthermore, T can decompose aggregate inequality into its components, whereas CV and G cannot. CV, G and T are sensitive to transfers within the distribution. Depending on the focus of the research, any one measure can be used.

In this research, G is selected as it is widely used for inequality measurement. Furthermore, G satisfies all the axioms except the De axiom. Some of the poverty indices used here also incorporate G.

CHAPTER 4

COMPARATIVE PICTURE OF ABORIGINAL AND NON-ABORIGINAL POVERTY AND INCOME INEQUALITY IN CANADA

This chapter reviews the existing literature on Aboriginal poverty and inequality in Canada that has been published since the 1990s. The review focuses on a few major areas – the poverty and inequality status of the Aboriginal population, the indices used in measuring poverty and inequality, and comparison between Aboriginal and non-Aboriginal poverty and inequality. However, some studies focusing on Canadian poverty and inequality in general are also considered in order to get an overall picture. Furthermore, some studies that do not directly address or measure poverty and inequality but discuss income and employment status to provide an economic profile are considered as well to get a broad view of the state of the Aboriginal and the non-Aboriginal population.

The review of the studies in this chapter is presented in tabular forms in the end of the chapter highlighting key information organized in a chronological manner to capture the trends in various indices. Table 4.2.1 provides the reader a bird's eye view of the studies discussed here. This table provides a quick and convenient way of comparing various aspects of the studies such as methodology, unit of analysis, variables and results and helps in navigating from one study to the next. Table 4.2.2 presents some of the specific important results related to measurement of poverty and inequality discussed in the studies. The results related to poverty (Headcount Ratio H giving incidence of poverty) and inequality (Gini Coefficient G_w) are arranged in a chronological manner in this table

to encapsulate the changes in poverty and inequality over time. This table is specifically helpful in comparing the numbers related to H and G_w found in the studies. G_w refers to the Gini coefficient of a particular population group not divided into poor and non-poor.

The chapter concludes with a summary of major findings from the literature. This conclusion is important in understanding the overall trends in poverty and inequality among the Aboriginal and the non-Aboriginal population, and situating and comparing the present research with the existing literature. However, in order to set the backdrop, a demographic profile of the Aboriginal population of Canada is presented first. Unless otherwise mentioned, low income and poverty are considered synonymous and the terms are often used interchangeably to mean income poverty. Inequality refers to income inequality.

4.1 Aboriginal Demographic Profile

Statistics Canada uses three major sources of data for gathering information on the Aboriginal population in Canada – the census, the Aboriginal Peoples Survey (APS) and the Aboriginal Children's Survey (ACS). Some other sources like the Labour Force Survey (LFS) and the Canadian Community Health Survey (CCHS) are also used. Aboriginal peoples are identified considering four different aspects – ethnic origin, Aboriginal identity, registered or treaty Indian and Indian Band or First Nation member. Each aspect gives a different count for the Aboriginal population. The APS is a post-census survey that has been conducted three times so far – in 1991, 2001 and 2006. The survey has two components – an adult component that surveys the Aboriginal population 15 years and older, and a children component that surveys Aboriginal children under 15

years. The ACS was introduced in 2006 and it surveys Aboriginal children younger than 6 years. Since the Survey of Labour and Income Dynamics (SLID), described in chapter 5, does not include the on-reserve Aboriginal population, it provides fragmented information on the Aboriginal population. However, at the same time, this dataset provides detailed annual (before and after-tax) income information about the off-reserve Aboriginal population that is not available in the other datasets mentioned above. The current research utilizes the SLID datasets for this unique reason.

Statistics Canada's latest report on the Aboriginal population titled *Aboriginal Peoples in Canada 2006*, published in 2008, gives a detailed and most up to date account of the Aboriginal identity population (North American Indian or First Nations people, Métis and Inuit) in Canada. According to that report 1,172,790 people claimed Aboriginal identity in the Census of 2006. This is almost four per cent of the total Canadian population. 60 per cent of the Aboriginal population belonged to the First Nations, whereas 33 per cent belonged to the Métis and four per cent belonged to the Inuit. "The remaining three percent either identified with more than one Aboriginal group, or were registered Indians or members of an Indian band or First Nation who did not identify as Aboriginal" (Statistics Canada, 2008, p. 9). 85 per cent of the population of Nunavut was Aboriginal in 2006, followed by the Northwest Territories (50 per cent), Yukon Territory (25 per cent), Saskatchewan (15 per cent) and Manitoba (15 per cent). In the other provinces the percentage ranged from one to six.

According to the report between 1996 and 2006, the Aboriginal population increased by 45 per cent whereas the non-Aboriginal population grew by a modest eight per cent. The growth rate was the largest (91 per cent) for the Métis population followed by the First

Nations people (29 per cent) and the Inuit (26 per cent). Statistics Canada (2008) identified several possible factors behind this growth in the Aboriginal population – high fertility rate, more respondents reporting their Aboriginal identity and a reduction in the number of incompletely enumerated Indian reserves since 1996.

The report finds that the Aboriginal population is increasingly becoming urban. In 1996, 50 per cent of the Aboriginal population lived in urban areas. In 2006 this number rose to 54 per cent. Winnipeg had the largest urban population (68,380), followed by Edmonton (52,100) and Vancouver (40,310). The report suggests that the Aboriginal population is younger than the non-Aboriginal population. 48 per cent of the Aboriginal population was children and youth aged 24 and under. For the non-Aboriginal population the percentage was 31 in 2006.

The report identifies the geographic areas inhabited by the Aboriginal population. 83 per cent of the First Nations people lived in Ontario and the western provinces in 2006 – 23 per cent in Ontario, 19 per cent in British Columbia, 14 per cent in Manitoba, 14 per cent in Alberta and 13 per cent in Saskatchewan. In 1996, 58 per cent of the First Nations people lived off-reserve. The number rose to 60 per cent in 2006. The remaining 40 per cent lived on-reserve. 76 per cent of the off-reserve First Nations people lived in urban areas in 2006. In 2006, 87 per cent of the Métis people lived in the western provinces and Ontario, and 69 per cent of the total Métis population lived in the urban areas. Winnipeg had the largest Métis population in 2006. Six per cent of the total population of the city was Métis. In 2006, 78 percent of the Inuit population lived in one of the four regions within 'Inuit Nunaat' – an Inuktitut expression meaning Inuit Homeland. The Inuit

Nunaat is comprised of the Inuvialuit region in the Northwest Territories, the territory of Nunavut, Nunavik in northern Quebec, and Nunatsiavut in northern Labrador.

4.2 Aboriginal and Non-Aboriginal Poverty and Income Inequality Compared

There is no dearth of research on poverty in Canada in general, but the poverty literature on the Aboriginal population in Canada is scarce. When it comes to studying Aboriginal poverty and inequality in a standard theoretical framework seen in other poverty literature, the scarcity is striking. Aboriginal poverty research is mostly comprised of random snapshots taken at various points in time. In many cases poverty is not recognized adequately or is considered synonymous with low income and disadvantaged socioeconomic conditions. The term poverty is used quite casually without subjecting it to any theoretical rigour. The concepts of poverty, poverty line, and poverty index rarely appear in the discussions. Equally rare is a time-bound study of the pattern of poverty of the Aboriginal population. Aboriginal inequality is a topic that is discussed even less.

In this section, the studies are discussed in three sub-sections. In the first sub-section economic profiles of the Aboriginal and the non-Aboriginal population are discussed with reference to the studies. These studies do not directly address or measure poverty and inequality. In three of the studies in the first sub-section, there are some discussions about poverty and inequality measurement and these are presented in the relevant subsections later. The second subsection looks at studies focusing on poverty of these two population groups, and the third sub-section looks at studies on inequality. The studies in the second and the third sub-sections occasionally talk about economic profile as well. These discussions on economic profile are kept with the corresponding studies. There are some

studies that deal with both poverty and inequality. In such cases, the poverty part of the discussion is presented in the second sub-section and the inequality part of the discussion is presented in the third sub-section.

4.2.1 Economic Profile

Jankowski and Moazzami (1994) conduct a study on the Aboriginal population of North-western Ontario to estimate the annual average total income of that population group. The study also estimates inequality by using the G_w, and also investigates if income is related to educational attainment and employment. The study was conducted in 1993 on 784 Aboriginal people and the findings were compared with data obtained from Statistics Canada for the year 1991. The study finds that the estimated annual average total income of the Aboriginal population 15 years and older in North-western Ontario ($13,749) was significantly lower than the annual average total income for all people at the provincial ($25,967) and national ($24,038) levels.

The study also finds a very high unemployment rate of 41 per cent among the Aboriginal population in North-western Ontario compared to the provincial rate of 10 per cent and national rate of 11 per cent. This may have caused the low income among the Aboriginal population. In order to see if level of education had anything to do with employability, and hence income, the study looks at the educational attainment of the respondents and finds it to be significantly lower than the provincial and national attainment. Education also had a positive correlation with employability and income. The study finds that those with less than grade 5 education had no full time employment. 63 per cent of those who had full time employment had education above grade 11, and the annual average income

of those with full time employment ($27,286) was significantly higher than the annual average income of the Aboriginal population of North-western Ontario. Thus the authors conclude that

> The analysis of this paper provided support for the hypothesis that the lower income among the Native population is directly related to their level of employment and educational attainment. Therefore, a higher level of training and education may offer a solution to the high incidence of low income among the Native population of North-western Ontario. (p. 58)

This study does not make any comments on poverty as such, nor does it try to measure poverty. The hidden assumption here probably is that low income is equivalent to poverty. Furthermore, the study is focused on a small group of people in a specific geographic region and may not be reflective of the entire Aboriginal population. The finding of the study on inequality is given in the sub-section 4.2.3.

Barsh (1994) does specifically mention Aboriginal poverty. He draws a broad picture of the Canadian Aboriginal population in the 1980s and early 1990s by looking at factors such as income, occupation, resource endowment, health, language, schooling, drug abuse, violence and crime rates. In the discussion here, the focus is mainly on the discussion on low income or poverty.

Barsh (1994) argues that since the 1960s the Canadian Aboriginal population has made some improvement in areas such as school enrolment, housing, infrastructure, access to medical facilities and income, mainly through fiscal interventions. By referring to a 1989 report by Indian and Northern Affairs Canada, the author indicates that between 1965 and

1985, average family income of the Aboriginal population increased to 76 per cent of the Canadian average family income.[6] There was an increase in the proportion of the Aboriginal population in employment in the 1980s but the impact on incomes was somewhat subdued by lower average earnings. In 1985, on-reserve Aboriginal families were much poorer than other Aboriginal and Canadian people, making an average income of only 54 per cent of the average Canadian family income. In the same year, the median income of off-reserve Aboriginal males was less than half the median income of Canadian males, and for the off-reserve Aboriginal women the proportion was two thirds.

Though there was an increase in the proportion of the Aboriginal people employed, Barsh (1994) argues that the Aboriginal unemployment rate was quite high, almost double the national rate for the year 1985 whereas the labour force participation rates were very close (60 as opposed to 66 per cent) . In that year, only one third of the Aboriginal people who were employed were able to find a full time job.

In the 1980s the proportion of Aboriginal population earning employment income increased, but Barsh (1994) points out that at the same time the proportion receiving transfer payments from the government increased as well. According to the author, 22 per cent of all Canadians received some form of low income assistance in their lifetime, whereas the percentage stood at 90 for the Aboriginal population and in 1991, 46 per cent of the on-reserve Aboriginal population were dependent on transfer payments to meet their basic needs. The economic development of the Aboriginal population relied heavily on assistance relative to investment and production in the 1980s.

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[6] The percentage for the period 1965-85 seems a little higher compared to what Lee (2000) reports later (82 per cent) for the period 1990 -95.

Though Barsh (1994) mentions poverty, it is not clear how poverty is identified and measured other than the references made about low income, high unemployment and dependence on transfers. However, it is interesting to see that some of the conclusions drawn by Jankowski and Moazzami (1994) for the Aboriginal population of North-western Ontario regarding income and unemployment resonate with the conclusions drawn by Barsh (1994) for the entire Aboriginal population.

Like Jankowski and Moazzami (1994) and Barsh (1994), Kendall (2001) also does not make any explicit reference to poverty, instead she considers being at a disadvantage as being equivalent to being in poverty. She uses the term poverty casually without elaborating what constitutes poverty. However, the author analyses the disadvantaged social and economic conditions of the Aboriginal population in Canada and reviews the primary causes behind such conditions. She also discusses some of the steps taken towards alleviating the social and economic conditions of the Aboriginal population. The author uses various data sources including 1996 Census data for describing the conditions.

According to Kendall (2001), in comparison to other Canadians, the Aboriginal population has lower life expectancy, higher infant mortality, higher fertility and a higher percentage of the population under the age of fifteen. The author relates the greater proportion of Aboriginal population under fifteen to higher fertility. She also identifies some of the probable causes of higher infant mortality and lower life expectancy. These are lack of access to adequate health services especially in remote areas, and a high rate of substance abuse and suicide. Though between 1986 and 1996 the First Nations communities (Registered Indians living on reserves) showed improvement in the areas of

employment, income, education and housing, the difference between the Aboriginal and non-Aboriginal population is significant.

Kendall (2001) identifies some of the causal factors behind the underdeveloped state of the Canadian Aboriginal population. These are – loss of land sovereignty, cultural genocide, lack of self-determination, lack of education, and job market discrimination. These causes are amplified by age and geographic diversity of various Aboriginal groups. Kendall (2001) opines that the prime cause of Aboriginal poverty is unemployment. Contrary to the common belief of unemployment arising from laziness and welfare dependency, the author shows that the labour force participation rate of the Aboriginal population was relatively higher and not significantly different from that of other Canadians. A lower rate of educational attainment could be one possible reason behind joblessness, but there are factors such as "lack of obtainable employment" opportunities and job market discriminations that led to the unemployment scenario. Kendall (2001) cites work of Mendelson and Battle (1992) and Richards (1995) in this regard respectively. Gee and Prus (1998) and Lee (2000) also discuss such job related difficulties.

Drost and Richards (2003) examine income of both the on and off-reserve Aboriginal population and compare that with the income of the non-Aboriginal population for the year 1995 by using census information for the year 1996. Theirs is an examination of income of various population groups only and does not make any suggestions about poverty. This type of comparative discussion on income is quite common in Aboriginal poverty literature and also can be seen from the discussions so far and to follow. However, this study attempts to estimate income inequality by using the G_w and another

coefficient called the Polarization Coefficient. The latter indicates more inequality with higher values. The values range from zero to 100 per cent. This inequality discussion is presented later in sub-section 4.2.3.

The authors argue that median before-tax individual income of the on-reserve Aboriginal population was the lowest ($8,900), as compared to that of the off -reserve Aboriginal population ($ 12,400) and non-Aboriginal population ($19,400). The on and off-reserve Aboriginal median income as a whole was 58 per cent of the non-Aboriginal median income. The question that is not clearly answered is whether these income numbers indicate any shortfall from a benchmark needed for maintaining a standard of living. Such discussions would have been helpful in identifying the Aboriginal people in low income or poverty and the depth of poverty. However, the authors extensively discuss inequality and compare on and off-reserve Aboriginal inequality to non-Aboriginal inequality. This discussion appears in the sub-section 4.2.3 later.

Drost and Richards (2003) connect this income scenario of 1995 with overall educational attainment of the three groups. Two-thirds of the non-Aboriginal population 15 years and older had high school diploma or better. On the other hand, only one half of the off-reserve and one third of the on-reserve Aboriginal population had high school diploma or better. With the rise in education of the Aboriginal population, income also rose and the income gap between the Aboriginal and similarly educated non-Aboriginal groups declined. For the on-reserve Aboriginal people with incomplete high school education, the median income was over one third of that of the non-Aboriginal people with similar education. This income gap declined with an increase in education. The median income of Aboriginal people with a university degree was over four fifths of that of the non-

Aboriginal people with similar education. The positive correlation between education and employment that Jankowski and Moazzami (1994) find for a small Aboriginal community of North-western Ontario is not any different from the finding of Drost and Richards (2004).

The authors further show that the median income gap between the Aboriginal and non-Aboriginal population varied geographically. The Aboriginal median income in Atlantic Canada and Quebec was 70 per cent of the non-Aboriginal median income in 1995. For Ontario and British Columbia, the percentage was 60 and for the Prairie Provinces the percentage was 50. The on-reserve Aboriginal population of the Prairie Provinces suffered most in terms of the income gap. Their income was 60 per cent of the off-reserve Aboriginal population and 40 per cent of the non-Aboriginal population.

The authors also show the pattern of Aboriginal and non-Aboriginal income over a period of ten years. Over the period 1985 to 1995, the on-reserve Aboriginal median income fell from 52 per cent of the non-Aboriginal income to 46 per cent. For the off-reserve Aboriginal population the percentage fell from 73 to 64.

Cooke, Beavon and McHardy (2004) take a different perspective in analysing the state of the Aboriginal population. They look at the overall well being of the Aboriginal population by considering the Registered Indian population and compare the well-being of this group to that of the rest of the Canadian population that includes non-registered First Nations, Inuit, Métis and non-Aboriginal population. The comparison is based on a modified version of the United Nations' Human Development Index (HDI). The HDI is a composite index that incorporates three indices for life expectancy, educational

attainment and income and generates a value that ranges from zero to one. The higher the value of the HDI, the better it is. The modified index looks at educational attainment, annual average income and life expectancy of registered Indians and other Canadians. Necessary data are collected from 1981-2001 Censuses.

The authors observe a decline in the gap between the overall HDI scores of the two population groups with the gains being higher for the Registered Indian group. For the Registered Indian group the HDI increased from 0.62 to 0.76 whereas for the other group the HDI increased to 0.88 from 0.80. However, in terms of all the three sub-indices for education, life expectancy and income, the Registered Indian group was always at a lower level of human development. The difference in real average annual income between these two groups increased during the period. Though the difference in HDI scores between the general Canadian male and female population decreased, the difference in HDI scores between male and female Registered Indians widened. The Registered Indian females were well ahead of the Registered Indian males in terms of educational attainment and life expectancy.

