

## CAUGHT IN THE MIDDLE: SOME IN CANADA'S MIDDLE CLASS ARE DOING WELL; OTHERS HAVE GOOD REASON TO WORRY

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### SUMMARY

It is sometimes difficult to tell which group is more distressed about the purportedly deteriorating well-being of Canada's middle class: Politicians courting middle-class voters, or the Canadians who actually identify as middle class. Even more difficult to discern is whether either group truly understands precisely who it is they are worrying about. There is no firm consensus on where the upper and lower boundaries of the middle class lie, with economists and statisticians disagreeing on the income levels and brackets that should be included in the definition of middle class, and some even arguing that income itself may be an inappropriate measure (preferring instead, for instance, consumption and lifestyle).

And yet, despite all the conflicting approaches to measuring the middle class, what emerges from a review of the array of definitions and data sources is that the politicians and voters can at least partly justify their angst. While the middle class has seen its income grow, it has not kept pace with the income growth rate of higher-earning groups. But not all members of the so-called middle class face the same plight. The workers who have lost the most ground relative to higher-income groups, are those with below-average human capital (that is, lower skill and education), and are at the lower end of the middle-income bracket. The largest source of downward pressure on middle-class incomes has been the decline of Canada's manufacturing industry. Beginning in the postwar years, factory jobs developed a misplaced reputation for being well-paying middle-class work. In fact, the work provided generous pay and benefits only relative to the low human capital that was necessary to find employment in manufacturing. As manufacturing has declined across all industrialized countries, lower-skilled workers have been forced to accept lower rates of income growth.

Meanwhile, more gains have been made by those with high levels of human capital. Public-sector professionals in particular have come to share the human-capital and income characteristics of Canada's highest-paid managers and professionals, often enjoying greater job security as well. In reality, anxiety over the state of the middle class and its future is actually about the working class. Lumping middle-class factory workers and clerical assistants in with middle-class teachers and nurses — as current political discussion tends to do — obscures the truth about which members of that group are genuinely struggling to keep up. As long as politicians continue to promote policies aimed at helping everyone within such a vague and broad target group, they can only end up misdirecting resources by enriching those who are already doing reasonably well, rather than focusing on those working-class Canadians who truly are not.

Already net transfers through the tax system to middle-income groups have grown markedly. These transfers have managed to offset about half the erosion of middle-class incomes in the marketplace. Those transfers have been financed through increased tax payments from high-income groups, but also through shrinking transfers to low-income groups. These developments raise serious policy issues for which there are no simple answers. The breadth of Canada's middle class obviously means that it encompasses the largest proportion of families, by far. Any further policies aimed at transferring wealth from other income groups to appease middle-class voters will be costly. Given that the main cause for concern is the worsening situation of lower-skilled workers, politicians who truly want to help those struggling in the "middle class," should focus their efforts on helping Canadians acquire more education and more skills.

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## 1. INTRODUCTION

How the middle class is faring has become a focal point in the public debate about the economy. Since most people self-identify as belonging to the middle class, claims that the middle class is struggling provoke widespread anxiety. Because the middle class is so numerous, it is heavily courted by politicians, who press policy-makers to find ways to support it in its perceived struggles. Policy-makers in turn may target too wide a swathe of the middle class if they do not carefully identify which parts need support and why.

This paper discusses how complex is the seemingly simple task of identifying the middle class and determining whether its condition is improving or deteriorating. This is because many variables determine middle-class status, ranging from income and wealth to consumption, with often contradictory results. This is not how the public debate is framed. Nor are all segments of the middle class trending in the same direction, which is hardly surprising given the wide range of people it covers.

As well, the answer also depends on whether one discusses middle-class outcomes in absolute or relative terms. In absolute terms, most middle-class outcomes, for a variety of the constructs of middle class, are continuing to improve, but not as rapidly as they are for high-income earners. It is unclear how to interpret the inability of many middle-class people to keep up with the growth of high-income earners, a phenomenon seen in many countries.

Finally, if claims that the middle class is struggling in absolute terms are false, then the attention devoted to helping it could divert resources from lower-income groups that may need more help, which has actually happened over the past three decades.<sup>1</sup>

The paper begins with a conceptual review of what is meant by “middle class” to guide its practical definition. Wherever possible, we begin with theoretical reasons why a particular variable is representative of middle-class outcomes and then proceed to review whether statistics exist to measure these variables and what they reveal. We begin with income, but it is not the only measure of inequality in our society. Even the best income data leave out important resources such as in-kind benefits and intra-family transfers. The imperfect nature of income data is a good reason to at least consider other measures of middle-class status, such as wealth, consumption, and even self-identification. Ultimately, what we want to measure is the distribution of the ability to control resources that will generate consumption or saving, the latter to be invested in generating more financial or human capital.

There are many ways of defining and measuring the middle class. Different results will depend on whether individual or household circumstances are examined, or whether income is measured before or after the tax and transfer system redistributes incomes. The time period is important, as the largest erosion of segments of middle-class income happened years ago and people move between income classes over time. There will always be an element of arbitrariness in drawing lines on the continuum of the distribution of income (or wealth or consumption) to mark class status. While the question of how the middle class is faring is complex, and there is not a unique way to correctly portray it, the intent of this paper is to help readers appreciate this complexity and to draw some overall conclusions about trends and policies.

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<sup>1</sup> Even this prospective policy has to be handled carefully—redistribution from the upper-income to the lower-income class can trap low-income people behind a welfare wall if done improperly, which only perpetuates low-income status. There is evidence this is already happening among some low-income groups, such as the disabled, because of bad public policy. See Frances Lankin and Munir Sheikh, *Brighter Prospects: Transforming Social Assistance in Ontario: A Report to the Minister of Community and Social Services* (Government of Ontario, 2012).

## 2. WHAT DEFINES THE MIDDLE CLASS?

Despite acknowledging the importance of class, there is nothing remotely approaching a consensus on what constitutes the middle class (or the “middling sort,” as it was called until the 19th century).<sup>2</sup> There is not even agreement on whether class can be measured in economic terms. Franks says that “class is a question of values and taste” not money, birth or occupation as “It is primarily a matter of authenticity... Class is about what one drives and where one shops and how one pays, and only secondarily about the work one does or the income one makes.”<sup>3</sup> Robert Fogel advocates analyzing biomedical measures such as status, body mass index and life expectancy, in addition to economic variables to measure how living standards have improved over time.<sup>4</sup>

Given the daunting task of trying to define class, and especially the middle class, in a way that can be measured, economists and sociologists have offered a wide range of definitions. Carnes argues that “the dividing line between social classes in most societies revolves around the labour market, that is, how people earn a living.”<sup>5</sup> While noting there are many manifestations of class differences, he argues that the fundamental determinant is how people earn a living, more than it is how much they earn. This is because “income groups have no common organizational anchor” but occupations do. Income fluctuates over time, but a person’s occupation varies much less. When we meet people, we ask “What do you do for a living?” not “How much do you earn?” or “What’s your highest educational degree?”<sup>6</sup> In this view, the occupational structure of work, and not income or wealth, is what defines class. This comes out in how many people used to distinguish between the middle class and the working class.<sup>7</sup> Indeed, the modern usage of the term “middle class” began in Britain to distinguish the group of professionals, managers and senior civil servants who fell between the upper class and the working class. The defining characteristic of this conception of the middle class was working in occupations that required significant human capital. This leads to a definition of middle class based on human capital, since middle-class societies originate in universal education.<sup>8</sup>

There are a number of other approaches to defining the middle class. One is to ask people to self-identify with a class. Another is to define middle class in terms of possessions or a certain lifestyle, focusing on consumption and not income as the key economic variable. Some definitions involve intergenerational comparisons of whether living standards are improving for each age cohort. Finally, there are myriad definitions of the middle class in terms of income. These range from deviations from the median income to select percentiles of the income distribution to specific levels of income.<sup>9</sup> The inevitably arbitrary nature of these definitions does not mean they are not valid or useful. The approach in this paper is to look at all these measures and weigh their usefulness and the preponderance of evidence. We begin with measures of income, which are most commonly used as a metric of class.