The authors indicate that the difference in HDI scores between the on- and off -reserve Registered Indian population declined but continued to remain in 2001. For the on-reserve Registered Indian males the HDI score went up from 0.55 to 0.70 whereas for the off-reserve Registered Indian males the HDI score rose modestly from 0.75 to 0.80 between 1981 and 2001. In the same time period, the HDI score for the on-reserve Registered Indian females increased significantly from 0.55 to 0.75. For the off-reserve Registered Indian females the HDI score went up from 0.70 to 0.80.

Although the study by Cooke et al. (2004) does not explicitly talk about poverty or inequality, it gives the readers a sense of a broader concept of poverty discussed earlier in chapter 2. This is the concept of human development which looks at poverty as a lack of wellbeing due not only to lack of income but also to other factors such as health and education. However, the major problem with this index is that it cannot say anything about the incidence and depth of poverty and inequality. As can be seen from the study, the index is used to rank various groups in terms of wellbeing.

O'Donnell and Tait (2004) discuss the overall wellbeing of the off-reserve Aboriginal identity population by looking at indicators for health, education, housing and language. Their approach is close to the approach taken by Cooke et al. (2004) but no indicator of overall wellbeing, such as the HDI, is used. The issues of poverty and inequality are not addressed either. On the basis of the information gathered from the APS 2001, Censuses 1996 and 2001 and some other supporting datasets such as Canadian CCHS 2000-01, the authors draw conclusions on overall wellbeing. These conclusions are published in a report in Statistics Canada's spring 2004 issue of *Canadian Social Trends*.

According to the report, 56 per cent of Aboriginal adults reported excellent or very good health as opposed to 65 per cent of the total Canadian adult population in 2001. On the other hand, the gap in self-reported health status between Aboriginal young adults (15-24 years) and total Canadian young adults was smaller. 69 per cent Aboriginal young adults reported excellent or very good health status whereas 71 per cent total Canadian young adults reported the same. However, this gap in health status widened for older age groups. 45 per cent of the adult Aboriginal population reported suffering from one or more

chronic health condition in 2001. Arthritis, high blood pressure and asthma are some of the most common conditions.

The report states that the percentage of off-reserve Aboriginal youth (20-24 years) who left secondary school before completion declined from 52 per cent in 1996 to 48 per cent in 2001. At the post-secondary level, five per cent of the off-reserve young Aboriginal people (25-34 years) completed university education in 1996. This number rose to eight per cent in 2001. However, family responsibilities and financial reasons stood in the way of completing post-secondary education.

According to the report, 22 per cent of the off-reserve Aboriginal people lived in crowded housing in 1996. The number came down to 17 per cent in 2001. For the total Canadian population the number stood at 7 per cent in 2001. Crowding is a problem for the Inuit people in the Canadian Arctic where 53 per cent of the population lived in crowded housing in 2001. Safe water is another problem in this region where 34 per cent of the population experienced contaminated water.

The report concludes that

> Despite their progress, Aboriginal people are more likely to have poorer health, including chronic conditions, lower levels of education and are more apt to live in crowded homes compared to the overall population in Canada. In addition, Inuit in the Far North have concerns about water quality. There is also a declining knowledge of Aboriginal languages, although it remains high for Inuktitut, the language spoken by many Inuit. (p. 23)

Siggner and Costa (2005) explore the demographic and socio-economic features of the Aboriginal population residing in selected CMAs for the period 1981-2001. The time period overlaps with the ones considered by Barsh (1994) and Drost and Richards (2003) and extends by six more years. Their study is a part of a series published by Statistics Canada on trends and conditions in census metropolitan areas.

The study, however, does not deal with the issues of low income or poverty and inequality in the selected CMAs. For their analysis, the authors used a framework known as "Community Wellbeing Circle" that is closely related to the HDI discussed previously and the Aboriginal people's holistic approach to life known as the Medicine Wheel. The framework is founded on four major "pillars" – acquiring knowledge, a decent standard of living, living long and healthy lives, and building better communities. The focus of the study is on the first two pillars. The authors look at those CMAs where the Aboriginal population was at least five per cent of the total CMA population. Some of the CMAs included in the study are Montreal, Ottawa-Hull (Ottawa-Gatineau), Toronto, Sudbury, Thunder Bay, Winnipeg, Regina, Saskatoon, Calgary, Edmonton and Vancouver. These CMAs represent 80 per cent of the total Aboriginal population living in all the CMAs.

In analysing the decent standard of living, Siggner and Costa (2005) find that though the Aboriginal employment rate improved in most of the CMAs for the age group 25-54 years, the gap in employment rate between the Aboriginal and non-Aboriginal population did not change much over the 1981-2001 period. Winnipeg, Edmonton and Sudbury were the exceptions where the gap narrowed by seven to 10 percentage points.

With the improvement in the employment situation, and budget cut-backs in the 1990s, dependence on government transfers declined significantly for these selected CMAs over this twenty year period, and the gap between the Aboriginal and non-Aboriginal population in receiving transfers also narrowed. The percentage of Aboriginal population receiving transfers dropped from 24.1 to 15.8 between 1980 and 2000, whereas for the non-Aboriginal population, the percentage fell from 11.4 to 10.3. However, the proportion of Aboriginal people making a total income of $20,000 or more a year declined, as did the proportion for non-Aboriginal population. For most of the CMAs, the gap between Aboriginal and non-Aboriginal median employment income narrowed

The authors conclude that the Aboriginal population living in the selected CMAs were doing better in 2001 than they were in 1981 in terms of improvement in employment rate and narrowing of employment income gap. However, the authors caution that some of this improvement could be due to those people who did not report themselves as Aboriginals in the earlier censuses but started to report themselves as Aboriginals in the later years. Moreover, the fact that there remains gaps in employment and incomes of the Aboriginal and non-Aboriginal population and that the percentage of the Aboriginal people earning $20,000 and above has declined are indicative of the challenging situation for the Aboriginal population.

In this study the authors do not directly discuss low income or poverty and inequality of the urban Aboriginal population. Moreover, they come to a quick conclusion about Aboriginal people doing well in 2001 despite the fact that employment and income gap between the Aboriginal and the non-Aboriginal group remained, and there has been a decline in the percentage of population earning $20,000 or more a year.

 In the tradition of income comparison, Pendakur and Pendakur (2008) explore income and earning disparity between the Aboriginal and the non-Aboriginal people in Canada. By using data from the 2001 Census, the authors look at disparities in wage earnings and total income of the Aboriginal and the non-Aboriginal population. They looked at three different definitions of Aboriginal population separately – self reported Aboriginal identity (North American Indian, Métis, and Inuit), Aboriginal ancestry (single or multiple ancestries) and Aboriginal registry (treaty or registered Indian) for the purpose of the research, and also looked at earning and income disparity across these groups. Control variables such as age, marital status, number of household-members, knowledge of English and/or French, and area of residence are used.

The authors find that earning and income disparity was severe between these different Aboriginal groups and the non-Aboriginal group in 2001. The situation was the worst for the Registered Indian group, followed by the ancestry and the identity groups. All these groups were doing much worse than the non-Aboriginal group, and doing even worse than the most disadvantaged non-Aboriginal ethnic minority groups. Contrary to the experience of other ethnic minorities, living in cities with a high Aboriginal population concentration did not make things better for the Aboriginal groups. Furthermore, none of the Aboriginal groups showed significant returns to education, as schooling did not reduce the disparity much despite some improvement in income. Government's preferential treatment in hiring Aboriginal people did not make the picture look any brighter.

Pendakur and Pendakur (2008) conclude that with the highest fertility rate and severe income disparity, the Aboriginal population appears to be the poorest ethnic group in

Canadian society. This study, like the ones discussed above, considers poverty as synonymous with low income. However, it does not use any benchmark to identify poverty and aggregate poverty. It also does not use any index to highlight inequality.

In a recent analysis of the state of the Aboriginal population in Canada, Wien (2009) looks at the Census of 1996, 2001 and 2006 to understand the changes in economic status of the Aboriginal identity population in Canada. The findings are discussed in a report titled *The State of the First Nation Economy and the Struggle to Make Poverty History*.

Echoing earlier authors, Wien (2009) affirms improvement in various indicators such as education, employment and income, and a reduction in the gap between Aboriginal and non-Aboriginal population with regard to the indicators between 1996 and 2006.

There has been improvement in educational attainment of the Aboriginal population. The author shows that the percentage of adult population (15 years and older) having less than a high school education reduced for both the Aboriginal and non-Aboriginal groups. For the on-reserve Aboriginal population the percentage declined from 54.8 to 48.4 between 1996 and 2006, whereas for the off-reserve Aboriginal group, the percentage declined from 49 in 1996 to 40.1 in 2006. However, the decline is more noticeable for the non-Aboriginal group with the percentage dropping from 34.3 to 23.1 indicating higher educational attainment for this group.

Along with this increase in percentage with more than a high school education, the percentage of adult population with a university certificate, diploma or degree at the bachelor's level or above increased. For the on-reserve Aboriginal population the percentage nominally increased from 1.8 to 3, for the off-reserve Aboriginal population

the percentage increased from 4.2 to 6.8, and for the non-Aboriginal population the percentage increased from 13.5 to 18.6.

With the improvement in education, the labour force participation rate increased for all the three groups, but most noticeably for the off-reserve Aboriginal population. The author shows that the on-reserve participation rate increased nominally from 51.1 to 52, the off-reserve rate increased from 58.6 to 63.8 and the non-Aboriginal rate increased from 65.6 to 66.9. With the increase in the labour force participation rate, employment rates also improved with the most noticeable improvement again for the off-reserve Aboriginal population. The employment rate increased from 44.4 per cent in 1996 to 54.9 per cent in 2006. The non-Aboriginal employment rate increased rather slowly from 59.2 per cent in 1996 to 62.7 per cent in 2006, whereas the on-reserve Aboriginal employment rate increased from 36.4 per cent to 39 per cent. On the other hand, the unemployment rate declined from 28.8 per cent to 24.9 per cent for the on-reserve Aboriginal population, from 24.2 per cent to 14 per cent for the off-reserve Aboriginal population, and from 9.8 per cent to 6.3 per cent for the non-Aboriginal population. Again, the gain is mostly for the off-reserve Aboriginal group.

The author gives an age-specific breakdown of the unemployment rates to see which group is at a disadvantage. Unemployment is found to be higher among the younger Aboriginal population (15-24 years) compared to other Aboriginal age groups, but the unemployment rate of this age group also declined between 1996 and 2006 from 35.5 per cent to 26.7 per cent. The unemployment rate was highest among the on-reserve young population of 15-24 years and declined from 41.9 per cent to 38 per cent between 1996 and 2006. It was the lowest among the urban-CMA (census metropolitan area) Aboriginal

population of 15-24 years where the rate declined from 32.3 per cent to 20.6 per cent between 1996 and 2006. Self-employment remained high among the off-reserve Aboriginal population compared to the on-reserve counterpart. On-reserve self-employment declined from 5.4 per cent to 3.6 per cent, whereas it remained steady for the off-reserve and non-Aboriginal population at 7 per cent and 12 per cent.

Median income of the adult population improved for all population groups between 1995 and 2005, but Wien (2009) shows that the improvement was more significant for the non-Aboriginal and off-reserve Aboriginal population compared to the on-reserve population. With increase in total income, transfer as a percentage of total income declined. For the on-reserve Aboriginal population the percentage declined from 35.5 in 1996 to 28.6 in 2006. For the urban-CMA Aboriginal group the percentage fell from 25.1 to 18.1 and for the non-Aboriginal population the percentage declined from 13.8 to 10.9. The findings of Wien (2009) on poverty are discussed in the following sub-section.

Similar to Pendakur and Pendakur (2008), Wilson and Macdonald (2010) measure the employment income gap between the Aboriginal and the rest of the Canadian population by using the 1996, 2001 and 2006 census data. Here the employed section of the population earning employment income is considered. The authors find that income inequality in the form of the median employment income gap between these two groups persists at a "disturbing level".

The gaps in the median income for the two groups were $8,135, $9,045, and $9,428 for the years 2006, 2001 and 1996 respectively. In 2006, the income gap between the two population groups declined a little more compared to the previous two periods (1996 and

2001). According to the authors, if the income gap keeps declining at this rate, it would take 63 years for the income gap to be eliminated. The authors further observe that similar income gaps can be detected for Aboriginal and the rest of the Canadian population living on-reserve and off-reserve in rural and urban settings. However, geographic location itself could not explain the income gaps. For example, non-Aboriginal workers in the urban reserves (adjacent to urban centres) earned 34 per cent more than the First Nation workers. In the rural reserves, the non-Aboriginal workers earned a significant 88 per cent more than the First Nation workers in 2006.

Wilson and Macdonald (2010), like Pendakur and Pendakur (2008), indicate that, with one notable exception, the increase in educational attainment of the Aboriginal population was not able to eliminate the income gap over the last ten years (1996-2006). The exception is the group with a university degree. With a bachelor's degree, the income gap declined from $3,382 to $648 between 1996 and 2006. While the number and percentage of Aboriginal people with a degree increased strongly over the period, by 2006 only eight per cent of the Aboriginal population had a bachelor's degree or higher as opposed to 22 per cent for the all Canadian population. For the Aboriginal population groups with less than a bachelor's degree, the income gaps were substantial. The finding related to higher level of education leading to lowering of income deviation between Aboriginal and non-Aboriginal population groups is in line with Jankowski and Moazzami (1994) and Drost and Richards (2003).

Wilson and Macdonald (2010) observe some interesting trends for Aboriginal men and women. Aboriginal women were finishing high school and getting university degrees at a rate higher than Aboriginal men in 2006. Aboriginal women were earning median income

close to the male Aboriginal median income. Such a trend was not observable among the general population. Aboriginal women who obtained at least a bachelor degree earned a median income greater than non-Aboriginal Canadian women with the same qualification.

4.2.2 Poverty

Lee (2000) undertook a systematic research on Aboriginal poverty. In a mammoth report titled *Urban Poverty in Canada: A Statistical Profile* published by CCSD, the author claims that poverty in Canada increased between 1990 and 1995, but the increase was substantial for the metropolitan areas where the poor population grew by 33.8 per cent as opposed to the overall metropolitan population growth rate of 6.9 per cent. Metropolitan areas are geographic regions having a population of at least 100,000. For poverty measurement, the author uses pre-tax income and low income cut-offs (LICOs).

Lee (2000) claims that urban poverty rates showed regional variations with cities of Québec having the highest poverty rates and southern Ontario having the lowest poverty rates in 1995. Poverty rates for the cities of Atlantic Canada, the Prairies, and British Columbia had widely different ranges. Cities that are centrally located in the census metropolitan areas tended to be more poverty-stricken compared to suburban and adjacent areas. Half the population of the metropolitan areas and two thirds of the urban poor lived in the central cities. Between 1980 and 1995 high poverty neighbourhoods increased in number, occupied larger geographic regions and included a higher proportion of families.

Lee (2000) provides a break-down of urban poverty in terms of various population groups in 1995. The poverty rate was the highest (62.4 per cent) for non-permanent residents (comprised of refugee claimants, foreign students and foreign workers) followed by Aboriginal people (55.6 per cent), recent immigrants (55.2 per cent), visible minorities (37.6 per cent), and persons with disabilities (36.1 per cent).

Lee (2000) finds that increases in education levels, employment and occupational skills reduced the probability of living in poverty, but for a certain proportion of the population that was not the case. For certain population groups as mentioned above, poverty rates varied from city to city. The same type of family had different poverty rates in different cities. Some population groups with lower poverty characteristics such as high levels of education, employment and occupational skills, had higher poverty rates compared to the groups with higher poverty characteristics such as low levels of education, employment and occupational skills. The composition of a population in a city had an impact on the poverty rate of that city. Moreover, income and government transfers varied from city to city leading to varying poverty rates.

Lee (2000) notes that the average income of an urban poor family (identified with reference to LICOs) with working-age members was $14,500 which was only one fourth of the average income of all the families with working age members. The differences in income were mainly due to differences in earnings. The average poverty gap for the poor families with working age members was $12,200. The gaps varied from city to city and did not correspond to the poverty rates of the cities. After 1995, budget cuts significantly reduced income security programmes, even as the labour market improved.

As Lee (2000) focuses on constructing a profile of overall urban poverty, he takes more of a comprehensive view and look at urban Aboriginal poverty as a component of poverty. He uses before-tax income and LICOs to determine the H (called 'poverty rate' in his publication) for the urban Aboriginal population and the discussion remains limited to the pattern of incidence of poverty between the years 1990 and 1995. Of the Aboriginal people living in the cities in 1995, 55.6 per cent were below the LICOs compared to 24 per cent of the non-Aboriginal people. Among the various demographic groups, the Aboriginal population had the second highest incidence of poverty. Cities with higher concentration of Aboriginal population had higher Aboriginal poverty rates. Vancouver is the city with the highest Aboriginal poverty rate (66.1 per cent) followed by Saskatoon (64.9 per cent), Regina (62.8 per cent) and Winnipeg (62.7 per cent).

One of the main factors that Lee (2000) identifies as contributing to the high Aboriginal poverty rate is lack of access to suitable jobs and difficulty in keeping the jobs in the main urban centres. Lack of jobs implies low earnings. The earnings of the off-reserve Aboriginal population were 69.7 per cent of the earnings of all workers. In absolute terms the average gap was $ 8,000. For the full time full year off-reserve Aboriginal workers the percentage was 82.2. Age and education levels were the two main obstacles in entering the labour force. The urban Aboriginal population is much younger on average and the education level is also lower than the non-Aboriginal population.

Picot and Myles (2005) discuss incidence of low income or poverty, family income inequality and low income dynamics in Canada and compare the results with some other countries of the world such as the USA, the UK, Germany, the Netherlands, Belgium, Finland and Sweden. Their discussion is a review of studies done by Statistics Canada,

the Luxembourg Income Study, and the Applied Research Branch of Human Resource Development Canada. These studies take more of a quantitative approach in addressing the issue of low income and inequality, estimate various indices of low income and inequality based on after tax/transfer (disposable) adult equivalent adjusted income and try to explain their patterns. Here we focus on some relevant aspects of the review. Low income or poverty is discussed in this sub-section and inequality in the next.

Picot and Myles (2005) observe the low income rates, similar to H discussed earlier, for the above countries. In doing so, 50 per cent of the median income is considered the low income cut-off which is discussed earlier as LIM. Anyone falling below the cut-off is considered to be in low income. In 1997, the overall low income rate was 11.9 in Canada and this rate was lower than those of the USA and UK and higher than those for the rest of Europe. The low income rate for Canada had been 13.9 per cent in the late 1970s and declined to 11.9 per cent in the late 1990s, the decline coming from a dramatic decline in low income rates for seniors due to major improvements in the Canadian pension system initiated in the 1960s. Except for Finland and Sweden, rates in all other countries in the study increased.

The authors observe that over a long period of time (1980-2002), the Canadian after-tax low income rate based on LICOs followed the changing unemployment rate except for the period 1995-97. Their argument is during this period the unemployment rate fell but the low income rate rose mainly due to two factors. On the one hand, along with economic growth came a fall in transfers and on the other hand, earnings of the poorer sections of society did not improve much. After 1997, the low income rate registered a declining trend.

Despite falling earnings, the low income rate and low income gap fell due to rising transfers in the 1980s. In the 1990s, with falling earnings at the lower end of the income distribution and declining transfers, both the low income rate and low income gap rose. From the late 1990s onwards, the low income rate started to decline and fell well below the 1980s' rates, but low income gaps, despite a fall, did not fall to the levels of 1980s.

As can be seen, the issue of Aboriginal poverty is not addressed explicitly in this review. It shows up for the first time in the discussion related to poverty dynamics. The authors discuss some of the most vulnerable groups that are likely to face persistent low income in Canada. For the period 1996-2000, the five groups that were identified are – lone parents, unattached persons aged 45 to 64, recent immigrants in Canada for less than 10 years, persons with work limiting disabilities, and off-reserve Aboriginal people. 17.2 per cent of the self-identified off-reserve Aboriginal population were in some persistent low income in the period 1996-2000. For the year 2000 the low income rate for the group was 17.4 per cent.

A National Council of Welfare (NCW) study in 2007 found that though the median before-tax total income of Canadian families had been gradually rising since the mid 1990s, that of the Aboriginal population was substantially lower than that of the non-Aboriginal population in 2000. Between 1980 and 2000, the gap in median total income between Aboriginal and non-Aboriginal population aged 25-54 years widened.

The study reports the poverty rate for Aboriginal people living in families in 2001 was 31 per cent compared to a 12 per cent poverty rate for the non-Aboriginal population living in families. The poverty rate was quite high for those not living in families – for the

Aboriginal population the rate was 56 per cent, and for the non-Aboriginal population the rate was 38 per cent. These poverty rates are calculated on the basis of the before-tax LICOs of Statistics Canada and those families living below the LICOs are considered poor. Necessary data are collected from the Census of 2001. However, the study does not clearly discuss how the poverty rates are calculated but presumably, the poverty rate NCW talks about here is equivalent to H discussed in chapter 3.

The NCW study cites a study done by Heisz and McLeod (2004). The authors report a low income rate of 41.6 per cent for the Aboriginal people living in twenty seven large census metropolitan areas (CMAs) for the year 2000. This rate was a decline from 52.4 per cent for the year 1995. The same study finds that in six of these CMAs, the Aboriginal population comprised an increasingly larger share of the population in poverty between 1995 and 2000. Furthermore, NCW (2007) refers to the 2004 SLID data that shows Aboriginal poverty rates were two times more than the non-Aboriginal rates. One conclusion that can be drawn from the NCW study is that Aboriginal poverty measured by H was higher than that of the non-Aboriginal population in 2001 and 2004.

Noel and Larocque (2009), in their evaluation of poverty alleviation strategies of the Canadian provinces, give a cursory picture of poverty in Canada. By using the LICOs, the authors provide the low income rates for the provinces as well as for the whole of Canada. According to the 2006 Census, 21.7 per cent Aboriginal people had after-tax income below the after-tax LICOs whereas 11.1 per cent of non-Aboriginal people were below the cut-offs.

Noel and Larocque (2009) further show that the unemployment rate was higher for the Aboriginal population. Educational attainment and living and health conditions were also lower than those of the non-Aboriginal population. The Aboriginal population had lower life expectancy and had higher likelihood of suffering from obesity and chronic illnesses.

According to Wien (2009), the incidence of before-tax low income for persons living in families declined for rural Aboriginal, urban non-CMA Aboriginal, urban CMA Aboriginal and non-Aboriginal populations between 2000 and 2005. The non-Aboriginal incidence dropped from 12.4 per cent to 11.6 per cent, rural Aboriginal incidence dropped from 22.9 per cent to 18.1 per cent, urban non-CMA Aboriginal incidence fell from 40.4 per cent to 33.2 per cent and urban-CMA declined from 42.4 per cent to 38.3 per cent between 2000 and 2005. Incidence of low income was the highest among the 15-24 years age-group of the Aboriginal identity population. In 2000, it was 38.2 per cent and it declined to 34 per cent in 2005. The Aboriginal senior citizen group (65 and older) had the lowest incidence of low income. The incidence dropped from 15.1 per cent in 2000 to 9.8 per cent in 2005.

4.2.3 Inequality

Jankowski and Moazzami (1994) find that the degree of income inequality measured by the G_w was significantly higher for their small sample of North-western Ontario Aboriginal population (0.447) compared to the provincial (0.398) and national (0.400) numbers for the whole population.

Gee and Prus (2000) look at income inequality among various population groups by exploring the effects of 'ethnicity' or 'race' on income distribution in Canada. They try to

analyze whether ethnic or race identity (for example, being Aboriginal) contributes to low income, and high inequality. For this purpose the authors take data from the 1994 SLID, and use a statistical tool called multiple classification analysis (MCA). This tool allows looking at the average deviation of income of a particular ethno-cultural group from the grand or overall average. The deviations are observed before and after introducing some control variables such as age, gender, region and education. The authors also calculate the G_w for income inequality.

The authors find a 'racial divide' in income between 'whites' (British, French and other European origin) and 'non-whites' (Aboriginal and visible minority). In 1994, the Aboriginal people had lower income and higher inequality in Canada compared to the 'whites' group. The G_w for Aboriginal men was found to be 0.42 (before-tax income) and 0.37 (after-tax income) and the corresponding numbers for Aboriginal women were found to be 0.52 and 0.44.

The authors argue that this racial divide could not be fully explained by social-demographic factors such as education. In case of the Aboriginal people, however, low income (median after-tax income) had some connection with low level of education, but that was not the case always for other groups. Half of the Aboriginal people were employed in semiskilled and unskilled jobs which could explain the low income. A major portion of the Aboriginal population was employed in part-time jobs. Half of the Aboriginal population was involved in some sort of job interruption and unemployment/non-participation in the labour force.

The authors find the Aboriginal people to be the most disadvantaged group due to large income deviations and high inequality, but they also show that for Aboriginal men and women the income deviation is more due to a lower level of education, younger age, and fewer full time jobs compared to other population groups. Some of the findings of Gee and Prus (1998) related to low income, high inequality, high unemployment, low level of education, and lack of full time employment are, therefore, similar to the findings of Jankowski and Moazzami (1994) and Barsh (1994) discussed earlier. However, like the previous studies, this study also does not engage in identifying and aggregating poverty by using different poverty indices.

Drost and Richards (2003) find the inequality indices to be similar for on and off-reserve Aboriginal populations in 1995 and the inequality coefficient (polarization coefficient mentioned earlier) was higher for the Aboriginal population (56 per cent) compared to the non-Aboriginal population (48 per cent). However, for the period 1985 to 1995, Aboriginal income became more unequally distributed, and inequality was higher for the on-reserve Aboriginal population compared to the off-reserve counterpart.

The authors show that the G_w for on-reserve Aboriginal people first increased from 0.48 to 0.53 between 1985 and 1990, and then decreased a little to 0.52 in 1995. For the off-reserve Aboriginal population, the coefficient declined from 0.48 to 0.47 and then went up to 0.51. For the non-Aboriginal population the numbers were 0.46, 0.44, and 0.47. As an explanation, the authors argue that the inequality numbers for the off-reserve Aboriginal and non-Aboriginal population followed the pattern of the economy. Between 1985 and 1990, the Canadian economy experienced high growth that might have contributed to lowering of the G_w, whereas between 1990 and 1995 the economy slowed

down causing the G_w to go up. However, for the on-reserve Aboriginal population the economic growth did not have a similar effect.

The authors identified some possible factors that made the reserves less affected by economic fluctuations such as location of the reserves in remote areas having weak ties to the core economic sectors, and welfare assistance shielding the reserves from recession, but these factors cannot explain the increase in inequality. The authors suggest other possible demographic, institutional and structural factors that might lie behind the behaviour of the G_w for the on-reserve Aboriginal population. As examples of possible causes, the authors mention factors such as changes in educational composition of the on-reserve Aboriginal population, and incomplete enumeration of the on-reserve Aboriginal population causing it to be underreported. However, the authors do not elaborate on these factors.

Picot and Myles (2005) observe that the G_w for family income inequality in Canada was 0.29 in 1997 based on after tax/transfer (disposable) adult equivalent adjusted income. This was lower than the G_w for the UK (0.35 in 1999) and the USA (0.37 in 2000) and a little higher than that for the other countries mentioned in the previous sub-section. The authors then look at the historical pattern of the coefficient and find that for Canada, the after-tax G_w did not register any major change starting from the late 1970s till the late 1990s. On the other hand, the G_w for the UK and the USA started off from the same level as the Canadian G_w but increased and went beyond the Canadian G_w in the late 1990s. The European countries retained their lower G_w values throughout. The authors suggest that the stability of Canadian inequality, even in the face of falling earnings of the

younger adults (below the age of 35) could be a result of increased transfers from the government in the 1980s and early 1990s.

To see if the trend in Canadian G_w still holds, the authors look at the census, the SCF and the SLID, and they look at two points 1990 and 2000. They find a six per cent increase in the G_w for before- and after-tax income between 1990 and 2000 by using the survey data, and a five per cent increase for before-tax income using the census data. The increase in the G_w was due mainly to increases in high incomes, stagnating low incomes and falling government transfers. However, this study does not say anything about Aboriginal inequality.

Heisz (2007), like Picot and Myles (2005), analyses both after-tax (and transfer) family income inequality and low income in Canada for the period 1976-2004 by using SCF 1976-1997 and SLID 1993-2004, and compares the results with census and income tax data. The family income is adjusted for family size by assigning each member the square root of family income. This 'adult equivalent adjusted family income per person' is used by Picot and Myles (2004) as well. Inequality indices Decile Dispersion Ratio (D, discussed in chapter 3) and G_w are used. The author also looks at low income measured in terms of share of persons having less than 50 per cent of 1979 median family after-tax income (similar to LIM discussed in chapter 3), and polarization measured by share of persons having 75 to 150 per cent of overall family median after-tax income. The author looks at various other indices for inequality and poverty, but they are not discussed here, and only some of the major findings are presented here.

This detailed analysis looks at the entire Canadian population without making any distinction between the Aboriginal and non-Aboriginal population. However, this analysis is important in understanding the trends in inequality in Canada. A similar set of observations by Osberg (2008) is discussed later.

The major conclusion of Heisz (2007) is that after-tax family income inequality remained moderately stable in the 1980s, and increased during the period 1989-2004 mainly due to an increase in before-tax, pre-transfer, family market income inequality, not due to a reduced redistributive role of the government's tax-transfer system that remained as strong in 2004 as it was in 1989. Market income comes from sources like wages, salaries, self-employment income, private pensions and investment income. Furthermore, the share of persons in the middle-income families became smaller and the gap between high and low income families increased significantly.

A detailed look at the indices supports the conclusion. Considering after-tax family income, the D coefficient went down to 6.58 in 1989 from 7.46 in 1979, and then went up to 8.85 in 2004. The G_w also went down to 0.277 in 1989 from 0.283 in 1979, and then went up to 0.315 in 2004. Table 4.2.2 shows the similarities in the values of the G_w discussed in Picot and Myles (2005) and Heisz (2007). Polarization went down a notch between 1979 and 1989 (from 0.512 to 0.521), and then went up to .473 in 2004 indicating more polarization. The low income rate went down to 0.093 in 1989 from 0.129 in 1979, and then went up to 0.102 in 2004. D and G indicate that after-tax family income became more equally distributed in the 1980s, but from the 1990s onwards, income distribution became more unequal. More polarization indicates that there was a decline in the middle class between 1989 and 2004, but the decline was modest.

Heisz (2007) further shows that between 1979 and 1989, increased income (in 2004 constant dollars) was experienced more by the bottom end of the income distribution than the middle and top end but in 1989-2004 the trend changed with income falling for the low income families and rising for the middle and high income families. Average income fell by eight per cent at the bottom 10 per cent of the income distribution, whereas it rose by eight per cent at the median and 24 per cent at the top 10 per cent of the income distribution. Income loss in the low end and rapid income gain in the high end of the income distribution led to an increase in inequality.

In order to find the possible reasons behind the increase in inequality, Heisz (2007) looks at the redistributive role of government transfers and taxes. In order to do so, he compares the G_w calculated on the basis of before-tax and transfer family (market) income and after-tax and transfer family (market) income. The G_w based on after-tax and transfer family (market) income were found to be lower than the G_w based on before-tax and transfer family (market) income indicating the redistributive role. Furthermore, because of taxes and transfers, inequality went down by 0.026 from1979 to 1989, and by 0.009 from 1989 to 2004. According to the authors, this translates into the fact that while in the 1980s, family market income inequality growth was offset by redistribution, the growth in family market income inequality overwhelmed redistribution measures in the 1990s and movements in the G_w reflect this. The author suggests that one possible reason behind the increase in family market income inequality is the increased earning capabilities of two- earner families with both members being highly educated. Low earning and unemployment of lone-parent families and unattached individuals may also play a role in the other direction.

Like Heisz (2007), Osberg (2008) looks at economic inequality in Canada but for the period 1981-2006. Though he does not look at Aboriginal inequality in particular, his observations are insightful in understanding the recent trends in Canadian economic inequality.

Osberg (2008) observes that economic inequality did not change much between the Second World War and 1981 despite massive economic, social and structural changes in Canadian society. Since 1981, there has been an increase in inequality measured by the G_w of total money income and wealth ownership. Specifically, there has been an increase in inequality in after-tax income between 1995 and 2006, echoing Heisz (2007) and Picot and Myles (2005). According to Osberg (2008), the changes in inequality over the quarter century were mainly due to rapid increases in income at the top end of the income distribution and stagnating income elsewhere in the backdrop of severe recession in the early 1980s and 1990s, cutbacks in social assistance spending, and slow growth in wages and real median household income.

One point to note here is that according to Heisz (2007) the tax-transfer system did not change much to address the rising family market income inequality in the 1990s. It was as strong in 2004 as it was in 1989, but it should have been stronger. Osberg (2008) sees this inability to catch up as a reduced redistribution role of the tax-transfer system.

By looking at the percentage shares (quintile shares) of before-tax money income of families (inequality coefficient X discussed in chapter 3), Osberg (2008) concludes that the share of the top 20 per cent steadily increased over the period 1981-2005, whereas for the remaining 80 per cent, including the bottom 20, the shares declined. The author refers

to a supporting study by Yalnizyan (2007) who found that the increase in the income share of the top 20 per cent actually went to the top 10 per cent. The author refers to studies by Frenette, Green and Milligan (2007), and Murphy, Roberts and Wolfson (2007) who came to the similar conclusion of a significant increase in income share at the top end of the income distribution, as extreme as the top one per cent. Heisz (2007) also discussed similar income gain at the upper end of the income distribution.

Osberg (2008) observes the trend in the G_w of after-tax total money income of families for the period 1980-2005, and finds that the coefficient did not change much in the mid to late 1980s, increased in the early to mid 1990s, and then again became moderately stable from late 1990s onwards at a higher level, hovering around 0.43. However, Osberg (2008) argues that the quintile shares and the G_w do not reflect the changes in income at the extreme ends of the income distributions, and mostly capture the changes in the middle ranges. As a result, these indices would be more likely to underestimate the true income inequality picture.

4.3 Conclusion

From the discussions so far, a few general conclusions can be drawn. However, readers need to be cautious about these conclusions as these studies are using different concepts and measures of income, poverty and poverty lines, and studying different groups of the population at various points in time.

Though there were improvements in Aboriginal income between the 1960s and 1980s, the disparities between Aboriginal and non-Aboriginal income persisted all along. The

Aboriginal income level was behind that of the non-Aboriginal during these decades. Moreover, in the 1980s, improvement in income came mainly from government transfers.

Some factors that contributed to low incomes among Aboriginal people are low levels of education, and unemployment. There were some improvements in employment in the 1980s, but despite the improvement a large section of the Aboriginal population was unemployed. It was not due to non-participation as the labour force participation rate was found to be comparable with that of the non-Aboriginal population. Some possible factors for unemployment were low levels of education and job market discrimination. Moreover, a majority of those who were employed were involved in part-time jobs, and semi-skilled and unskilled jobs.

The trend of improvement in Aboriginal income continued in the 1990s and into the 2000s with improvement in education and employment contributing to income increases. However, the gap between Aboriginal and non-Aboriginal income widened, and inequality increased between the 1980s and 1990s. The improvement in overall Aboriginal living conditions between the 1980s and 1990s was registered by an increasing HDI for the Aboriginal population though the level of HDI was still lower than that of the non-Aboriginal population. Urban poverty in general increased in the 1990s. Half of the urban Aboriginal population was found to be in poverty. The role of transfers declined. Aboriginal poverty declined in the 2000s.

Overall Canadian inequality was stable in the 1970s and the 1980s and government transfers played a role. From the 1990s, inequality started to rise due to a rapid increase in income in the high end of the income distribution, stagnating income elsewhere and

falling transfers. Around the late 1990s, inequality became stable at a higher level. Overall, the Canadian incidence of low income or poverty declined between the 1970s and 2000s. A decline in the low income rate among senior citizens due to improvements in the state pension system played a role. However, the studies drawing these conclusions did not extend to the Aboriginal population.