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<sup>2</sup> John Steele Gordon, *An Empire of Wealth* (New York: HarperCollins, 2004), 51.

<sup>3</sup> Quoted in Paul Saurette and Shane Gunster, “Canada’s Conservative Ideological Infrastructure,” in *Tax Is Not a Four-Letter Word*, ed. Alex Himelfarb and Jordan Himelfarb (Waterloo, Ont.: Wilfrid Laurier University Press, 2013), 238.

<sup>4</sup> Robert Fogel, *The Fourth Great Awakening and the Future of Egalitarianism* (Chicago: The University of Chicago Press, 2000), 159.

<sup>5</sup> Nicholas Carnes, *White Collar Government: The Hidden Role of Class in Economic Policy Making* (Chicago: The University of Chicago Press), 3.

<sup>6</sup> *ibid.*, 19.

<sup>7</sup> This does not even address non-economic definitions of class. Hegel, for example, argued that primitive society was divided into classes based on one’s attitude towards violent death, and a warrior ethos based on the willingness to risk death “remained the essential core of the culture of aristocratic societies the world over.” Francis Fukuyama, *The End of History and the Last Man* (New York: Avon Books, 1992), 148.

<sup>8</sup> Fukuyama, *The End*, 116.

<sup>9</sup> An even broader consideration beyond income and consumption is utility, which adjusts for the increased consumption of leisure by family members not in the labour force and the reduced consumption of leisure for those who are working.

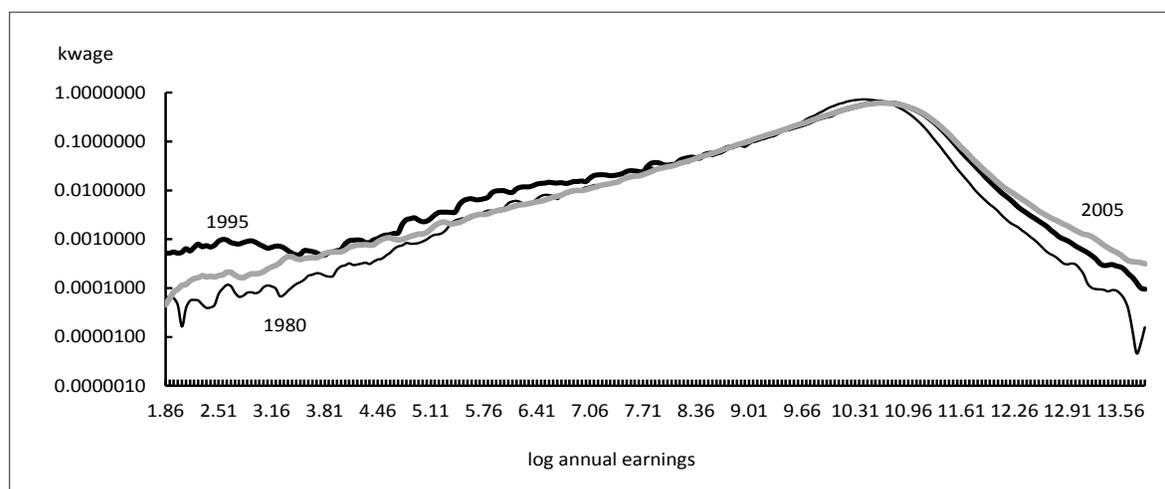
### 3. AN OVERVIEW OF THE DISTRIBUTION OF INCOME

Writing in 1987, Blackburn and Bloom noted that studies of changes in the distribution of income are often contradictory because of “a remarkably wide range of conventions of data analysis.”<sup>10</sup> Different researchers use different time periods, myriad ways of defining the population studied, different ways of defining the family unit (individuals, family or equivalent family income, etc.), a wide range of definitions of earnings and income, and different units of time to measure earnings (hourly, weekly or annual), to name a few. The range of measures used today remains quite broad, which often produces different results.

Compounding the problem is that defining what is a middle-class income is always arbitrary, necessarily so because the distribution of income is a continuum and “there is never a discontinuous break between social classes.”<sup>11</sup> Defining classes is inevitably an exercise in drawing arbitrary lines on this continuum. Moreover, demarcating lines between classes ignores the substantial movement over time among income groups. A person being in a particular income group or class in one year is no guarantee the same person will be in the same group in future years.

Figure 1 shows how Canada’s overall distribution of income has changed over time. It uses census data on family incomes, and shows the density of income earners for each level of annual earnings adjusted for inflation.<sup>12</sup> Between 1980 and 2005, the most notable changes were at the lowest and highest level of earnings—an increase in the number of people earning both high and low incomes. The increase in high-income earners was constant over the whole period, while the increase in low-income earners occurred between 1980 and 1995, and was then partly reversed over the next decade. The implication is that there was apparently some erosion of the share of people earning middle-class incomes, mostly those with below-average incomes, about equally due to gains in high- and low-income earners. However, this is impressionistic, as we have not yet tried to rigorously define what income groups are included in the middle class.

**FIGURE 1 DENSITY VALUES**



<sup>10</sup> McKinley Blackburn and David Bloom, “Earnings and Income Inequality in the United States,” *Population and Development Review* 13, 4 (December 1987): 603.

<sup>11</sup> Thomas Piketty, *Capital in the Twenty-First Century* (Cambridge, Mass.: Harvard University Press, 2014), 252.

<sup>12</sup> This graph is a fuller version of Figure 1 in Tammy Schirle, René Morissette and Yuqian Lu, “The Growth of Family Earnings Inequality in Canada, 1980-2005,” *Review of Income and Wealth* 57, 1 (March 2011).

Figure 1 highlights the first choice that has to be made, that of whether to use incomes for the family or the individual. Both are useful. Individual income more closely approximates the direction in which market forces are pushing income, but family income is closer to the standard of living people actually experience. However, family income is also affected by changes in family structure and size as well as economic forces. The trend to assortative mating, especially among upper-income earners, affected the distribution of family income before 1995.<sup>13</sup> Conversely, the growing number of single-parent families boosted the number of people in low income in the 1980s and 1990s. Overall, Heisz found that changes in family structure were the leading cause of changes in the distribution of family income between 1976 and 2004, while market-driven changes in individual incomes had little impact.<sup>14</sup> Most studies of inequality assume an equal distribution of resources within the family. However, more recent research suggests that is not the case, especially with men who keep a preponderance of extra income they earn.<sup>15</sup>

#### 4. DEFINING MIDDLE-CLASS INCOME

Given this overview of the distribution of incomes in Canada, where do we draw the lines for the middle class? There are three basic approaches to specifying the range of incomes for people included in the middle class. One is to select a deviation of incomes from the median. Another is to include all people between certain percentiles to capture the middle portion of incomes, usually the 60 per cent of the population that falls between the 20th and the 80th percentile. Finally, some researchers dispense with any attempt to camouflage the inherent arbitrariness of both these approaches and simply pick income ranges based on a largely subjective idea of what income is needed to support a middle-class lifestyle in Canada. All of these approaches involve subjective judgments and yield different results.