Furthermore, the studies that focus on Aboriginal poverty and inequality do so in a traditional manner by looking at headcount of poverty (H) alone with reference to a LICO poverty line. Other indices are not looked at, nor any rationale given for choosing H over other indices. Though overall poverty and inequality indices are looked at for a considerable period of time, Aboriginal poverty and inequality are observed in a random manner. Consequently, these studies are not able to identify what contributes to changes in Aboriginal poverty – incidence, depth or inequality.

Table 4.2.1 Summary of Aboriginal and Non-Aboriginal Poverty Literature

Author and year of publication	Year of study	Population groups observed	Major sources of data	Major variables observed	Poverty concept/ coefficient used	State of poverty	Inequality coefficient used	State of inequality
Jankowski and Moazzami 1994	1993	Aboriginal population of North-western Ontario	Survey on 784 Aboriginal people, Census 1991, other Statistics Canada publications	Pre-tax average annual total income of an individual	None	Aboriginal income is significantly lower than provincial and national levels	G	Aboriginal inequality is higher than provincial and national levels
Barsh 1994	Various years since 1960	On and off reserve Aboriginal population and all Canadians	APS 1991 and others	Pre-tax average and median income (of families and individuals) and various other	None	Some improvement in Aboriginal income (which is lower than the all-Canadian income) mainly due to government transfers	None	No comments
Gee and Prus 2000	1994	Off-reserve Aboriginal and non-Aboriginal	SLID 1994	Pre-tax and pre-transfer income, Post-tax and	None	No comments	G MCA	Low income and high inequality for the

		population		post-transfer income of individuals aged 20-54				Aboriginal people
Lee 2000	1995	Metropolitan population and metropolitan Aboriginal identity population	Census 1991 and 1996 and others (LFS, SCF)	Pre-tax total income of economic families and unattached individuals not in economic families and others	Income poverty, H, LICOs	Urban Aboriginal poverty rate (55.6 per cent) is the second highest among different population groups	None	No comments
Kendall 2001	Various years since 1990	On and off reserve Aboriginal population of Canada and total Canadian population (on and off reserve distinction is not made)	Census 1996 and other Statistics Canada publications	(Pre-tax) Per capita Income, employment, housing, education etc.	None "… a level of development more closely resembling that of a third-world country" (Kendall, 2001, p. 44)	Some improvement for the Aboriginal population in employment, income, education and housing between 1986 and 1996 but the difference between Aboriginal and non-	None	No comments

						Aboriginal is enormous		
Drost and Richards 2003	1985-1995	On and off reserve Aboriginal population and non-Aboriginal population	Census 1986, 1991, 1996	Pre-tax total income of an individual	None	On and off-reserve Aboriginal median income as a whole was 58 per cent of the non-Aboriginal median income. Income gap improved with education.	Polarization Coefficient and G	More inequality in Aboriginal income than in non-Aboriginal income
Cooke, Beavon and McHardy 2004	1991-2001	Registered Indians and other Canadians	Census 1981-2001	Life expectancy, educational attainment and pre-tax average annual income of an individual	Human Development Index (HDI)	HDI is lower for the Aboriginal group but increased over time, increase in Aboriginal HDI is more than the increase in non-Aboriginal	None	No comments

						HDI, gap between Aboriginal and non-Aboriginal HDI declined, gains are in education and life expectancy, income gap widened		
O'Donnell and Tait 2004	1996, 2001	Off-reserve Aboriginal identity population and total Canadian population	APS 2001, Census 1996 and 2001	Health, housing, education, and language	None Overall Well-being is looked at.	Some improvements but still at a disadvantage compared to non-Aboriginal population	None	No comments
Picot and Myles 2005	1997, late 1970s to mid 1990s, 1990 and 2000	Canadian and off-reserve Aboriginal population	Census 1991, 2001, SLID & SCF 1990 and 2000 and various others	Pre and post-tax/transfer (adult equivalent adjusted) individual income	Income poverty, H, I and 50% of median income (LIM)	H declined between late 1970s and late 1990s, H and I fell in the 1980s, went up in the 1990s, and H declined from late 1990s onwards but I	G	Inequality remained stable between late 1970s and mid 1990s, increased 6% between 1990 and 2000

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						did not fall that much. 17 % of the off-reserve population were in persistent poverty between 1996-200		
Siggner and Costa 2005	1981-2001	Aboriginal population of the CMAs where the Aboriginal population was 5% of total CMA population in 2001 and non-Aboriginal population	Census 1981, 1996 and 2001, APS 2001	Pre-tax total income from all source, and pre-tax total employment income	Income poverty, H, LICO	Conditions improved but large gaps remain between Aboriginal and non-Aboriginal population. Urban Aboriginal low income rate 42% as opposed to urban non-Aboriginal low income rate of 17 %	None	No comments
Heisz 2007	1976-2004	All Canadian families	SCF 1976-1997, SLID 1993-2004	Post-tax/ transfer adult	Income poverty, H and LIM	Poverty declined in the 1980s and	Income inequality, D, G and	Inequality was stable in the 1980s

			and various other datasets	equivalent adjusted family market income per person		increased in the 1990s	some others	and increased during 1989-2004
NCW 2007	2000, 2004	On and off reserve Aboriginal and non-Aboriginal	Census 2001, SLID 2004	Pre-tax economic family income	Income poverty, H and LICOs	Off reserve Aboriginal poverty is higher than that of non Aboriginal	None	No comments
Pendakur and Pendakur 2008	2000	All Canadians (on and off reserve Aboriginal and non-Aboriginal) between 25 and 65 years	Census 2001	Pre-tax employment earning and total income of an individual worker	None	Growing Income disparity between Aboriginal and non-Aboriginal population	None	No comments
Osberg 2008	1981-2006	All Canadian families	SLID, LFS and various other Statistics Canada data sets	Pre- and post tax total money income	None	No comments	G, X	Increase in inequality over the quarter century due to rapid increase in income at the top end

								of the income distribution and stagnating income elsewhere
Noel and Larocque 2009	2005	On and off reserve Aboriginal and non-Aboriginal economic families	Census 2006	Post-tax (economic family) income	Income poverty, H and LICOs	Off reserve Aboriginal poverty two times higher than non-Aboriginal poverty (21.7% and 11.1%)	None	No comments
Wien 2009	1995, 2000, 2005	On and off reserve Aboriginal and non-Aboriginal population	Census 1996, 2001, 2006	Median pre-tax income and others	Income poverty, H and LICOs	Decline in Aboriginal poverty between 2000 and 2005.	None	No comments
Wilson and Macdonald 2010	1995, 2000, 2005	On and off reserve Aboriginal and the rest of the Canadians 15 years and above with employment	Census 1996, 2001, 2006	Pre-tax median total employment income of an individual	None	No comments	None (Income gap is considered an aspect of inequality)	Marginal improvement in employment income gap

	income (census definition)

Table 4.2.2: Summary of Findings on Gini Coefficient (G_w) and Low Income Rate (Headcount Ratio H)

Indices	Author(s)	1979	1985	1989	1990	1991	1995	1997	2000	2001	2004	2006
Gini Coefficient G_w	**Jankowski and Moazzami (1994)** *Pre-tax annual total individual income*					National 0.400 NW ON Aboriginal <u>1993</u> 0.447						
	Drost and Richards (2003) *Pre-tax total individual income*		On-reserve <u>Aboriginal</u> 0.48 Off-reserve <u>Aboriginal</u> 0.48 Non-<u>Aboriginal</u> 0.46		0.53 0.47 0.44		0.52 0.51 0.47					
	Picot and Myles (2005) *Post-tax/transfer disposable (adult equivalent adjusted) individual income*							0.29 Remained stable from late 1970s to late 1990s	5%-6% increase in G_w between 1990 and 2000			
	Heisz (2007) *Post-tax/ transfer adult equivalent adjusted family market income per person*	0.283		0.277							0.315	

Indices	Author(s)	1979	1985	1989	1990	1991	1995	1997	2000	2001	2004	2006
	Osberg (2008) *Post-tax total money income of families*			No major change in G from mid to late 1980s			Increase in G between early to mid 1990s					G stable since mid-1990s at a higher level
Low income rate/ Headcount Ratio H	**Lee (2000)** *Pre-tax total economic family income per person (LICO)*						Urban poverty 55.6 % Aboriginal 24% non-Aboriginal 11.9 % overall (13.6 in late 1970s)					
	Picot and Myles (2005) *Post-tax/transfer disposable (adult equivalent adjusted) individual income (LIM)*	13.9 % (late 1970s)						11.9 % (late 1990s)	17% of the Aboriginal population were in persistent poverty in 1996-2000			
	Heisz (2007) *Post-tax adult*	0.129		0.093							0.102	

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	equivalent adjusted family market income per person (LIM)												
	NCW (2007) *Pre-tax total economic family income (LICO)*									Off reserve <u>Aboriginal</u> 31 % Non-<u>Aboriginal</u> 12%	Off reserve Aboriginal poverty was two times higher than non-Aboriginal poverty	
	Noel and Larocque (2009) *Post-tax total income (LICO)*								<u>Non-Aboriginal</u> 12.4 % <u>Rural Aboriginal</u> 22.9 % <u>Urban non-CMA Aboriginal</u> 40.4 % <u>Urban CMA Aboriginal</u> 42.4 %			Off-reserve <u>Aboriginal</u> 21.7 % Non-<u>Aboriginal</u> 11.1%

	Wien (2009) *Pre-tax total income for persons living in families (LICO)*											*For 2005* Non-Aboriginal 11.6 % Rural Aboriginal 18.1 % Urban non-CMA Aboriginal 33. % Urban CMA Aboriginal 38.3 %

CHAPTER 5

MEASURING ABORIGINAL AND NON-ABORIGINAL POVERTY AND INCOME INEQUALITY: METHODOLOGY, RESULTS AND DISCUSSIONS

As discussed in chapter 3, measurement of poverty involves several steps: choosing a poverty line to identify the people whose income falls below it, choosing an appropriate poverty index, and aggregating the poor by using the index. This chapter discusses the above steps concerning measurement of off-reserve Aboriginal and non-Aboriginal poverty in Canada for the period 1996-2007. Income inequality measured for the Aboriginal and non-Aboriginal population groups is also considered. The chapter also reviews the datasets used, variables selected, methodology applied and some related methodological issues. Finally, the chapter presents and discusses the results.

5.1 Poverty Line and Poverty Index

The Low Income Cut-offs (LICOs), described in chapter 3, are used as the poverty lines for measurement of off-reserve Aboriginal and non-Aboriginal poverty. These LICOs are not available for Yukon, the Northwest Territories, Nunavut and Indian reserves. Consequently, these regions are excluded from this research. These LICOs are available only for before-tax or pre-tax (total) income and after-tax or post-tax income (described below), not for other types of income such as market income. Because of this restrictive nature of the LICOs, it is difficult to find poverty levels at different types of income. For example, one will not be able to see the effect of government intervention on market income and how that changes poverty levels as LICOs are not available for market income.

Three commonly known poverty indices - Headcount Ratio (H), Income Gap Ratio (I), and Poverty Gap Index (HI) – are chosen along with the Sen Index (S), the decomposed version of Sen-Shorrocks-Thon Index (SST_O) and the Foster-Greer-Thorbecke Index (FGT) for $\alpha = 1$ and 2. All these indices are discussed in chapter 3. The first two indices are chosen for their widespread use and understandable interpretations. The HI is considered a good measure of poverty, widely used by organizations like the World Bank, and HI = FGT for $\alpha = 1$. The S is looked at as it is the first axiomatically derived poverty index that addresses inequality among the poor. A limitation of the first three indices is that they do not address inequality among the poor. SST_O, an axiomatically correct index as discussed in chapter 3, sheds light on the contributing factors to poverty by decomposing S. FGT for $\alpha=2$ is another axiomatically correct index that emphasizes the income gaps of the poor and used by the World Bank as the Squared Poverty Gap (HI2) . The Gini Coefficient (G) is used for measurement of inequality. This coefficient is also a part of the S and SST_O.

5.2 Data

Data are collected from the Survey of Labour and Income Dynamics (SLID) for the period 1996-2007, and also from census for the years 1996, 2001 and 2006. The unit of analysis is economic family and unattached individual not in an economic family as LICOs are applicable to economic families and unattached individuals. Economic family is defined below. Unattached individuals are considered economic families of size one, whereas economic families have a size of two and above.

5.2.1 Census

The census is conducted by Statistics Canada every five years. It covers every person living in Canada and Canadians living abroad. The census is the major source of demographic information. The first census after Canadian confederation was conducted in 1871. Since 1956, the census has been conducted every five years. The five-year census was made into a statutory requirement by the Statistics Act of 1971.

Since 1971 the practice of self-enumeration, that is, respondents answering the questions themselves, has been put into place. 80 per cent of the total sample is provided with a mandatory short questionnaire and the remaining 20 per cent with a mandatory long questionnaire. However, starting from the 2011 Census, the mandatory long form questionnaire has been discontinued in favour of a voluntary long form questionnaire given to 33 percent of the population under the banner of National Household Survey (NHS).

Such a change has received vehement opposition from various quarters. Dillon (2010) lists some of the reasons for opposition. First, this change will result in non-response from particular subgroups of the population making the new census data non-comparable to the old ones; second, Canada's century old national data series will be interrupted, and third, Canada will lose its place in the International Integrated Public-use Microdata Series (IPUMSi) which showcases harmonized census data from fifty five countries. IPUMSi is considered "the world's largest archive of publicly available census samples". (Dillon, 2010, p. 391)

The Canadian Council on Social Development (CCSD) takes a strong stand against the change by arguing that the NHS will not be able to capture a comprehensive picture of Canada. Because of its voluntary nature, minority groups, immigrants, Aboriginal people, very poor and very rich will not respond. As a result Canada will be left with "a skewed picture of mostly middle class Canadians. We will look less diverse, less poor, ultimately less in need of government support" (CCSD, 2010, p. 2). But perhaps the strongest stand was taken by the then Chief Statistician of Statistics Canada, Munir Sheikh. He resigned as a protest to these changes.

Currently, the census gathers information on North American Indian, Métis and Inuit, registered and unregistered Indians, and members of an Indian Band or a First Nation. The information is available for various geographic levels such as Canada, provinces and territories, metropolitan areas, urban and rural areas, communities including Indian reserves and settlements, census tracts and dissemination areas. Discontinuation of the mandatory long form census questionnaire may make much of the information either unavailable or questionable.

5.2.2 SLID

The SLID is Statistics Canada's one prominent source of data on income of Canadian families, households and individuals. Before the SLID, the Survey of Consumer Finance (SCF) had been the major source of data on family income since 1976. The SLID was first introduced in 1993 and officially replaced the SCF in 1998. Between 1993 and 1997, both the SLID and the SCF collected information jointly.

The SLID is an annual household survey covering all individuals of Canada except the residents of Yukon, the Northwest Territories and Nunavut, residents of institutions and persons living on Indian reserves or in military barracks. The SLID sample is comprised of two panels, each consisting of roughly 17,000 households and about 34,000 adults. As a new panel is introduced every three years, two panels always overlap.

There are several advantages of using the SLID. First and foremost, it allows understanding of annual changes in Canadian income over a long period of time. Second, the SLID interviews the same group of people for six years in a row. This provides a better insight on the Canadian income profile and its changes over time. Third, by combining survey data with administrative data, the SLID provides information on a wide range of subjects such as human capital, labour force experiences and demographic characteristics. The relatively large sample and depth of content make the SLID a distinctive and valuable dataset.

The census years 1996, 2001 and 2006 are chosen for this research as they provide comparable definitions of various Aboriginal variables discussed below. The census and the SLID are used side by side in this research to see if similar trends are found in both the datasets. Since the census year starts from 1996, a similar starting point is chosen for the SLID.

5.3 Variables

The variables chosen from the datasets are listed in Tables 5.3.1 and 5.3.2. The following definitions of some of the key variables are provided by Statistics Canada.

Aboriginal population: According to the census, the Aboriginal identity population refers to those persons who self-reported being North American Indian, Métis or Inuit, and/or those who self-reported being a Treaty Indian or a Registered Indian, as defined by the Indian Act of Canada, and/or those who self-reported being a member of an Indian Band and/or a First Nation. The relevant information is derived by asking three different questions related to identity, Treaty or Registered Indian and Band or First Nation membership. In 1991 and previous censuses, the Aboriginal population was defined with respect to ethnic origin. In the 1996 Census a direct question on how an individual perceives his/her Aboriginal identity was included along with the questions related to Treaty or Registered Indian and Band or First Nation membership. This new question required self-reporting of identity (North American Indian, Métis, or Inuit) by the respondent. The question was subsequently used in the 2001 and 2006 Censuses. The total Aboriginal count derived on the basis of self-reported identity, Treaty or Registered Indian and Band or First Nation membership is comparable across the Censuses of 1996, 2001 and 2006.

The counts associated with the Aboriginal identity variable are affected by the incomplete enumeration of certain Indian reserves and Indian settlements. Incomplete enumeration arises due to non-participation of the respondents or some interruption before completion of enumeration. For example, in 2006, a total of 22 Indian reserves and Indian settlements were incompletely enumerated by the census. In 2001 the number was 30, and in 1996 the number was 77. The population of these 22, 30 and 77 communities are not included in the census counts for 2006, 2001 and 1996. Aboriginal identity count is also affected by under-coverage due to individuals being absent on the census day, and exclusion of

individuals living in institutions and living abroad. However, as this research focuses on off-reserve Aboriginal population, incomplete enumeration is less of an issue.

The SLID does not have a comparable Aboriginal identity variable like the census. This point is further elaborated below in the section on methodological issues.

Economic family: Economic family is defined in the following manner by Statistics Canada in its website.

> Economic family refers to a group of two or more persons living in the same dwelling and related to each other by blood, marriage, common-law or adoption. A couple may be of opposite or same sex. Foster children are included. By definition, all persons who are members of a census family are also members of an economic family. Examples of the broader concept of economic family include the following: two co-resident census families who are related to one another are considered one economic family; co-resident siblings who are not members of a census family are considered as one economic family; and, nieces or nephews living with aunts or uncles are considered one economic family.

Total income and after-tax income: According to the census total income or total money income or before-tax or pre-tax income refers to income of a person 15 years and older received from the following sources in a calendar year: wages and salaries (total), net farm income, net non-farm income from unincorporated business and/or professional practice, child benefits, Old Age Security pension and Guaranteed Income Supplement, benefits from Canada or Quebec Pension Plan, benefits from Employment Insurance, other income from government sources, dividends, interest on bonds, deposits and

savings certificates, and other investment income, retirement pensions, superannuation and annuities, including those from RRSPs and RRIFs, and other money income. The SLID adds a few more items to total income such as self-employment income, social assistance, workers compensation, GST/HST credit, and provincial/ territorial tax credits. To get the after-tax or post-tax income, only income tax is deducted from the total income.

Table 5.3.1: Major Variables Chosen from the Census Datasets

Variable name	Variable definition Census 2006	Variable definition Census 2011	Variable definition Census 1996
POP	Population size group of current census subdivision of residence (2006) - Derived	Population size group of current census subdivision of residence (2001)	Population size group of current census subdivision of residence (1996)
AbDerr / ABDERR	Aboriginal identity – Derived – Summary	Aboriginal identity – Summary	Aboriginal population - Derived
InacFlgH/ INACFLGH	On reserve – Derived	On reserve	N/A
EF_RP	Economic family reference person	Economic family reference person	Economic family reference person
EfCnt_PP	Number of people in economic family – Derived	N/A	N/A
EfInc_PP	Economic family income for all persons-Derived	N/A	N/A
EfInc_AT_PP	After-tax income of economic families for all persons-Derived	N/A	N/A
Efinc/ EFINC	Economic family total income - Derived	Economic family total income	Economic family total income
TotInc/ TOTINC	Total income	Total income	Total income
DocTP/DOCTP	Document type classification (Economic family)	Document type classification (person)	Document type classification (person)
CompW2/ COMPW2	Composite weight	Composite weight	Composite weight
ID	Index Id (household)		Index ID (household)
E_FamPp/E_Fam/ E_FAM	Economic family identifier within the household - Derived	Economic family number	Economic family number
PersNo/PERSNO	Person number after reorder-Derived	Person number after reorder	Person number after reorder

Note: N/A = variable not available

Table 5.3.2: Major Variables Chosen from the SLID Dataset

Variable name	Variable definition
abortg15	Flag - Member of the Aboriginal target group for employment equity purposes
ttinc27	Economic family total - total income (before taxes)
atinc27	Economic family total - after tax income
icswt26	Combined SCF/SLID sample integrated cross-sectional weight
wtcsld26	Regular integrated cross sectional weight for SLID.
licoa27	After tax low income cut-off (LICO) for the family for the reference year (1992 base)
licoag27	Low income gap - after tax
licob27	Before tax low income cut-off (LICO) for the family for the reference year (1992 base)
licobg27	Low income gap - before tax
licofa27	Family after tax income is below LICO for the reference year (base 1992)
licofb27	Family before tax income is below LICO for the reference year (base 1992)

5.4 Methodological Issues

The Census 2006 contains data on both before- and after-tax income, but the Census 2001 and 1996 have data on before-tax income only. The SLID contains data on both before- and after- tax income for all the years between 1996 and 2007. As a result, the census datasets are used only for before-tax income analysis, whereas the SLID datasets are used for both before- and after-tax income analyses.

Economic families and unattached individuals with positive income are considered. This is done in line with Osberg's (2000) argument. Negative income can be a result of substantial capital loss for families with substantial initial wealth. Osberg (2000) recommends deleting such observations which are likely to be few in number. Zero income is either implausible or a measurement error. Since it can make a difference to the SST index, Oberg and Xu (2000) recommends deleting observations with zero income.

In the census, a respondent gets to declare his or her Aboriginal identity by choosing one of the three options given: North American Indian, Inuit and Métis. Furthermore, a respondent also gets to declare if he or she is a Treaty or Registered Indian, or a member of an Indian Band or a First Nation. The variable AbDerr/ABDERR summarises the responses of the respondents regarding all the above categories. In this research, that segment of the off-reserve Aboriginal population that declared its identity in one way or the other and summarised by the AbDerr/ABDERR variable is considered.

In the SLID, variable abortg15 is derived using information from two questions: 1) DE_Q125 Are you a Treaty Indian or a Registered Indian as defined by the Indian Act of Canada? and 2) DE_Q130 To which ethnic or cultural group(s) did your ancestors

belong? If a person answered "yes" to question DE_Q125 and/or "Cree", "Micmac", "Métis" or "Inuit" to question DE_Q130, the variable abortg15 will have a value of 1 for that person implying Aboriginal identity/ancestry of the person. So the difference between the census and the SLID dataset with respect to Aboriginal population is that in the case of the census only Aboriginal identity population is considered, and in the case of the SLID dataset, both Aboriginal identity (Treaty or Registered Indian) and ancestry are considered. A point to note here is that the SLID does not identify Aboriginal population in the same manner as the census does.

In the Census 2006 and 2001 datasets there is a variable called InacFlgH/ INACFLGH that indicates whether the respondent is from a reserve or not. However, in the 1996 Census data, such a variable is absent. That information can, however, be derived by first looking at the census sub-division (CSD) types of the Census 1996 and then comparing these types with those of the Census 2001 and 2006. The CSDs that are associated with the on-reserve variable in the latter two datasets are used as filters to screen out the on-reserve population in the 1996 dataset. However, this indirect method may result in a possible lower count of on-reserve Aboriginal population and a higher count of off-reserve Aboriginal population, but the differences are expected to be minimal.

There is no variable related to family size in the Census 2001 and 1996. This variable is created by concatenating the variables ID and E_FAM.

5.5 Methodology

By using the weighted census datasets, poverty indices are calculated for the years 1996, 2001, and 2006 for both the off-reserve Aboriginal and non-Aboriginal population. First,

the datasets are reduced to economic family and unattached individual level, for each year and for each group of the population. Before-tax LICOs are then determined for each respondent on the basis of economic family size and CSD population. For this purpose, the before-tax LICO matrices for the years 1996, 2001, and 2006 provided by Statistics Canada are used. Next, the before-tax LICOs are compared with before-tax income of economic families and unattached individuals. Those economic families and unattached individuals having before-tax incomes below the corresponding before-tax LICOs are identified as poor. For the poor economic families and unattached individuals, poverty gap ratios and mean incomes are calculated. Also calculated are the Gini Coefficient for the income distribution of the poor (G_p) and the whole population group (G_w), and the Gini coefficient of the poverty gap ratios of the whole population group (G_x). Then the poverty indices are calculated using the formulae stated above in chapter 3.

A similar exercise is carried out for the weighted SLID datasets for the years 1996-2007. However, in the SLID, data is available at economic family and unattached individual level. The before- and after-tax LICOs are given, so are the low income status (that is, if before- and after-tax income is below the before- and after-tax LICO) and the poverty gap ratios. The Gini Coefficients and the poverty indices are calculated using the formulae given above in chapter 3. The before-tax LICO matrix for 2007 is given in the appendix (Table 1) as an example.

5.6 Results

In this section the main results are summarized with corresponding tables. All the graphs regarding the results are given in the appendix. Discussions on the results appear in a following section. Comparison of findings with results from studies covered in chapter 4 is also dealt with in that section.

5.6.1 SLID Results

Results related to the SLID dataset are discussed here. According to Table and graph 5.6.1.1, the Headcount Ratio (H), showing the proportion of economic families and unattached individuals in poverty, declines over time for both Aboriginal and non-Aboriginal population. The decline in Aboriginal before-tax H is significantly pronounced between 1996 and 2000 compared to the period 2000 onwards. Between 2000 and 2006, H remains almost stable and then shows some declining trend starting from 2006. The non-Aboriginal before-tax H declines rather modestly between 1996 and 2001, and remains stable between 2001 and 2007 with a little indication of decline from 2005. The gap between before-tax Aboriginal and non-Aboriginal H reduces significantly between 1996 and 2000, becomes steady between 2000 and 2006 and then declines a little in 2007. Aboriginal after-tax H declines significantly between 1996 and 1999, and then declines steadily with a bump in 2003. Non-Aboriginal after-tax H shows a steady declining trend all along and becomes stable from 2001 onwards. The gap between after-tax Aboriginal and non-Aboriginal H falls significantly between 1996 and 1999, falls steadily between 1999 and 2002, goes up a bit between 2002 and 2006 and then declines a little in 2007. H is higher for the Aboriginal population compared to the non-Aboriginal

population. Before-tax H is higher than after-tax H for both the population groups as discussed in chapter 3.

Table 5.6.1.1: Headcount Ratio (H)

Year	Aboriginal		Non-Aboriginal	
	Before-tax	**After-tax**	**Before-tax**	**After-tax**
1996	0.48	0.41	0.25	0.19
1997	0.49	0.39	0.24	0.19
1998	0.41	0.33	0.23	0.17
1999	0.35	0.27	0.22	0.16
2000	0.31	0.25	0.21	0.16
2001	0.30	0.23	0.20	0.14
2002	0.30	0.21	0.20	0.15
2003	0.31	0.26	0.20	0.14
2004	0.31	0.22	0.20	0.14
2005	0.30	0.23	0.20	0.14
2006	0.29	0.24	0.18	0.14
2007	0.26	0.20	0.18	0.13

Note:

Range of H for Aboriginal poor population before tax 0.49-0.26

 Range of h for Aboriginal poor population after tax 0.41-0.20

 Range of H for non-Aboriginal poor population before tax 0.25-0.18

Range of H for non-Aboriginal poor population after tax 0.19-0.13

Table and graph 5.6.1.2 show the Income Gap Ratio (I). This index measures the depth of poverty of economic families and unattached individuals without taking the headcount of poverty into account. No clear trend is observable for the Aboriginal I for both before- and after-tax income. The before- and after-tax non-Aboriginal I remains mostly stable.

For the Aboriginal and the non-Aboriginal population groups, I is somewhat close but mostly higher for the Aboriginal group indicating more depth in poverty for this group.

Table 5.6.1.2: Income Gap Ratio for the Poor Population (I)

Year	Aboriginal		Non-Aboriginal	
	Before-tax	After-tax	Before-tax	After-tax
1996	0.40	0.34	0.37	0.35
1997	0.39	0.35	0.37	0.35
1998	0.43	0.40	0.36	0.35
1999	0.42	0.40	0.37	0.35
2000	0.41	0.37	0.37	0.35
2001	0.39	0.37	0.36	0.35
2002	0.38	0.38	0.35	0.34
2003	0.42	0.37	0.34	0.34
2004	0.36	0.35	0.36	0.35
2005	0.38	0.34	0.37	0.36
2006	0.39	0.33	0.37	0.36
2007	0.38	0.36	0.36	0.37

Note:

Range of I for Aboriginal poor population before tax 0.43-0.36

 Range of I for Aboriginal poor population after tax 0.40-0.33

 Range of I for non-Aboriginal poor population before tax 0.37-0.34

Range of I for non-Aboriginal poor population after tax 0 .37-0.35

In Table and graph 5.6.1.3, the Poverty Gap Index for economic families and unattached individuals (HI) shows a declining trend similar to the H, for both the population groups. This HI is equivalent to FGT when $\alpha = 1$ and accounts for both incidence and depth of

poverty. Aboriginal before- and after-tax HI declines rapidly between 1996 and 2000. Then the decline becomes a little slow, stabilizes with a little bump in 2003 and then declines in 2007. The decline in non-Aboriginal before- and after-tax HI is quite modest and stabilizes between 2000 and 2007. The non-Aboriginal before-tax HI declines modestly in 2007. The slight hike in Aboriginal before- and after-tax HI in 2003 could be due to the increase in I in case of before-tax income and increase in H in the after-tax income context. The gap between Aboriginal and non-Aboriginal before-tax HI declines rapidly between 1996 and 2000, and stabilizes afterwards with the exception for 2003. The gap between Aboriginal and non-Aboriginal after-tax HI also falls between 1996 and 2000, and becomes steady afterwards with the exception for 2003. In Table and graph 5.6.1.4, the Squared Poverty Gap (HI2) also shows somewhat similar declining trend as the HI. The HI2 is equivalent to FGT when $\alpha = 2$ as discussed previously in chapter 3. The non-Aboriginal before- and after-tax HI2 become steady from 1998 onwards.

Table 5.6.1.3 Poverty Gap Index (HI)

Year	Aboriginal		Non-Aboriginal	
	Before-tax	**After-tax**	**Before-tax**	**After-tax**
1996	0.19	0.14	0.09	0.07
1997	0.19	0.14	0.09	0.07
1998	0.18	0.13	0.08	0.06
1999	0.15	0.11	0.08	0.06
2000	0.13	0.09	0.08	0.05
2001	0.12	0.09	0.07	0.05
2002	0.11	0.08	0.07	0.05
2003	0.13	0.10	0.07	0.05
2004	0.11	0.08	0.07	0.05
2005	0.11	0.08	0.07	0.05
2006	0.11	0.08	0.07	0.05
2007	0.10	0.07	0.06	0.05

Note:

Range of HI for Aboriginal population before tax 0 .19-0.10

Range of HI for Aboriginal population after tax 0.14-0.07

Range of HI for non-Aboriginal population before tax 0 .09-0.06

Range of HI for non-Aboriginal population after tax 0 .07-0.05

Table 5.6.1.4: Squared Poverty Gap (HI2)

Year	Aboriginal		Non-Aboriginal	
	Before-tax	After-tax	Before-tax	After-tax
1996	0.10	0.07	0.050	0.040
1998	0.10	0.06	0.040	0.040
1999	0.08	0.06	0.040	0.030
2000	0.07	0.05	0.040	0.030
2001	0.06	0.05	0.040	0.030
2002	0.06	0.05	0.040	0.030
2003	0.07	0.05	0.040	0.030
2004	0.07	0.04	0.040	0.030
2005	0.06	0.04	0.040	0.030
2006	0.06	0.04	0.038	0.027
2007	0.06	0.04	0.035	0.026

Note:

Range of HI2 for Aboriginal population before tax 0 .10-0.06

Range of HI2 for Aboriginal population after tax 0 .07-0.04

Range of HI2 for non-Aboriginal population before tax 0 .05-0.04

Range of HI2 for non-Aboriginal population after tax 0 .04-0.03

According to Table and graph 5.6.1.5, before-tax mean incomes of the Aboriginal and non-Aboriginal poor economic families and unattached individuals are quite close and show an overall upward trend along with overall declining trend in poverty. The similarity in mean income of the two poor population groups could be due to the fact that transfers and tax credits account for most of the income of both the groups. The non-Aboriginal before-tax mean income of the poor shows a steadier upward trend than that

of the Aboriginal poor. In case of the after-tax income, which is obtained by subtracting income taxes, a similar pattern is observed for the Aboriginal and non-Aboriginal poor population groups. For the Aboriginal poor, some decline in before- and after-tax income is observed in the late 1990s.[7]

Table 5.6.1.5: Mean Income of the Poor in Current Dollars

Year	Aboriginal		Non-Aboriginal	
	Before-tax	**After-tax**	**Before-tax**	**After-tax**
1996	11,830	10,500	12,750	10,950
1997	12,200	10,530	12,830	10,970
1998	11,590	9,720	12,950	10,840
1999	11,770	9,980	12,970	10,960
2000	12,620	11,160	13,230	11,270
2001	13,730	11,380	13,540	11,340
2002	14,200	11,700	14,330	11,940
2003	13,450	12,100	14,650	12,300
2004	14,740	12,000	14,670	12,190
2005	14,700	12,700	14,680	12,000
2006	15,000	13,200	15,100	12,600
2007	15,000	12,400	15,500	12,400

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[7] Though mean income of the poor shows an overall increasing trend and H shows an overall declining trend, for some specific years these trends are not obvious. For these years, possible explanation can be found by looking at the LICOs which are generally increasing from year to year, number of families in poverty, total number of families, and changes in income of the poor. In order to get a sense of change in the income of the poor, we can look at the Gini Coefficient of the poor (G_p). The change in G_p is an indication of the change in the income distribution of the poor - increase in G_p indicating a more disequalizing change and decrease in G_p indicating a more equalizing change.

Note:

Range of mean income of Aboriginal poor population before tax $15,000-$11,590

Range of mean income of Aboriginal poor population after tax $13,200-$9,720

Range of mean income of non-Aboriginal poor population before tax $15,100-$12,750

Range of mean income of non-Aboriginal poor population after tax $12,600-$10,950

As can be seen from Table and graph 5.6.1.6, the Gini Coefficient for poor economic families and unattached individuals (G_p) before and after-tax income is higher for the non-Aboriginal group compared to the Aboriginal group suggesting greater dispersion of income among the non-Aboriginal poor compared to the Aboriginal poor. The after-tax G_p is mostly higher than the before-tax G_p for the non-Aboriginal group. On the other hand, for the Aboriginal group, before and after-tax G_p do not show any such particular pattern.[8] For both the groups, G_p fluctuates within a small range.

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[8] A possible explanation of behaviour of after-tax G_p can be that income taxes are less at lower levels of income and more at higher levels of income, whereas transfers are more at lower levels of income and less at higher levels of income. So the poor are likely to be less affected by the progressive tax system, and deduction of income taxes alone from the income of the poor cannot show the full impact of the redistributive role of the tax-transfer system on inequality of the poor.

Table 5.6.1.6: Gini Coefficient of Inequality for the Poor (G$_p$)

Year	Aboriginal		Non-Aboriginal	
	Before-tax	**After-tax**	**Before-tax**	**After-tax**
1996	0.31	0.32	0.33	0.36
1997	0.28	0.30	0.33	0.32
1998	0.30	0.27	0.32	0.34
1999	0.27	0.27	0.32	0.34
2000	0.26	0.30	0.31	0.37
2001	0.30	0.23	0.30	0.33
2002	0.27	0.26	0.32	0.35
2003	0.25	0.29	0.31	0.29
2004	0.29	0.29	0.33	0.36
2005	0.29	0.28	0.33	0.32
2006	0.30	0.32	0.33	0.36
2007	0.27	0.26	0.33	0.35

Note:

Range of Gini for Aboriginal poor population before tax 0 .31-0.26

Range of Gini for Aboriginal poor population after tax 0 .32-0.26)

Range of Gini for non-Aboriginal poor population before 0 .33-0.30

Range of Gini for non-Aboriginal poor population after tax 0 .37-0.32

Gini Coefficients for all economic families and unattached individuals (G$_w$) are shown in Table and graph 5.6.1.7. For the non-Aboriginal population, G$_w$ is more or less stable and in line with overall Gini Coefficient discussed by Picot and Myles (2005), Heisz (2007) and Osberg (2008). After-tax coefficients are uniformly less than the before-tax ones, showing the general progressive nature of the income tax system. For the Aboriginal population, after-tax coefficients are also uniformly lower than before-tax ones,

suggesting overall progressivity of income tax, and until 2002 were below those of the non-Aboriginal population. But Aboriginal inequality on both before- and after-tax basis seems to have been much higher between 2001 and 2006 than in the preceding period, and was equal to and in some years higher than Non-Aboriginal inequality. In 2007 both before and after-tax G_w's for the Aboriginal population fell back to pre-2002 patterns. Overall, the Aboriginal G_w indicates relative stability similar to non-Aboriginal G_w.