Middle class does not have to mean a middling income. For Piketty, although those in the middle class “dispose of resources considerably above average for the society in question, they nevertheless retain a certain proximity to the average.”<sup>16</sup> This is why he defines middle class as the first 40 per cent of people above the average; they “are doing distinctly better than the bulk of the population yet still a long way from the true ‘elite.’”<sup>17</sup> In this view, middle class is definitely not the middle of the distribution. However, he admits he could have just as easily divided the population into thirds.

The usual approach to the question of what defines middle-class income is to calculate the median income, and then select a range around it.<sup>18</sup> By abstracting from absolute levels of income, using a range around the median introduces the expectation that income growth should move with the economy’s average over time. This allows middle-class incomes to fluctuate with economic conditions, which is

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<sup>13</sup> Schirle finds that this impact becomes negligible after 1995 as more women married men with less education. Schirle, Morissette and Lu, “The Growth,” 36.

<sup>14</sup> Andrew Heisz, “Income Inequality and Redistribution in Canada: 1976 to 2004,” Statistics Canada Catalogue 11F0019MIE, 298 (2007), 27.

<sup>15</sup> Therefore, the gains in income earned by women in recent decades have reduced intra-family inequality. In the U.K., this reduction offset all of the increase in market inequality of incomes. Pierre-Andre Chiappori and Costas Meghir, “Intrahousehold Inequality,” Cowles Foundation Discussion Paper No. 1948 (Yale University, May 2014).

<sup>16</sup> Piketty, *Capital in*, 251.

<sup>17</sup> *ibid.*

<sup>18</sup> Leonhardt and Quealy have used median income as an indicator for the middle class (David Leonhardt and Kevin Quealy, “The American Middle Class Is No Longer the World’s Richest,” *The New York Times*, April 22, 2014). Using this definition, they argue that Canada has done much better than the U.S. over the 2000 to 2010 period in the growth of middle-class incomes. This is consistent with analysis showing the decline of the middle class in Canada over this period: middle-class incomes have declined in relative terms in many countries over time, but the decline in relative terms is somewhat less in Canada than in the U.S.

closer to what most questions about the middle class seek to answer.<sup>19</sup> One problem with deviations from the median is that, because there is no right or wrong answer about the size of the deviation, researchers are free to select whatever range they want. The risk is that the range is selected to produce the results that the researcher wants to get, a real concern when dealing with the politically charged debate of how the middle class is faring.

And the range of incomes used to define the middle class is quite diverse. Thurow used a range of incomes 25 per cent above and below the median as the middle class; Beach used a range of 50 per cent around the median. Researchers using a definition of class based on income quintiles (such as the middle three quintiles) are implicitly favouring a range of 30 per cent on either side of the average. Nor does the deviation from the median have to be symmetric; Blackburn and Bloom preferred a definition of between 60 and 225 per cent of the median.<sup>20</sup> Statistics Canada used a range of both 75 to 150 per cent and 66 to 225 per cent of the median, although no rationale was offered for the selection of these specific definitions of the middle class.<sup>21</sup>

Another drawback to defining middle class as a range around the median is that it may lead to thresholds of middle income that violate commonly held perceptions of what is middle class: in Beach's definition, for example, the threshold for some earners is near Statistics Canada's low-income cut-off (LICO), depending on whether they live in a large city or rural areas. Of course, this may simply reflect that commonly held perceptions frequently are incorrect, or that LICOs, measures of relative income, are a poor guide to the absolute level of income needed to qualify as middle class.

As mentioned, a good example of using a range around the median in Canada is from Beach, who defines the middle class as earning between 50 and 150 per cent of median earnings. This produces a middle-class income spectrum of between \$14,500 and \$43,500 in constant 2005 dollars.<sup>22</sup> One implication is that, to attain middle-class status by this definition, all an individual needs to do is to hold a job at Canada's average minimum wage of \$10 an hour<sup>23</sup> for 35 hours a week for a year (which would result in an income of \$18,200). As noted by Charles Murray, not earning enough income to escape the lower class is "failing to pass a low bar."<sup>24</sup> Statistics Canada, using a higher threshold for middle-class income, concluded that between 1976 and 2004 the middle class in Canada posted a "modest" decline in its share of the population of less than four percentage points, with shifts to both higher and lower incomes.<sup>25</sup>

A second approach to specifying middle-class income is to select a segment of the income distribution (the middle 20 per cent or 60 per cent, for example) and then seeing what incomes span this range. In 2011, the income range spanned by the middle three quintiles was between \$25,170 and \$87,500 for all census families. A close variant is to use quartiles.

While using percentiles in the income distribution has the advantage of ease of measurement, in theory there is no justification for defining the middle class as everyone earning less than the top 20 per cent of earners and more than the bottom 20 per cent of income earners. As well, it guarantees that the middle class is always 60 per cent of the population; its size cannot grow or shrink, although its income can

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<sup>19</sup> One problem with this approach is this very emphasis on relative incomes; during a recession, one can sustain a marked drop in income, but still remain within 25 per cent of the median if median incomes fall by the same amount. This hardly seems a good gauge when answering how middle-class outcomes are faring at a time of very weak income growth following the 2008–09 recession.

<sup>20</sup> Blackburn and Bloom, "Earnings and," 579.

<sup>21</sup> Heisz, "Income Inequality," 21.

<sup>22</sup> Charles Beach and George Slotsve, "Are We Becoming Two Societies?" (Toronto: C.D. Howe Institute, 1996), 71.

<sup>23</sup> Statistics Canada, *The Daily*, July 16, 2014.

<sup>24</sup> Charles Murray, *Coming Apart* (New York: Crown Forum, 2012), 227.

<sup>25</sup> Heisz, "Income Inequality," 21. The data are after taxes and transfers.

fluctuate. So instead of focusing on the share of the population that is middle class, the focus becomes changes in its income in absolute terms.

Beach defines the middle class as those falling within the 20th and 80th percentiles of the income distribution. He finds some erosion of the middle class, attributable in almost equal measure to growth both in people earning higher and lower incomes. This result is important, as the public concern about a shrinking middle class is based on the assumption that it is sliding back into the lower class, not that it is shrinking because many members are moving up to escape middle incomes.

Many researchers use the Survey of Labour and Income Dynamics (SLID) data already packaged into quintiles by Statistics Canada, which offers ease of calculation even if using quintiles is arbitrary. The most conventional measure is to use the three middle-income quintiles, a practice Statistics Canada often uses. Using census data for quartiles, Frenette, Green and Milligan found that after-tax incomes fell 8.7 per cent between 1980 and 2000 for the 25th percentile, while they rose 8.0 per cent for the 50th and 15.0 per cent for the 75th percentile.<sup>26</sup> These results also point to a squeeze on members of the middle class with below-average incomes.

A third approach to defining the middle class essentially asserts a certain range of absolute incomes, usually without justifying it as a specific deviation from the mean or as a slice of the income distribution. One possible conceptual justification for using fixed income levels would be offered by determining the possessions a typical middle-class family should have, and then deriving the income needed to purchase them. In practice, this approach has only been taken for measuring the level of absolute poverty in Canada.<sup>27</sup> Another rationale would be defining what income is needed to start accumulating significant amounts of wealth to provide the security associated with a middle-class existence and the saving to make the investments in human capital needed to protect it.