Table 5.6.1.7: Gini Coefficient for the Whole Population (G_w)

Year	Aboriginal		Non-Aboriginal	
	Before-tax	**After-tax**	**Before-tax**	**After-tax**
1996	0.40	0.35	0.43	0.38
1997	0.40	0.34	0.44	0.39
1998	0.39	0.35	0.44	0.40
1999	0.43	0.38	0.44	0.40
2000	0.42	0.38	0.45	0.41
2001	0.40	0.35	0.44	0.40
2002	0.43	0.40	0.43	0.39
2003	0.43	0.39	0.43	0.39
2004	0.44	0.41	0.43	0.39
2005	0.43	0.40	0.43	0.39
2006	0.43	0.38	0.43	0.39
2007	0.40	0.36	0.42	0.39

Note:

Range of Gini for Aboriginal population before tax 0 .44-0.39

Range of Gini for Aboriginal population after tax 0 .41-0.34

Range of Gini for non-Aboriginal population before tax 0 .45-0.42

Range of Gini for non-Aboriginal population after tax 0 .41-0.38

The Sen Index for economic families and unattached individuals (S), shown in Table and graph 5.6.1.8, is higher for the Aboriginal population group for both before- and after-tax income compared to the non-Aboriginal group suggesting higher poverty for the former group. This could be due to before- and after-tax higher H and mostly higher I for the Aboriginal group. For each group, the after-tax S is lower than the before-tax S as discussed in chapter 3. S shows mostly similar trends as the H. Decline in the Aboriginal S is much more noticeable than the non-Aboriginal S. The Aboriginal before-tax S declines noticeably between 1996 and 2001 compared to the period 2001 onwards. Between 2001 and 2006, S remains somewhat stable and then declines between 2006 and 2007. The non-Aboriginal before-tax S declines rather modestly between 1996 and 2001, and remains steady between 2001 and 2005 with indication of decline from 2005. Aboriginal after-tax S declines significantly between 1996 and 2002, goes up in 2003, remains steady at a higher level up to 2005, and then steadily declines from 2006. Non-Aboriginal after-tax S shows a steady decline up to 2001, and then becomes stable from 2001 onwards, and falls a little between 2006 and 2007. For all groups, S is significantly lower in 2007 than in 1996.

Table 5.6.1.8: Sen Index (S)

Year	Aboriginal		Non-Aboriginal	
	Before-tax	**After-tax**	**Before-tax**	**After-tax**
1996	0.25	0.19	0.12	0.09
1997	0.24	0.17	0.12	0.08
1998	0.23	0.17	0.11	0.08
1999	0.20	0.14	0.11	0.07
2000	0.18	0.13	0.10	0.07
2001	0.16	0.11	0.09	0.06
2002	0.16	0.11	0.09	0.06
2003	0.17	0.13	0.09	0.06
2004	0.17	0.12	0.09	0.06
2005	0.16	0.12	0.09	0.06
2006	0.16	0.12	0.08	0.06
2007	0.12	0.08	0.08	0.05

Note:

Range of S for Aboriginal population before tax 0 .25-0.12

Range of S for Aboriginal population after tax 0 .19-0.08

Range of S for non-Aboriginal population before tax 0 .12-0.08

Range of S for non-Aboriginal population after tax 0 .09-0.05

From the expression of S, it is not always obvious which component of S is driving the change in S. For this purpose, we look at the multiplicative form of the Sen-Shorrocks-Thon Index (SST_O). As described in chapter 3, this index is an improved modification of S and the log difference of SST_O indentifies the sources of changes in poverty, that is, if the change in the overall poverty index is due to change in incidence of poverty (H),

depth of poverty (I) or change in inequality of poverty gap ratios of the whole population (G_x).

The percentage changes of the constituents of the SST_O, for economic families and unattached individuals in both the population groups and for both before and after-tax income are shown in the following Tables 5.6.1.9a, 9b, 9c, and 9d.

Table 5.6.1.9a: SST_O and the Percentage Changes – Aboriginal Before-tax

Year	SST_O	$\%SST_O$	%H	%I	%1+Gx
1996	0.294				
1997	0.286	-0.028	0.001	-0.042	0.013
1998	0.290	0.013	-0.112	0.108	0.018
1999	0.263	-0.096	-0.081	-0.031	0.016
2000	0.230	-0.135	-0.130	-0.016	0.011
2001	0.203	-0.125	-0.094	-0.045	0.013
2002	0.205	0.010	0.027	-0.018	0.001
2003	0.233	0.126	0.033	0.098	-0.005
2004	0.200	-0.153	0.017	-0.160	-0.009
2005	0.204	0.021	-0.024	0.051	-0.006
2006	0.193	-0.054	-0.090	0.022	0.013
2007	0.171	-0.123	-0.112	-0.027	0.017

Note:

$SST_O = HI (1+ G_x)$

The percentage changes are calculated by using the following equation:

$\Delta \ln (SST_O) = \Delta \ln (H) + \Delta \ln (I) + \Delta \ln (1+G_x)$

Range of SST_O for Aboriginal population before tax 0 .171-0.294

Table 5.6.1.9b: SST_O and the Percentage Changes – Aboriginal After-tax

Year	SST_O	$\%SST_O$	%H	%I	%1+Gx
1996	0.212				
1997	0.201	-0.053	-0.087	0.022	0.012
1998	0.221	0.094	-0.045	0.128	0.011
1999	0.187	-0.163	-0.177	-0.001	0.015
2000	0.161	-0.152	-0.088	-0.070	0.006
2001	0.144	-0.114	-0.115	-0.010	0.012
2002	0.147	0.025	-0.013	0.034	0.004
2003	0.165	0.111	0.140	-0.018	-0.010
2004	0.140	-0.159	-0.087	-0.070	-0.002
2005	0.145	0.031	0.041	-0.002	-0.008
2006	0.131	-0.103	-0.076	-0.037	0.010
2007	0.113	-0.146	-0.228	0.066	0.016

Note:

$SST_O = HI\,(1+ G_x)$

The percentage changes are calculated by using the following equation:

$\Delta \ln (SST_O) = \Delta \ln (H) + \Delta \ln (I) + \Delta \ln (1+G_x)$

Range of SST_O for Aboriginal population after tax 0 .113-0.221

As can be seen from the above tables, for the Aboriginal population with before- and after-tax income, the declining trend in poverty measured by the percentage change in SST_O is mainly due to changes in the H, though the changes in I do play a role. For example, between 1998 and 1999, the Aboriginal before-tax SST_O fell by 9.6 per cent. This fall was mainly due to a fall in H by 8.1 per cent backed by a fall in I by 3.1 per cent

and countered by 1.6 per cent increase in 1+Gx. Aboriginal before- and after-tax SST_O show a trend similar to H, HI, HI2 and S discussed above. The changes in inequality are less prominent than the changes in H and I, and the changes in inequality are much less prominent in the case of after-tax income.

Table 5.6.1.9.c: SST_O and the Percentage Changes – Non-Aboriginal Before-tax

Year	SST_O	$\%SST_O$	%H	%I	%1+Gx
1996	0.147				
1997	0.145	-0.014	-0.021	0.005	0.002
1998	0.136	-0.067	-0.054	-0.018	0.005
1999	0.133	-0.018	-0.039	0.020	0.001
2000	0.127	-0.048	-0.047	-0.003	0.002
2001	0.117	-0.082	-0.077	-0.010	0.005
2002	0.111	-0.048	-0.016	-0.033	0.001
2003	0.110	-0.014	-0.019	0.004	0.000
2004	0.110	-0.001	-0.030	0.028	0.002
2005	0.113	0.026	0.013	0.013	0.000
2006	0.104	-0.078	-0.083	0.001	0.003
2007	0.094	-0.106	-0.087	-0.023	0.004

Note:

$SST_O = HI (1+ G_x)$

The percentage changes are calculated by using the following equation:

$\Delta \ln (SST_O) = \Delta \ln (H) + \Delta \ln (I) + \Delta \ln (1+G_x)$

Range of SST_O for non-Aboriginal population before tax 0 .094-0.147

Table 5.6.1.9d: SST$_O$ and the Percentage Changes – Non-Aboriginal After-tax

Year	SST$_O$	%SST$_O$	%H	%I	%1+Gx
1996	0.098				
1997	0.098	-0.004	-0.019	0.013	0.001
1998	0.092	-0.066	-0.084	0.013	0.004
1999	0.089	-0.027	-0.030	0.001	0.002
2000	0.084	-0.061	-0.051	-0.010	0.000
2001	0.075	-0.113	-0.112	-0.005	0.004
2002	0.071	-0.051	-0.032	-0.031	0.012
2003	0.067	-0.058	-0.012	-0.035	-0.012
2004	0.071	0.056	-0.022	0.078	0.000
2005	0.074	0.039	0.010	0.028	0.001
2006	0.067	-0.099	-0.090	-0.010	0.001
2007	0.061	-0.092	-0.114	0.018	0.004

Note:

$SST_O = HI (1+ G_x)$

The percentage changes are calculated by using the following equation:

$\Delta \ln (SST_O) = \Delta \ln (H) + \Delta \ln (I) + \Delta \ln (1+G_x)$

Range of SST$_O$ for non-Aboriginal population after tax 0 .061-0.098

In the above two tables, changes in poverty for the non-Aboriginal population group are shown, on a before- and after-tax income basis. Similar to H, HI, HI2 and S, SST$_O$ declines, and it declines rather steadily with weak impact of I and $1+G_x$ and a dominant impact of H. Changes in inequality for the non-Aboriginal population are very nominal.

5.6.2 Census Results

The SLID data above give the year-to-year poverty picture for the Aboriginal identity and ancestry population living off-reserve along with non-Aboriginal population. To see if the same picture holds while using the census data and off-reserve Aboriginal identity population, information for the census years 1996, 2001 and 2006 is used to calculate the poverty and inequality indices for economic families and unattached individuals for both population groups. The indices are calculated by using before-tax income, the only data available in the census. The results are presented in Tables 5.6.2.1 and 5.6.2.2 below. Table 5.6.2.3 presents the after-tax data for the year 2006.

Table 5.6.2.1: SLID and Census Results Compared - Aboriginal Before-tax

	Census			SLID		
	1996	**2001**	**2006**	**1996**	**2001**	**2006**
H	0.50	0.41	0.35	0.48	0.30	0.29
I	0.50	0.49	0.43	0.40	0.39	0.39
HI	0.25	0.20	0.15	0.19	0.12	0.11
HI2	0.17	0.13	0.07	0.10	0.06	0.06
Mean Income ($) of Poor	10,400	11,500	14,000	11,830	13,730	15,000
G_p	0.32	0.33	0.32	0.31	0.30	0.30
G_w	0.46	0.45	0.43	0.40	0.40	0.43
S	0.32	0.27	0.21	0.25	0.16	0.16
SST_O	0.414	0.345	0.260	0.29	0.20	0.19

Table 5.6.2.2: SLID and Census Results Compared – Non-Aboriginal Before-tax

	Census			SLID		
	1996	**2001**	**2006**	**1996**	**2001**	**2006**
H	0.24	0.21	0.19	0.25	0.20	0.18
I	0.42	0.42	0.40	0.37	0.36	0.37
HI	0.10	0.09	0.08	0.09	0.07	0.07
HI2	0.06	0.05	0.05	0.05	0.04	0.04
Mean Income ($)						
of Poor	11,100	12,100	14,100	12,750	13,540	15,100
G_p	0.33	0.33	0.32	0.33	0.30	0.33
G_w	0.42	0.43	0.44	0.43	0.44	0.43
S	0.14	0.12	0.11	0.12	0.09	0.08
SST_O	0.183	0.158	0.144	0.147	0.117	0.104

Table 5.6.2.3: SLID and Census Results Compared – Aboriginal and Non-Aboriginal After –tax 2006

	Aboriginal		Non-Aboriginal	
	Census	**SLID**	**Census**	**SLID**
H	0.28	0.24	0.14	0.14
I	0.41	0.33	0.41	0.36
HI	0.11	0.08	0.06	0.05
HI2	0.07	0.04	0.04	0.03
Mean Income ($)				
of Poor	11,800	13,200	11,400	12,600
G_p	0.33	0.32	0.34	0.36
G_w	0.40	0.38	0.41	0.39
S	0	0.12	0.09	0.06
SST_O	0.198	0.131	0.110	0.067

The census findings show that in five-year intervals before-tax off-reserve Aboriginal H declines more than I. HI and HI2 show a declining trend possibly due to a decline in H. While the G_p does not change much, G_w shows some decline in 2006. S and SST_O also decline. All these trends are also observable in the corresponding SLID datasets for the years 1996, 2001 and 2006 with exception of G_w that shows some increase. For the non-Aboriginal population, almost similar trends are observed for the indices considering before-tax income. The corresponding SLID findings support the trend. It can be seen from the SLID and the census results that poverty in terms of H, HI, HI2, S and SST_O is higher for the Aboriginal population compared to the non-Aboriginal population. I is also a little higher for the Aboriginal population. However, the Gini coefficients are comparable between the Aboriginal and non-Aboriginal groups.

5.7 Discussions and Conclusion

From the results presented above it can be concluded that there has been a major decline in Aboriginal poverty in economic families and unattached individuals by early 2000s measured in terms of H, HI, HI2, S, and SST_O. However, poverty measured in terms of I does not show a particular trend. After the decline, Aboriginal poverty indices remain stable and start to show some decline from the mid 2000s onwards. According to the breakdown of the SST_O Index, the decline in Aboriginal poverty is mainly due to decline in the Headcount Ratio. However, despite the decline, poverty measured by all these indices is considerably higher for the Aboriginal population than it is for the non-Aboriginal population, and the gap in poverty for the two population groups does not show any further sign to converge. After-tax poverty is lower than before-tax poverty for both the population groups. Income inequality among the non-Aboriginal population

remains stable throughout the period whereas Aboriginal income inequality shows a slightly increasing trend in the 2000s. The changes in the indices for the non-Aboriginal population are less pronounced and remain stable most of the times.

In order to see how this study fits into existing literature, some comparisons can be drawn with some of the findings of the literature discussed in chapter 4. But it needs to be kept in mind that the studies differ in terms of unit of analysis (family or individual), definition of income, definition of the Aboriginal population, time period and poverty line. In the discussion below, first we take a look at poverty and then inequality.

Lee (2000) suggested a poverty headcount of about 0.55 for the urban Aboriginal population on the basis of 1996 Census, before-tax individual total income and LICOs, whereas the current research finds the poverty headcount for the off-reserve Aboriginal economic families and unattached individuals (which are mostly urban) to be somewhat lower at 0.50 (Table 5.6.2.1). However, the latter calculation is based on before-tax total income of economic families and unattached individuals. For non-Aboriginal people, the before-tax low income rate according to Lee (2000) was 0.24. The current study finds the same for the non-Aboriginal economic families and unattached individuals (Table 5.6.2.1).

Picot and Myles (2005) look at the incidence of low income and inequality for the whole Canadian population whereas the current research divides the population into Aboriginal and non-Aboriginal groups and then looks at various indices for low income or poverty and inequality for economic families and unattached individuals. As a result the numbers are not directly comparable between the two studies. Furthermore, the unit of analysis,

poverty line and income variables also differ. However, a cursory look at the trends can be somewhat enlightening.

Picot and Myles (2005) suggest that the after-tax low income rate for all persons (similar to the H) declined between late 1970s and late 1990s, with a falling trend in the 1980s, a rising trend until the mid 1990s and a falling trend afterwards till 2002. If we look at the non-Aboriginal before-tax H in the current study (as after-tax information is not available in the Census of 1996 and 2001), the same declining trend is observed in 1996, 2001 and 2006 Census (Table 5.6.2.2). The before and after-tax SLID data from 1996 to 2002 for the non-Aboriginal population support the same trend (Table 5.6.1.1).

Heisz (2007) also looks at low income and inequality for the entire Canadian population without making any distinction between Aboriginal and non-Aboriginal population. Moreover, there are differences in income variables, unit of analysis and poverty lines considered between this study and the current research. So the results are not comparable between the two. Nonetheless, Heisz's (2007) analysis is important in understanding the trends in low income and inequality in Canada and helps in situating the current research. A similar set of observations by Osberg (2008) regarding inequality is discussed later.

Comparison between Heisz (2007) and the current research shows some similarities in trends of the indices. Heisz (2007) finds the after-tax low income rate to be stable for the whole Canadian population between 1996 and 2004. The current study finds the after-tax non-Aboriginal economic family H to be slightly declining between 1996 and 2000 and then stable onwards (Table 5.6.1.1).

NCW (2007) reports the before-tax poverty rate for the off-reserve Aboriginal people living in economic families as 0.31 compared to a poverty rate of 0.12 for the non-Aboriginal population living in economic families in 2001. The current study findings are 0.41 and 0.21 according to census (Table 5.6.2.1 and 2) and 0.30 and 0.20 according to SLID for economic families (5.6.2.1 and 2). Furthermore, NCW (2007) refers to the 2004 SLID data that shows Aboriginal poverty rates were two times more than the non-Aboriginal rates. The current study findings are 0.31 and 0.20 respectively (Table 5.6.1.1). The numbers of the two studies differ possibly due to definition of the income variables, definition of the Aboriginal variable, unit of analysis and exclusion of observations with zero and negative income. The NCW paper does not discuss these points.