Assertions of what a middle-class lifestyle requires often substantially overestimate the minimum income needed to qualify as middle class compared with the other two approaches just outlined. Some estimates range between \$40,000 and \$70,000<sup>28</sup> or between \$50,000 and \$100,000<sup>29</sup> (in constant dollars) over time. Ivanova uses a range of \$40,000 to \$125,000, loosely based on quintiles of post-transfer but pre-tax income for families of two or more persons.<sup>30</sup> No rationale for these thresholds is offered, other than that they seem “reasonable” for what is needed to achieve a middle-class lifestyle. Another drawback of fixed income levels is that they imply no expectation that middle-income earners participate in economic growth, the norm for our society over any significant period of time.

The lower-bound thresholds used in these arbitrary definitions of the middle class are completely out of line with the definitions used by academics and statisticians. The research cited earlier in this section that defined middle class as a range around the median suggests a lower bound for the middle class of about \$15,000 a year for an individual or \$25,000 for a family, which is more realistic. Andersen and McIvor found that 62.1 per cent of Canadian families—close to the middle three quintiles—earned between \$20,000 and \$75,000 in 2004, and that it was at the \$20,000 threshold that median net worth becomes significant.<sup>31</sup>

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<sup>26</sup> M. Frenette, D. Green and K. Milligan, “The tale of the tails: Canadian income inequality in the 1980s and 1990s,” *Canadian Journal of Economics* 40, 3 (August 2007): 754-755.

<sup>27</sup> Chris Salo, “Poverty: Where do we draw the line?” Fraser Institute Research Studies (November 2013).

<sup>28</sup> Quoted in Peter Edelman, *So Rich So Poor* (New York: The New Press, 2012), 61.

<sup>29</sup> Mark Milke, *Tax Me I'm Canadian* (Calgary, Alta.: Thomas and Black, 2013), 111.

<sup>30</sup> Iglia Ivanova, “What is a middle class income these days?” *Progressive Economics*, July 12, 2011, [www.progressive-economics.ca/2011/07/20/what-is-a-middle-class-income-these-days/](http://www.progressive-economics.ca/2011/07/20/what-is-a-middle-class-income-these-days/)

<sup>31</sup> However, the usefulness of this statistic is questionable because it comes from the very small sample for 2005 in Statistics Canada’s “Survey of Household Wealth.” Robert Andersen and Mitch McIvor, “Growing Inequalities and Their Impacts in Canada,” GINI Country Report, Canada (January 2013), [gini-research.org/system/uploads/507/original/Canada.pdf?1373493076](http://gini-research.org/system/uploads/507/original/Canada.pdf?1373493076).

Applying these definitions of the minimum income needed to be considered middle income show unambiguously a decline in people living below middle income over the long term, including a continued small decline in the aftermath of the recession that hit in 2008. The proportion of Canadians reporting total income of less than \$20,000 (in constant dollars) has fallen from 50.4 per cent in 1976 to 43.5 per cent in 1998 and then to 36.9 per cent in 2011 (see Table 1). Include all people earning less than \$40,000, and the share falls from 70.9 per cent to 69.5 per cent and then to 62.4 per cent in 2011, with all of the decline in the under-\$20,000 group partly offset by an increase for higher-income groups.<sup>32</sup>

**TABLE 1** DISTRIBUTION OF INDIVIDUAL INCOMES, 1976-2011

	1976	1998	2008	2011
Less than \$20,000	50.4	43.5	37.1	36.9
\$20,000 to \$30,000	10.7	14.5	14.4	14.4
\$30,000 to \$40,000	9.8	11.5	12.0	12.1

Source: Statistics Canada, *Survey of Labour and Income Dynamics, Cansim Table 202-0402*.

## 5. MEASURING INCOME

Once a definition of the range of middle-class incomes is established, the statistical problems of measuring it multiply quickly. The first question is how to define income and what data source to use? Hourly wage rates or weekly earnings are sometimes used. These are usually based on employer records, and are an accurate measure of base earnings. However, hourly or weekly earnings miss many forms of compensation, such as supplementary labour income, bonuses and non-monetary compensation like time off. Non-wage benefits are particularly important in the public sector, with one study for the U.S. finding that they added between 10 and 13 per cent to public service incomes.<sup>33</sup> Supplementary labour income is dominated by employer contributions to pension and health benefits, and is a larger share of low and middle incomes. Bonuses and options are concentrated in high incomes.

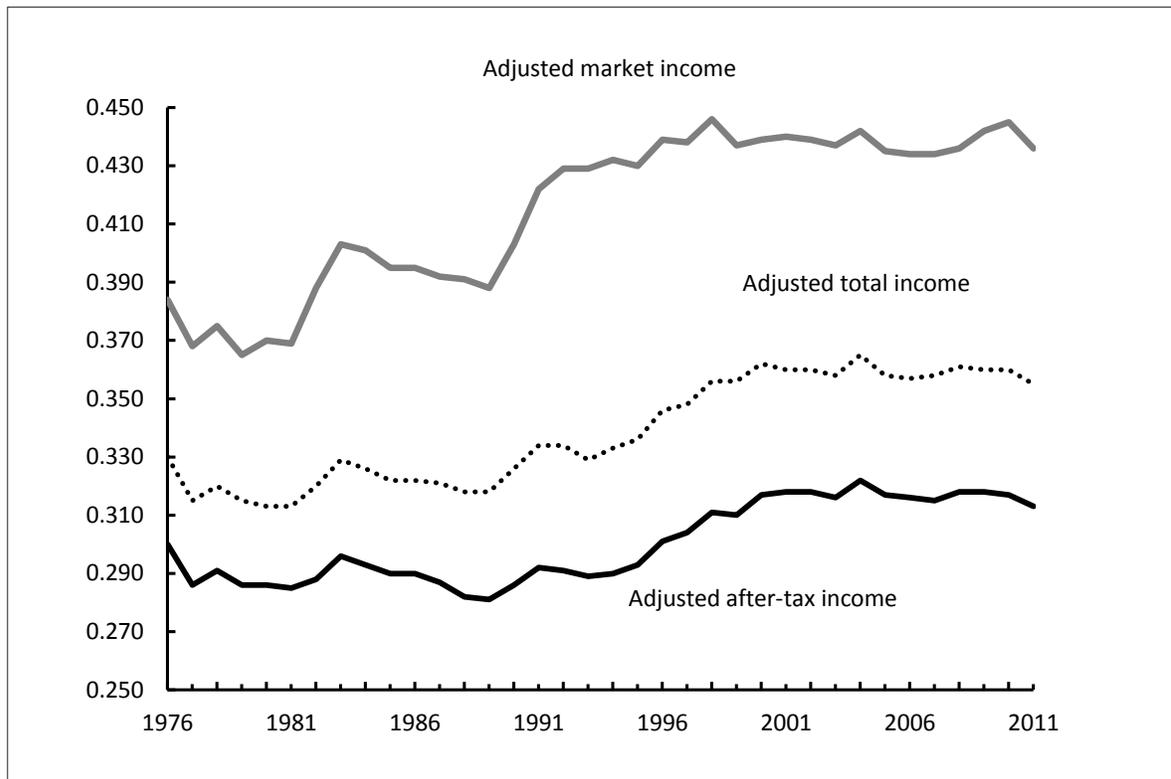
An important difference results from measuring income before or after government taxes and transfers. Market forces are pushing towards more inequality before taxes and transfers, but the tax and transfer system is reducing the inequality of actual outcomes. This can be seen in Figure 2 below, which presents Gini coefficients for all incomes (and not just the middle class) in order to measure the wedge that taxes and transfers create between market incomes and disposable incomes. The Gini coefficient for earned income before transfers and taxes rose 13.5 per cent between 1976 and 2011, based on data from the Survey of Consumer Finances (almost all of this increase occurred by 1992).<sup>34</sup> However, after accounting for transfers, the increase in inequality rose only 7.6 per cent, a reduction of nearly one-half. Finally, accounting for both transfers and taxes lowers the increase in inequality to 4.3 per cent, over two-thirds less than the increase in inequality in the marketplace. Income inequality after transfers and taxes peaked in 2004 and then fell steadily, except for a slight uptick during the recession. It is noteworthy that all three measures of inequality have increased over time, although most of this increase occurred in the 1980s and 1990s.

<sup>32</sup> See also René Morissette and Charles Berube, “Longitudinal Aspects of Earnings Inequality in Canada,” Statistics Canada Catalogue No 11F0019MPE, 94 (July 1996), 13. This study excluded the unemployed, and so the data are not strictly comparable to the household survey data.

<sup>33</sup> Maury Gittleman and Brooks Pierce, “Compensation for State and Local Government Workers,” *Journal of Economic Perspectives* 26, 1 (Winter 2011): 234.

<sup>34</sup> While there are limitations to trying to summarize the distribution of income in one index, we use the Gini coefficient in this instance not as a measure of income distribution, but to show how income distributions compare, which is not possible without using a summary number.

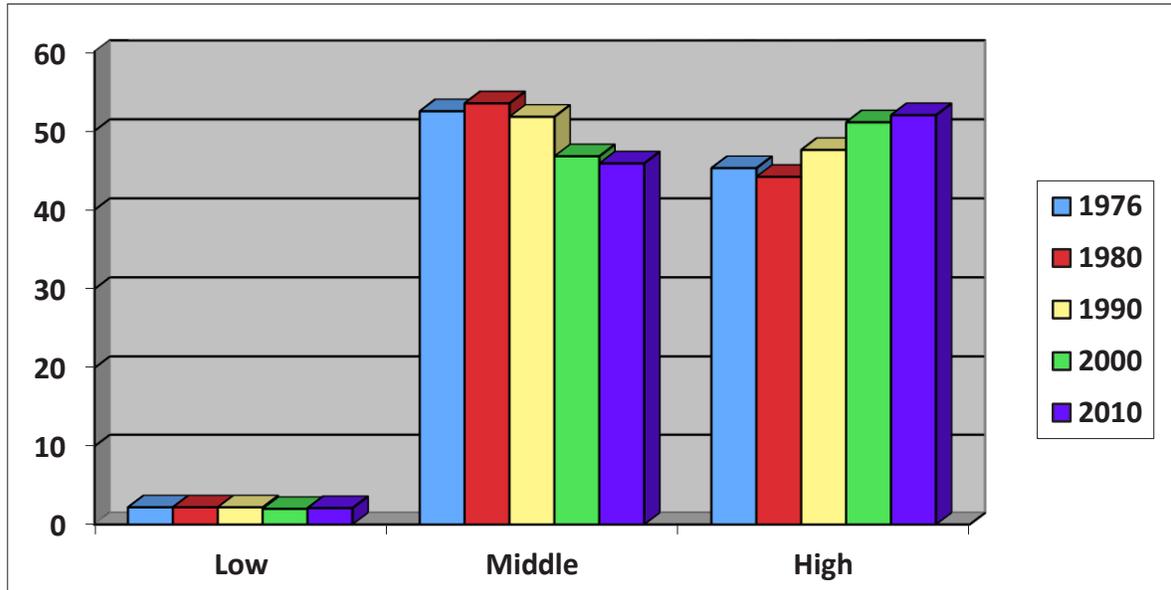
FIGURE 2 GINI COEFFICIENTS OF ALL FAMILY UNITS INCOME



Statistics Canada publishes data on income distribution by quintile for market income and income after taxes and transfers.<sup>35</sup> Figure 3 shows that, between 1976 and 2010, the share of market-produced income going to the high-income group has been on an upward trend. This gain was the mirror image of the decline in the share going to the middle-income group. The low-income group gains little, which has not changed over 30 years.

<sup>35</sup> These data include economic families and unattached individuals. An economic family is defined as a group of two or more persons who live in the same dwelling and are related to each other by blood, marriage, common law or adoption. An unattached individual is a person living either alone or with others to whom he or she is unrelated, such as roommates or a lodger. The concept of income covers income received while a resident of Canada or as relevant for income tax purposes in Canada. Market income is the sum of earnings (from employment and net self-employment), net investment income, private retirement income, and the items under other income. It is also called income before taxes and transfers. Total income refers to income from all sources including government transfers and before deduction of federal and provincial income taxes. It may also be called income before tax (but after transfers). After-tax income is total income less income tax. It may also be called income after tax. All the units of the population, whether unattached individuals or families, are ranked from lowest to highest by their family after-tax income.

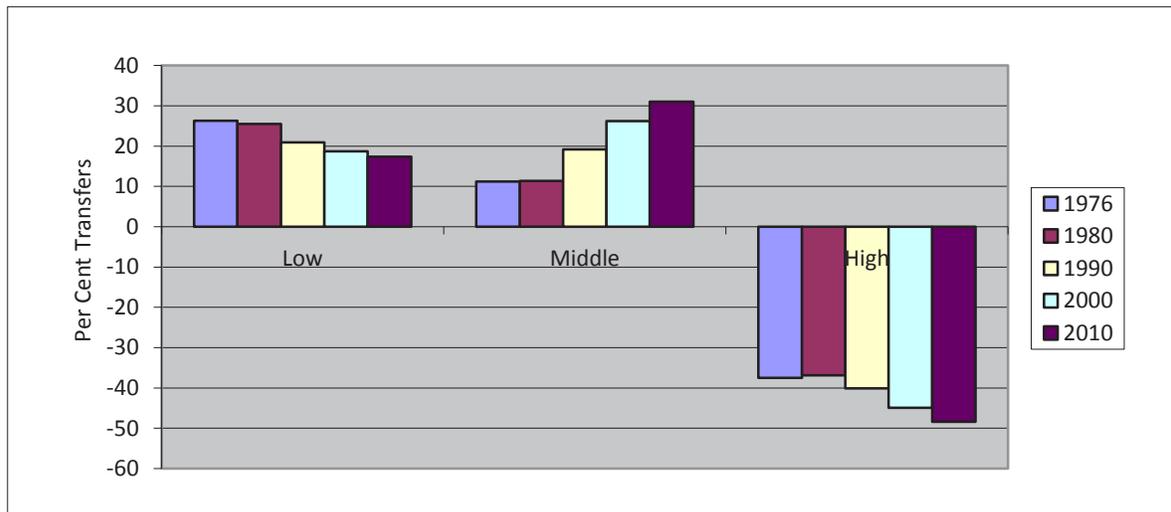
**FIGURE 3 MARKET INCOME SHARES, CANADA, 1976 TO 2010**



Source: Statistics Canada, Cansim Table 202-0703.