Noel and Larocque (2009) provide the low income rates for the provinces as well as for the whole of Canada by using after-tax economic family total income, LICOs and the 2006 Census. The H for the off -reserve Aboriginal people was 0.217 whereas it was 0.111 for the non-Aboriginal people. The current study finds these ratios as 0.28 and 0.14 for economic families and unattached individuals (Table 5.6.2.3). The differences could be due to definition of Aboriginal population, unit of analysis and exclusion of observations with zero and negative income by the current study.

Drost and Richards (2003) show that the Gini Coefficient (G_w) for the on-reserve Aboriginal population, based on before-tax individual total income, first increased from 0.48 to 0.53 between 1985 and 1990, and then decreased a little to 0.52 in 1995. For the off-reserve Aboriginal population, the coefficient declined from 0.48 to 0.47 and then went up to 0.51. For the non-Aboriginal people, the numbers were 0.46, 0.44, and 0.47.

The current research, on the basis of the 1996 Census, finds the G_w for the off-reserve Aboriginal and non-Aboriginal economic families and unattached individuals on the basis of before-tax family total income to be 0.46 and 0.42 respectively (Table 5.6.2.1 and 5.6.2.2). From 1996 onwards, the coefficient shows a slightly declining trend for the off-reserve Aboriginal population and a slightly increasing trend for the non-Aboriginal population. Since Drost and Richards (2003) calculated the G_w on the basis of before-tax individual income and the current research looks at before-tax economic family and unattached individual income, the coefficient values are not directly comparable, yet it is interesting to take note of the proximity of the two sets of numbers

According to Picot and Myles (2005), the after-tax G_w for the Canadian families remained almost unchanged between late 1970s and late 1990s, and both before- and after-tax G_w increased by six per cent between 1990 and 2000 according to survey (SLID) data. Between these two years, the before-tax G_w increased by five per cent according to census data. If we look at the non-Aboriginal before-tax G_w in the current study (Table 5.6.2.2), this increasing trend is captured by the 1996, 2001 and 2006 Census as well, though the increase is quite modest. The SLID dataset also captures the increasing trend to some extent. The before and after-tax G_w increased between 1996 and 2001, and then dropped in 2006 to a level the same as or a little higher than the 2001 level (Table 5.6.1.7).

According to the current research, the after-tax G_w for non-Aboriginal economic families and unattached individuals remained stable between 1996 and 2007 (Table 5.6.1.7), whereas Heisz (2007) finds the after-tax G_w for the whole population to show a slightly

increasing trend from the mid to the late 1990s and then an otherwise stable trend at a higher level in the 2000s.

In comparison to findings of Osberg (2008) regarding the G_w, the current study finds a similar pattern in the coefficient from the mid-1990s onwards. The G_w for after-tax economic family income for the non-Aboriginal population appeared to be stable, ranging between 0.38 and 0.41 in 1996-2007 and becoming stable at 0.39 from 2002 onwards (Table 5.6.1.7). Osberg (2008), on the other hand, finds that the coefficient did not change much in the mid to late 1980s, increased in the early to mid 1990s, and then again became moderately stable from the late 1990s onwards at a higher level, hovering around 0.43. The G_w values of the two studies are not exactly comparable as the numbers given by Osberg (2008) are for the whole population and the current research divides the population into two groups – Aboriginal and non-Aboriginal. The higher G_w of the former study could be due to inclusion of Aboriginal people in the whole population.

As it has been stated above, comparison of the studies in terms of the numerical results is difficult due to differences in unit of analysis, definition of income variable, definition of the Aboriginal variable, time period and poverty line. However, the trends that are observed in low income or poverty rate (Headcount Ratio H) and Gini Coefficient (G_w) give a somewhat comparable pattern of poverty and inequality for the studies discussed. The declining trend in overall poverty, and moderately increasing to somewhat stable trend in overall inequality suggested by the previous studies and summarized in chapter 4 are also captured by this research.

An aspect that can be explored in connection to this research is the contribution of different Aboriginal identity groups to the changes in poverty and income inequality indices. For example, there has been a dramatic growth in the Métis population over the period 1996-2006 as mentioned in chapter 4. The possible reasons are increased self-reporting by the Métis population and high fertility. With the knowledge that income of the Métis population is higher than that of the rest of the Aboriginal population and comparable to that of the non-Aboriginal population, it can be checked if the growth of the Métis population had any effect on the changes in the poverty and inequality indices for the period 1996-2007.

However, to be able to do so, a major problem arises with the SLID data where segregation of different Aboriginal identity groups is not possible at this point. Though census data provide such segregated information, the five-year interval may not be as enlightening as the SLID annual data. Furthermore, the census does not have the advantage of tracking the same households for a number of years like the SLID. Using customized data of Statistics Canada, it would possibly be easier to explore the influence of different Aboriginal identity groups on the poverty and income inequality indices.

The author took a preliminary look at this aspect of the research. For Aboriginal counts the variable *abortg15* in the SLID is used in this research. This variable is a combination of two other variables – registered/treaty Indian and Aboriginal background. The difference between the total counts of the *abortg15* variable and the registered/ treaty Indian variable is considered a proxy for the Métis population. The computed numbers suggest that though there has been a growth in the total Aboriginal population, the share of the Métis population showed a decline along with decline in poor and non-poor Métis

population between 1996 and 2006. On the other hand, the share of the registered/ treaty Indian, and the poor and non-poor Indian increased between the same period. Keeping the limitation of the proxy in mind, it is highly unlikely that a shift in the composition of the Aboriginal population explains our findings on the reduction in poverty.

Another aspect worth considering in connection to this research is the significance of changes of the poverty and income inequality indices. Though the studies discussed in chapter 4 report various poverty and income inequality indices and their changes from year to year, none of them discuss the statistical and non-statistical significance of these changes or how to interpret the changes from year to year. One possible way to address this problem is to create the confidence interval for an index for each year and then compare the confidence intervals for all the years to determine the significance of change from year to year. To find the confidence intervals bootstrapping is recommended.[9] An aspect related to testing the significance of change in the Gini Coefficient is to see whether the change in the coefficient is driven by the changes in the middle ranges of the income distribution or not, since the Gini Coefficient is sensitive to changes in the middle ranges of the income distribution. Time constraints did not allow this study to go in these directions.

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[9] Details of the procedure regarding significance of changes in the Gini Coefficient is given by Escudero and Gasparini (2000)

CHAPTER 6

CONCLUSION

This research is motivated by a lack of measurement and consistent tracking of Aboriginal poverty and income inequality in Canada over a long period of time. Because of unavailability of data, the research looks at only off-reserve Aboriginal poverty and income inequality for the period 1996-2007 excluding the northern territories. The research measures poverty with six different indices - the Headcount Ratio (H), the Income Gap Ratio (I), the Poverty Gap Index (HI), the Sen Index (S), the Sen-Shorrocks-Thon Index (SST_O) and the Foster − Greer − Thorbecke Index (FGT), and income inequality with the Gini Coefficient (G). The indices are calculated for economic families and unattached individuals considering both before and after-tax incomes. Low income cut-offs (LICOs) are used as poverty lines to identify the poor. All necessary data are gathered from the Census of 1996, 2001, and 2006 and the Survey of Labour and Income Dynamics (SLID) of 1996-2007.

Along with off-reserve Aboriginal poverty and income inequality, non-Aboriginal poverty and income inequality are measured and compared with off-reserve Aboriginal poverty and income inequality. The findings are also compared with findings of previous studies.

The research finds that there has been a major decline in off-reserve Aboriginal poverty by early 2000s captured by the indices. After the decline, off-reserve Aboriginal poverty indices remain stable and show some decline from mid-2000s onwards. According to the breakdown of the SST_O Index, the decline in off-reserve Aboriginal poverty is mainly

due to decline in the headcount ratio. However, despite the decline, poverty measured by all these indices is considerably higher for the off-reserve Aboriginal population than it is for the non-Aboriginal population, and the gap in poverty for the two population groups does not show any further indication to converge. Income inequality among the non-Aboriginal population remains stable throughout the period whereas off-reserve Aboriginal income inequality shows a slightly increasing trend in the 2000s.

These research findings are compared with those of the existing literature. Direct comparison of the studies in terms of numerical results is difficult due to differences in the units of analysis, and differences in the definition of the income variable, the Aboriginal variable, the time periods and poverty lines chosen. However, the trends that are observed in the headcount of poverty and income inequality give a somewhat comparable pattern of poverty and income inequality for the studies discussed. The declining trend in overall poverty and moderately increasing to somewhat stable trend in overall income inequality suggested by the previous studies are also found by this research.

There are a few limitations of the research that need to be taken into account while interpreting the results. First, two datasets are used in this research – the census and the SLID. The identification of the Aboriginal population is different between these two datasets as explained in chapter 3. In the census, the variable ABDERR summarizes the response of the respondents regarding identity, not ancestry. Identity can be any one or more of these: North American Indian, Métis, Inuit, Treaty or Registered Indian and Band member. On the other hand, the variable abortg15 in the SLID summarizes responses regarding Aboriginal ancestry and Treaty or Registered Indian identity. As a

result the Aboriginal counts are not the same between these two datasets. This point needs to be kept in mind while comparing the census and the SLID results as well as interpreting the results and the changes derived from each dataset.

Second, as the LICOs are not defined for reserves and Yukon, Northwest Territories and Nunavut, only the off-reserve Aboriginal population of the ten provinces are considered in this research. So the poverty and the inequality measurements of this research provide only a partial picture. Furthermore, by focusing only on income, these LICOs do not address any peculiarities in spending patterns of the off-reserve Aboriginal population.

Third, in the 1996 Census data, there is no variable to identify the off-reserve Aboriginal population. An indirect method, described in chapter 3, has been used to identify the off-reserve Aboriginal population. So the off-reserve Aboriginal count for 1996 could be slightly off from the actual count having some impact on the findings.

This research can be extended in many important directions in the future. As this study deals with the time period 1996-2007, it can be extended beyond 2007 as and when data become available for more recent years. The study is done for whole of Canada (excluding Yukon, Northwest Territories and Nunavut) but can be replicated for each province. Depending on availability of data an attempt can be made to measure poverty and income inequality for the on-reserve Aboriginal population of the provinces as well as for those of the northern territories. In this case two major challenges would be to define the LICOs and gather adequate income information. This study uses only one poverty line LICO to identify poverty. Other poverty lines such as the Low Income Measures (LIMs) and the Market Basket Measures (MBMs) can be used side by side to

see if poverty measurements change considerably with the change in the poverty lines. As it is observed in chapter 5, the headcount ratio is dominating the fall in poverty for the off-reserve Aboriginal population. This aspect needs to be explored further. Issues related to the possible influence of the composition of the Aboriginal population on the poverty and income inequality indices and the significance of changes in these indices, discussed in chapter 5, are worth mentioning here as well. A further step would be to see how different variables such as economic growth, education and transfers affect poverty and income inequality.

This research is an attempt to present a profile of the off-reserve Aboriginal poverty and income inequality in Canada for a period of twelve years because such a profile has been absent from the mainstream Canadian poverty discussions. In order to create the profile, some well-known and some sophisticated indices for poverty and income inequality are used for the first time to see if the measurements differ from index to index. There are discrepancies in defining the off-reserve Aboriginal population in the government datasets. So looking at just one dataset may not be sufficient to get the full picture of Aboriginal poverty and income inequality. Two datasets, namely the SLID and the census, are used to see if similar trends are observed using these datasets.

All this is done with the hope that future researchers and policy makers will have a solid reference point for their work. They would know what happened to off-reserve Aboriginal poverty and income inequality between 1996 and 2007, how different indices and datasets produced similar results, and how Aboriginal and non-aboriginal poverty and income inequality compared. Such knowledge based on up-to-date poverty and income inequality measurement tools will go a long way in helping understand the

history of Aboriginal poverty and income inequality, projecting the poverty and income inequality scenario for the future and designing poverty alleviation and income distribution policies and strategies for the off-reserve Aboriginal population of Canada. Such policy oriented recommendations would need to build on the research in this thesis by examining the causes of recent trends in poverty reduction and the reasons why off-reserve poverty still remains so high.

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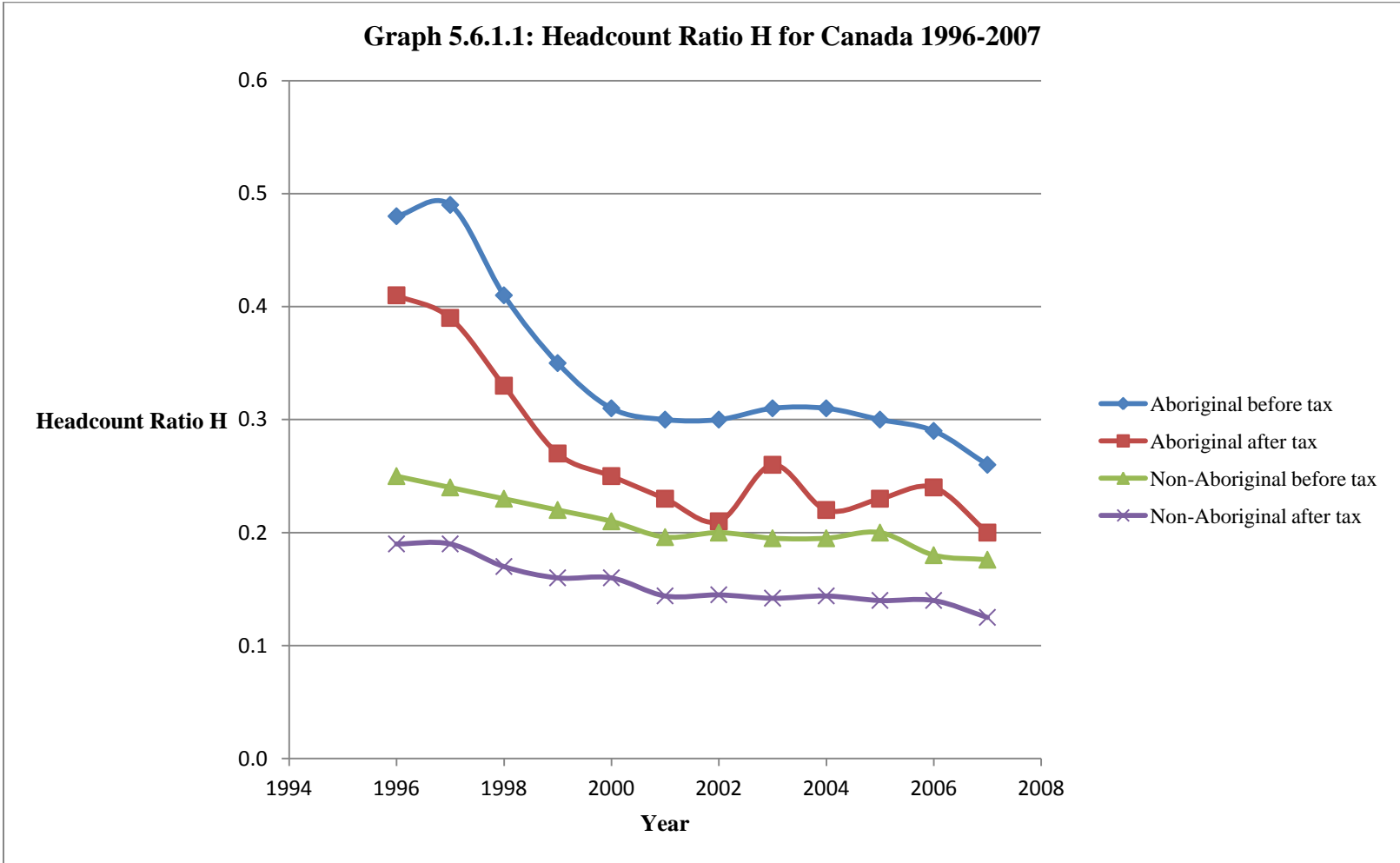Zheng, B. (1997). Aggregate poverty measures. *Journal of Economic Surveys, 11*(2), 123-62.
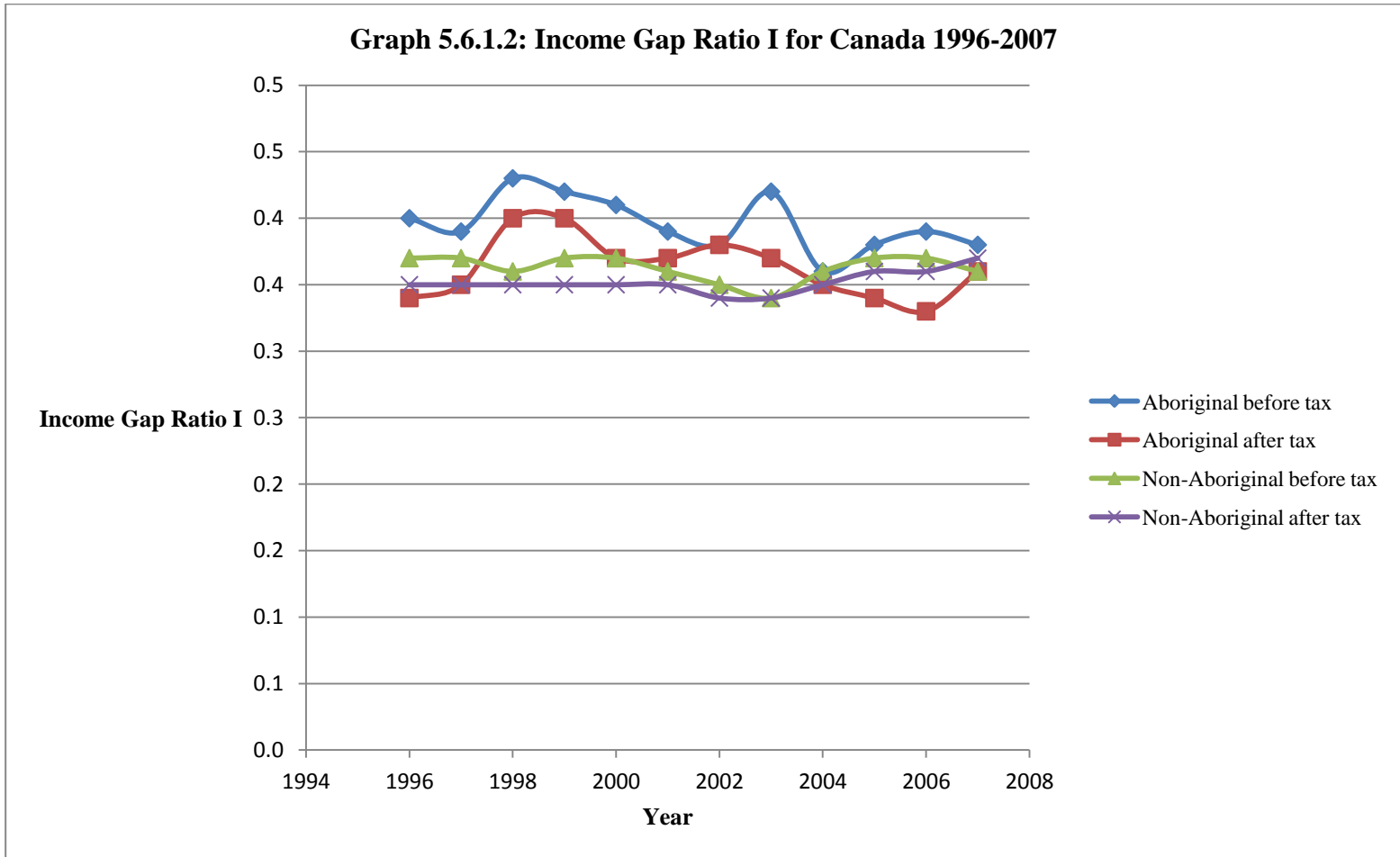
APPENDIX

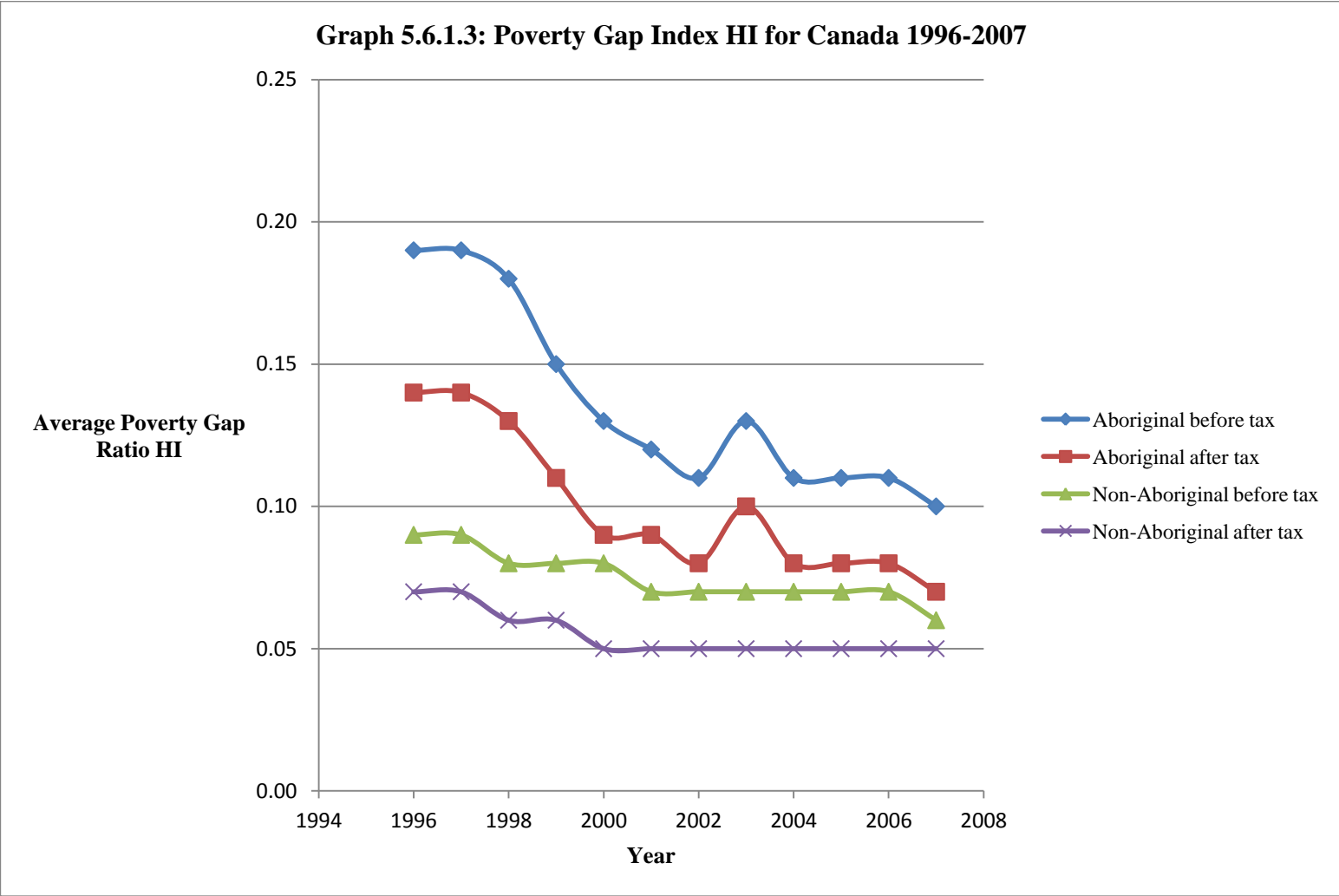**Table 1: 2007 Low Income Cut-offs (LICOs) before tax – 1992 base**

Community size

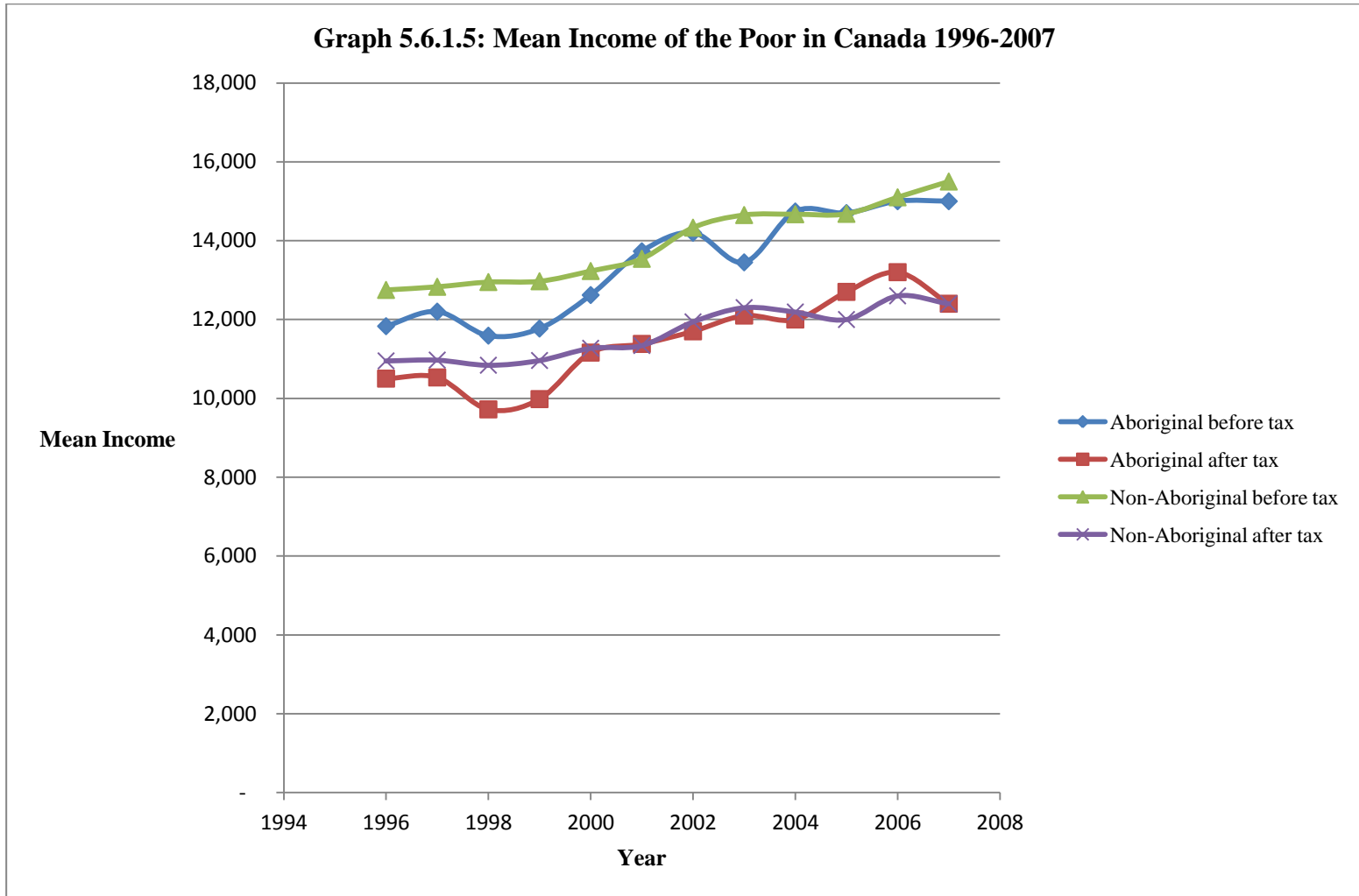|	**Rural areas**	**Urban areas**			
		Less than 30,000[10]	**30,000 to 99,999**	**100,000 to 499,999**	**500,000 and over**
Size of family unit		Dollars			
1 person	14,914	16,968	18,544	18,659	21,666
2 persons	18,567	21,123	23,084	23,228	26,972
3 persons	22,826	26,968	28,379	28,556	33,156
4 persons	27,714	31,259	34,457	34,671	40,259
5 persons	31,432	35,760	39,081	39,322	45,662
6 persons	35,452	40,331	44,077	44,350	51,498
7 persons or more	39,470	44,903	49,073	49,377	57,336

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[10] Includes cities with a population between 15,000 and 30,000 and small urban areas (under 15,000).

Graph 5.6.1.1: Headcount Ratio H for Canada 1996-2007

Graph 5.6.1.2: Income Gap Ratio I for Canada 1996-2007

Graph 5.6.1.3: Poverty Gap Index HI for Canada 1996-2007

Graph 5.6.1.4: Squared Poverty Gap HI2 for Canada 1996-2007

Mean Income

Graph 5.6.1.5: Mean Income of the Poor in Canada 1996-2007

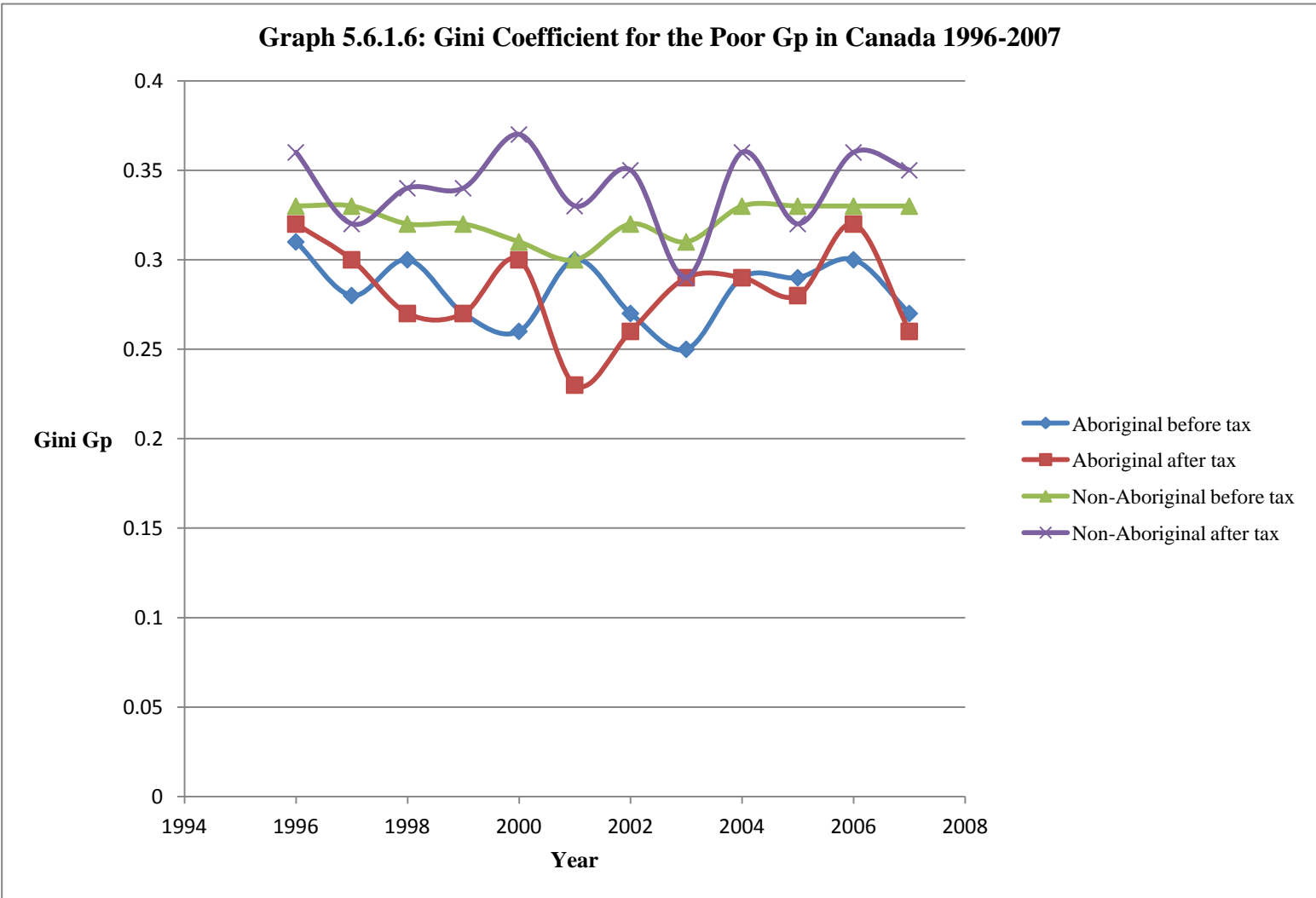Graph 5.6.1.6: Gini Coefficient for the Poor Gp in Canada 1996-2007
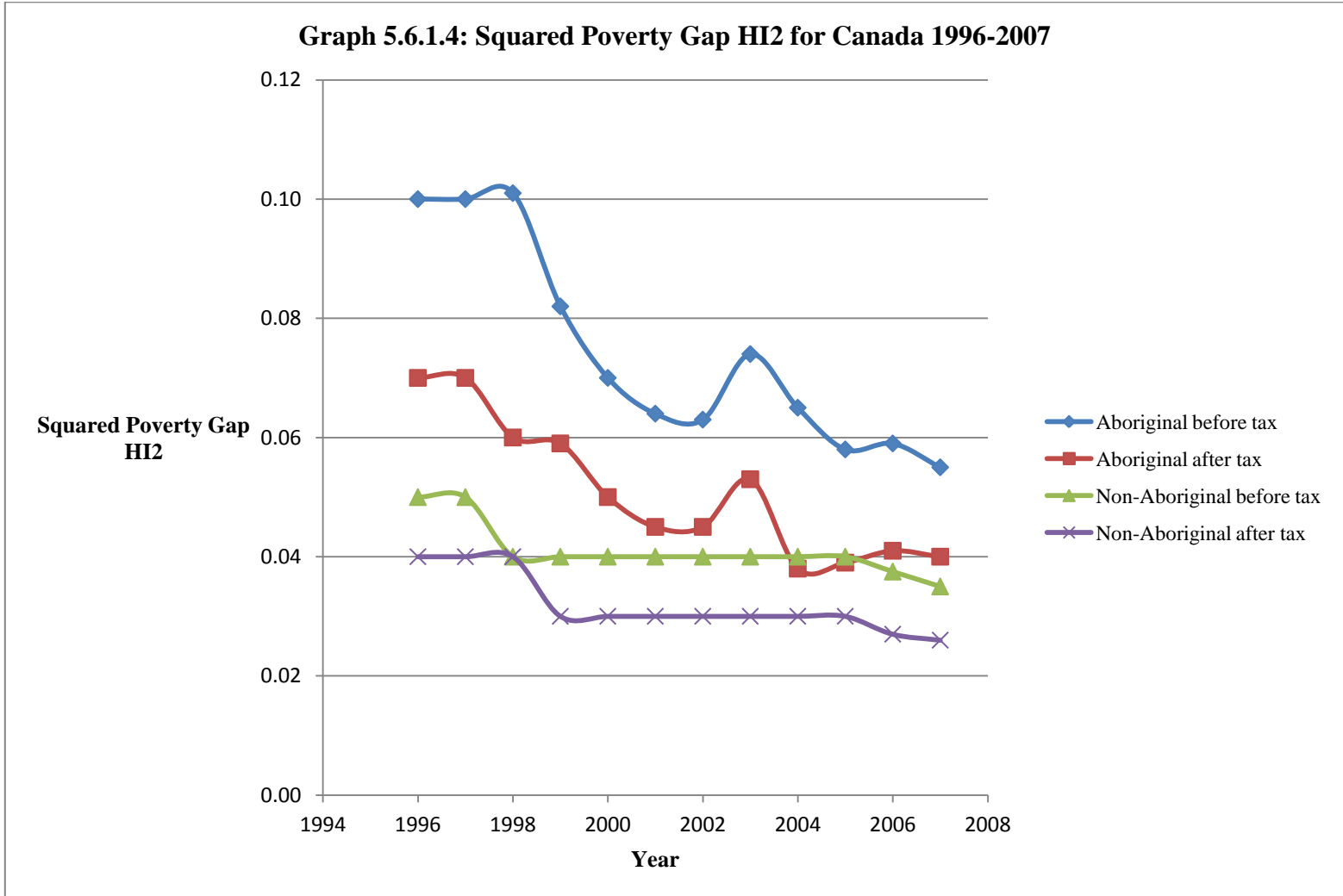
Graph 5.6.1.7: Gini Coefficient for the Whole Population Gw in Canada 1996-2007

Graph 5.6.1.8: Sen Index S for Canada 1996-2007