Figure 4 provides information on net transfers. In 1980, for every dollar earned, high-income Canadians made a net contribution of 37 cents to the tax-transfer system of which 26 cents were given to the low-income group and 11 cents to the middle class. By 2010, the net contribution of the high-income group had risen 11 cents from 1980 to 48 cents. Of this higher amount, governments gave 17 cents to the low-income group—a decrease of nine cents from 1980—and 31 cents to the middle-income group—an increase of 20 cents from 1980. This is a major increase in redistribution to the middle class, accomplished by increased taxes on the high-income group and lower taxes for the middle class and increased transfers to the middle class matched by reduced transfers to the low-income group. Overall, tax policy offset about half of the market-income losses of the middle class through the tax transfer system.

**FIGURE 4 NET TRANSFERS BY INCOME CLASS (PER CENT)**



Source: Statistics Canada, Cansim Table 202-0704.

This raises a number of substantive public policy issues such as: should and can anything be done to deal with market forces operating to shift income shares away from those with middle incomes to those with high incomes? Should and can public policy effectively offset the market-driven income losses of the middle class? If so, by how much? Is the policy approach of the past three decades of offsetting about half of the losses too much, too little or just right? And is it appropriate that the middle-income group was not only helped by more net transfers from those with high incomes, but also by lower net transfers to those with low incomes?

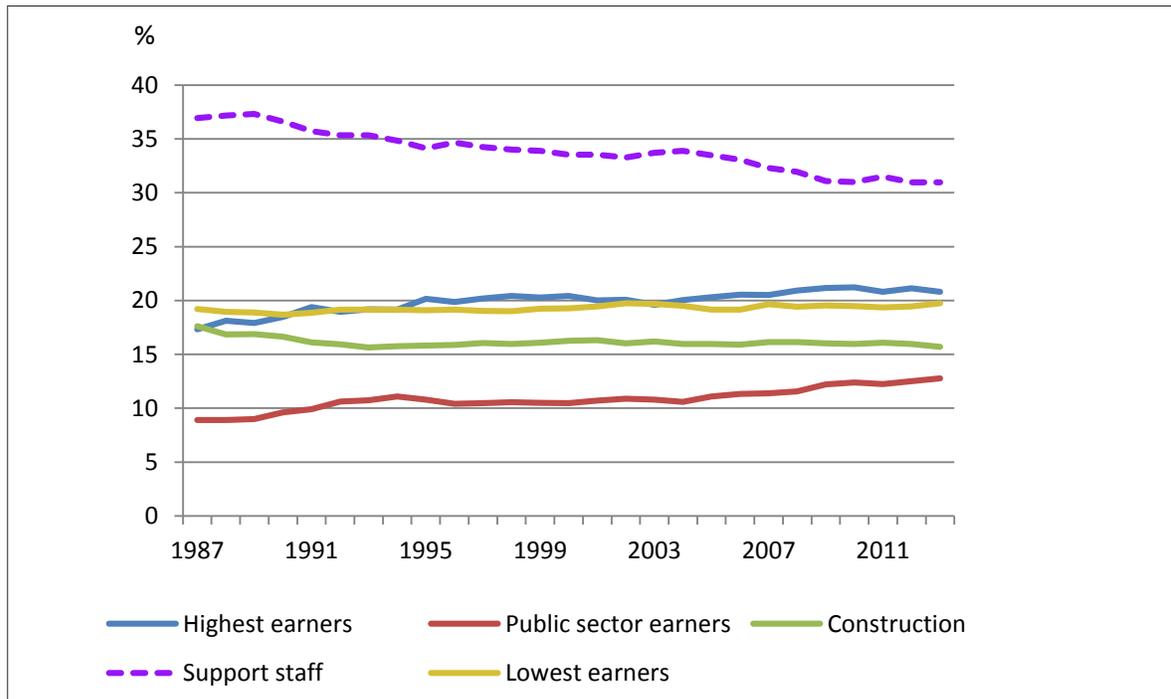
## 6. OCCUPATIONAL EARNINGS

As noted in the introductory discussion, people identify with their occupation more than with the industry they work in. Average earnings by occupation is a rough way of adjusting for expected income over longer periods—even if a worker starts out at the bottom of a pay scale in a particular occupation, most workers will gravitate to the average earnings for that occupation over time. This helps to smooth out some of the noise from annual fluctuations in income. As well, occupational pay has a narrower range than industry data, because occupational pay rates cut across industries: an accountant is more likely to be paid about the same no matter what industry he works in. The pay range within an industry extends from senior managers to clerks.

We create five occupational groups, based on their weekly pay in 1997 (which is when occupational pay began to be collected from the Labour Force Survey, although occupational employment data go back to 1987). The top income group earned over \$750 a week, and includes management, workers in the natural sciences, and elite workers in trades and transportation. A second group earned between \$700 and \$750 a week, consisting exclusively of public-sector workers in health and education (as noted, this understates the supplementary benefits that public-sector workers receive). A third group earned slightly above-average wages of between \$600 and \$700 a week, and included mostly construction labourers, plus a small number of people in protective services and wholesaling. A diverse group earned between \$450 and \$550 a week, and included clerks and assistants to construction and health (who essentially provide support services to higher-paid construction and health workers) as well as occupations in the primary and manufacturing industries. The lowest-income group earned around \$300 a week because of the combination of low pay and a predominance of part-time work in occupations related to retailing, child care, accommodation and food.

Since 1987, occupations paying above-median weekly earnings increased from 43.8 per cent of all jobs to 49.3 per cent in 2013. The increase was about equally split between the highest group of earners (dominated by management and business professionals) and public-sector professional in health care and education. These gains were slightly offset by a drop of two percentage points in the share of employment held by the third group, although this mostly reflected the loss of construction jobs in the early 1990s, and its share has since stabilized (Figure 5).

**FIGURE 5 SHARE OF EMPLOYMENT BY OCCUPATIONAL GROUP**



Source: Statistics Canada Labour Force Survey, Cansim Table 282-0010

The proportion of jobs with below-average earnings fell by 5.3 percentage points between 1976 and 2013. The drop was concentrated in the support services provided by the fourth group, off 5.9 percentage points. Most of the decline originated in the primary and manufacturing occupations, down 5.1 percentage points. The lowest-paid occupations edged up from 19.2 per cent to 19.8 per cent of all jobs.

To summarize, the occupational data show some polarization of earnings, with growth among the highest-paying and lowest-paying occupations, which almost exactly correspond to the top and bottom quintiles. However, the total increase in the share of the top and bottom occupations was relatively small, totalling 2.7 percentage points since 1976. This implies that the “middle” occupations lost 2.7 points. The middle 60 per cent of jobs was divided between more employment for those earning above-average incomes and job losses for those earning less than the average. This is consistent with most other findings reviewed in this study of a slight shrinkage of the middle class, almost equally from moving up the income ladder as from moving down.

However, there were larger changes within these middle occupations. The highest-earning occupations gained ground, expanding by 1.3 points due to the expansion of the public sector. The next tier of above-average-earning occupations saw no change. The lower middle-class occupations, earning about \$36,000 a year, saw their share of jobs drop 4.0 percentage points, the only group to shrink. The entire decline originated in the primary sector, and especially the manufacturing sector.

Some may be surprised that manufacturing jobs are occupations of below-average pay. Manufacturing has long had an undeserved reputation for high pay. That has never been the case. At best, manufacturing jobs used to pay slightly more than average hourly earnings, while since 2010 they have been slightly below average. What burnished manufacturing’s reputation as the backbone of the middle class was that it paid average wages for people with below-average human capital. In the postwar era, people with only a high school education had a chance of factory employment at average pay or slightly below, but rarely at above-average pay.

Put another way, the only thing exceptional about factory pay in the postwar era was not its level in absolute terms, which was ordinary, but its level given the low human capital of its labour force. In the early postwar era, providing middle-class jobs to the large number of people with low skills (especially men returning from the war) was important to society. Today, with the large increase in human-capital investment in youths, creating jobs that require low skills is not as important. Indeed, for manufacturing it is a recipe for extinction, as these are precisely the jobs that are vulnerable to overseas competition.

The postwar model of average pay at a factory for below-average skills has been broken for over a decade. Low-paying jobs of less than \$12 an hour in manufacturing peaked at 605,000 in 1999. This was the heyday of the low-wage model of Canadian manufacturing, when a low Canadian dollar fuelled rapid growth in low-wage industries such as textiles, clothing and furniture. Since then, these low-wage factory jobs have plunged 89 per cent to 128,100 in 2013. Middle-skilled factory jobs that pay between \$12 and \$20 an hour began to shrink after the burst of the dot-com bubble, from 903,000 in 2002 to 754,000 before the recession in 2007, and then to 587,000 last year. Slightly higher-paying factory jobs between \$20 and \$30 an hour have offset some of these losses, rising from 456,500 in 1997 to 528,300 in 2013, despite some losses during the recession. Meanwhile, the highest-paying manufacturing jobs at \$30 or more an hour have quadrupled, from 90,500 in 1997 to 414,600 last year. Given this marked shift of manufacturing jobs from plentiful but low-paying to scarce but high-paying, manufacturing is realizing its reputation as a steady source of middle-class incomes. Not all analysts are pessimistic that factory jobs will continue to disappear in the future. The offshoring of low-skill jobs to developing countries may have run its course, leaving a manufacturing sector in developed countries with about the same share of the total in 2010 (15.5 per cent) as it had in 1800, when the Industrial Revolution was beginning.<sup>36</sup>

Outside of manufacturing, the increase in the share of occupations with above-average pay is consistent with other research that finds that some of the shrinkage of the middle class reflects a move into the highest-income group. This raises the question of whether a sharp increase in the earnings of a particular profession means its members are no longer middle class. Professionals in business, education and health services may earn much higher incomes today, but have stopped being middle class only because the definition of middle class (such as earning no more than 25 per cent above the median or earning less than the top 20 per cent of incomes) may be too restrictive.

It may be time to reconsider the definition of middle class and whether a separate classification of working class would clarify its status. Classifying the middle class as the middle 60 per cent of the income spectrum implies grouping together the middle three occupational groups in Figure 5: public-sector professionals, construction and factory workers, and support staff. In reality, public-sector professionals increasingly share the human-capital and income characteristics of the highest-paid managers and professionals in the top quintile (especially taking into account the value of public-sector pensions). Meanwhile, low-paying manufacturing jobs disappeared, leaving factory jobs with a high pay on par with construction jobs. In more recent years, support-staff jobs share more characteristics with the lowest-income earners, including higher job insecurity and the threat of automation. This argues for resurrecting the traditional distinction between the middle class and the working class. The middle class is based on human capital and is better paid than the working class. The working class, like the lower class, provides services to the middle- and upper-class groups. The concerns commonly expressed about the future of the middle class are really concerns about the working class. The trend of jobs and incomes for well-paid public-sector workers and low-paying factory jobs should not be confused in the public debate about middle-class outcomes.

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<sup>36</sup> Peter Marsh, "The New Industrial Revolution: Consumers, Globalization and The End of Mass Production" (New Haven, Conn.: Yale University Press, 2012), 243. The share of manufacturing jobs in developed countries peaked at 49.3 per cent in 1900.

## 7. OVER WHAT PERIOD SHOULD INCOMES BE MEASURED?

One of the most crucial questions to be answered is over what time period income should be measured. Annual income data is presented “in a way that suggests that the different income brackets represent enduring classes of people over time.”<sup>37</sup> However, statistics that show a decrease in the proportion of people meeting a middle-class standard and an increase in lower-class outcomes do not prove that middle-class people are sliding down the income scale. It could be that young people or immigrants, who used to quickly attain middle-class status, now spend more time in low income before moving into the middle class. Only panel data that followed individual incomes over time can determine if members of the middle class are actually losing ground.

Statistics Canada compiled panel data from the SLID to study mobility in 2010 compared with a decade earlier. The results show a slight increase in upward mobility for the three middle-income quintiles, and a slight decrease in downward mobility. Overall, an average of 19.4 per cent of people in the middle-income quintiles moved into a higher quintile between 2009 and 2010, down slightly from 19.6 per cent in 2004 and 20.3 per cent between 1996 and 1997 (Table 3).<sup>38</sup> Meanwhile, an average of 18.0 per cent of people in the middle quintiles shifted into a lower-income quintile in 2009, compared with 18.9 per cent in 2004 and 20 per cent in 1997. The improvement in the direction of mobility, with more people moving up than down, is evident for all three of the middle-income quintiles. That is, it is robust to different definitions of the middle-class quintiles. Moreover, the time periods used should have tilted the results to more downward mobility, since 2009 would reflect the impact of a severe recession, while the late 1990s were a period of accelerating growth.

Measuring mobility over longer periods increases the movement between income quintiles. From 2005 to 2010, 34.0 per cent of people in the three middle-income quintiles moved into a higher income group, while 30.2 per cent slid down the income ladder. These rates of mobility are nearly twice as high as the annual changes quoted in the previous paragraph, as longer periods of time give people more opportunity to change their income. Longer periods also produce more stable rates of mobility; the six-year rate of mobility between income quintiles ending in 2010 was little changed from the previous six-year period, with a 1.4-point increase in the share of middle-income earners moving to a higher quintile and a 0.8-point increase moving down. By comparison, annual changes in mobility fluctuate up to 3.6 percentage points, reflecting how non-recurring events (such as illness, a bad investment or other such bad luck) play a greater role in annual changes but are reversed over longer periods. However, using longer periods of time means that the life cycle effects of people earning more as they gain experience and skills starts to mask what the economy is capable of paying middle-class earners, which is the more relevant question.

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<sup>37</sup> Thomas Sowell, *Dismantling America* (New York: Basic Books, 2010), 84.

<sup>38</sup> All the data in the next two paragraphs are from Statistics Canada, “Income in Canada, 2010,” Statistics Canada Catalogue No 75-202-X, Table 3.

**TABLE 2 ONE- AND SIX-YEAR RELATIVE INCOME MOBILITY**

Length of period	Period	Quintile	Proportion of persons who moved to a		Total mobility
			higher quintile	lower quintile	
%					
One-year	2003-2004	Overall	16.2	15.3	31.5
		Lowest	22.3	0.0	22.3
		Second	22.8	14.8	37.6
		Third	20.9	20.4	41.3
		Fourth	15.1	21.6	36.7
		Highest	0.0	19.8	19.8
	2006-2007	Overall	16.6	15.9	32.6
		Lowest	24.0	0.0	24.0
		Second	22.1	16.4	38.5
		Third	21.1	20.3	41.4
		Fourth	16.0	21.9	37.9
		Highest	0.0	21.1	21.1
	2008-2009	Overall	18.9	16.2	35.2
		Lowest	24.8	0.0	24.8
		Second	27.1	14.0	41.1
		Third	24.0	20.6	44.5
		Fourth	18.8	23.2	42.0
		Highest	0.0	23.5	23.5
2009-2010	Overall	16.2	14.8	31.0	
	Lowest	23.0	0.0	23.0	
	Second	22.3	14.7	37.0	
	Third	21.1	18.3	39.4	
	Fourth	14.8	20.9	35.6	
	Highest	0.0	20.2	20.2	
Six-year	1999-2004	Overall	28.0	26.3	54.3
		Lowest	42.3	0.0	42.3
		Second	39.1	19.8	58.8
		Third	33.4	31.5	65.0
		Fourth	25.3	37.0	62.3
		Highest	0.0	43.0	43.0
	2005-2010	Overall	29.1	26.8	55.9
		Lowest	43.5	0.0	43.5
		Second	42.1	19.8	61.9
		Third	34.4	30.9	65.3
		Fourth	25.5	40.0	65.5
		Highest	0.0	43.4	43.4

Source: Statistics Canada, "Income in Canada 2010," Catalogue no. 75-202-X2010000.

These results imply that low-income people take longer to move up to the middle quintiles (a separate question is what the income of these middle quintiles were doing, which is discussed in the previous section). The proportion of people in the lowest-income quintile who moved into higher quintiles

declined from 27 to 23 per cent between 1997 and 2010. However, the six-year-period measure of mobility showed a slight improvement. There is little evidence of an increased shift out of the middle class to a lower class, the concern that fuels much interest in this issue.

Low income itself “is largely transitory” according to Statistics Canada.<sup>39</sup> Only 17.3 per cent of people experienced low income for at least one year between 2005 and 2010, down from 24.5 per cent a decade earlier, and only 1.5 per cent were persistently low income in every year. Many people in low income in any one year are there for transitory reasons, such as a temporary layoff, a poor investment result in a particular year, going to school to accumulate skills, or immigrants making their entry into the labour market. If these people do not regard themselves as belonging to a lower income class, their consumption patterns will reflect that, and their income is likely to be higher in a few years. Data show that the vast majority of people in low income in any one year exit from low income in subsequent years. That low income is transitory supports why so few people self-identify as lower class.

Left unresolved is the question of the number of years that should be used to smooth income. The gold standard would probably be lifetime incomes, which would abstract from all short-term variations in income that distort the underlying trend of an individual’s income. In practice, there are two problems. One is that rich people live longer than poor people, which exaggerates the comparison of lifetime earnings. More importantly, it takes decades to compile this data, rendering it useless to answer questions about income distribution in a timely manner. There would seem to be an important age dimension to this question as well, and many researchers restrict their data to people over 25 years to minimize the impact on their results of students and youths making the transition into the labour force.

Results from Statistics Canada show that the distribution of income is not significantly affected if income is averaged over a decade.<sup>40</sup> For the years between 1975 and 1984, the Gini coefficient for inequality among all age groups averaged 0.284; cumulating income over the whole period, which reduces the impact of irregular fluctuations in annual income, only reduces the coefficient 12.0 per cent to 0.250.<sup>41</sup> For the decade between 1984 and 1993, the annual average of the Gini coefficient was 0.314; cumulating income reduces this 10.5 per cent to 0.280. Focusing only on prime-age workers does not significantly change the conclusion that averaging income over long periods reduces inequality by about one-tenth.

There are other ways to incorporate a long-term view of well-being. One perspective on who is middle class is to ask whether a person will be able to maintain the same relative income as his parents.<sup>42</sup> While this has the advantage of focusing on long-term outcomes, it is of little use in answering the question of how the middle class is faring today. One possible approach is to compare income and wealth for specific age cohorts over time. The Bank of Montreal found that young people aged 25 to 34 today have higher employment rates, slightly higher incomes, and substantially more net worth than their parents did in the mid-1980s (although this comparison partly reflects the lingering effect on youths of the severe recession of 1981–1982).<sup>43</sup>

Long-term outcomes hinge on whether a person has the capacity to generate a middle-class lifestyle, not whether — depending on various reasons — he actually does so. On paper, the growing stock of human capital, resulting from education levels rising in our society, is encouraging for the future of the middle class. The problem, of course, is the impossibility of knowing whether the human capital

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<sup>39</sup> Statistics Canada, “Income in Canada, 2010,” Statistics Canada Catalogue 75-202-X (2012), 1.

<sup>40</sup> Morissette and Berube, “Longitudinal Aspects,” 23. The data only include male workers with positive earnings in all years. If income was averaged over six years instead of 10 years, the reduction in equality would be about nine per cent.

<sup>41</sup> Statistics Canada, Cansim Table 202-0709.

<sup>42</sup> Branko Milanovic, *The Have and the Have-Nots* (New York: Basic Books, 2012), 171.

<sup>43</sup> Sal Guatieri, “Household Finances: Are Young People Worse Off than Their Parents Were in the 1980s?” BMO Capital Markets, May 16, 2014.

someone possesses today will be sufficiently in demand in the future to generate a middle-class income. One example is the increasingly poor outcomes for unskilled workers, who used to land middle-class jobs. Another example is falling demand for university graduates with degrees outside of the fields of science, engineering and commerce. The worsening of outcomes for many youths shows the problem of focusing only on the supply of human capital. Some have argued that the value of human capital from education is exaggerated, and that employers see a university degree as a signal that the possessor had the credentials to be a reasonably responsible member of the labour force, as much as they look for the specific knowledge the graduate possesses.<sup>44</sup>

## 8. ANNUAL INCOME DATA SOURCES

The two major sources of annual measures of income are from surveys of households and tax records. Household surveys of incomes ask a sample of people how much they earn. Income tax data are less timely but more complete. Tax data are the source of the calculation in the System of National Accounts of personal disposable income. Tax-based income measures can be used as a cross-check against the accuracy of survey data.

The results of comparing survey and tax data for incomes are disquieting. In an exhaustive comparison of income statistics from different sources published in 2010, Statistics Canada found that personal income from the national accounts exceeded its three other measures (two based on surveys, including the census, and one using administrative data) by an average of \$854.3 billion, or 21.2 per cent of income in 2005.<sup>45</sup>

One widely cited result from the Survey of Labour and Income Dynamics, consistent with census data on incomes, shows a slow gain of 14.3 per cent in real incomes after taxes and transfers over the past 30 years. However, real disposable income from the national accounts based on tax records and deflated by the implicit price index (IPI) for personal expenditure posted a 43.5 per cent gain between 1981 and 2011 (national accounts data currently only go back to 1981).<sup>46</sup> As can be seen in Figure 6, this divergence began in the first decade up to 1991, when the SLID income measure fell an improbable 7.5 per cent while disposable income rose six per cent. The gap narrowed in the 1990s when the SLID methodology was switched from asking respondents to recall their income to asking permission to use income tax data for that information (about 80 per cent of respondents allow access to tax records). This shift to using tax data was followed by the census in 2006. These changes are an overt admission by Statistics Canada that tax data are better for measuring incomes than surveys of households. However, the gap between the two sources has opened up again over the last decade, with disposable income rising nearly twice as fast as the SLID measure (15.7 per cent versus 8.4 per cent). About half of the divergence reflects the recent difference between using the CPI and the implicit price index (IPI) for personal expenditure, which became noticeable as the exchange rate began to appreciate (which lowered the cost of travel abroad, which is captured in the IPI but not the CPI).

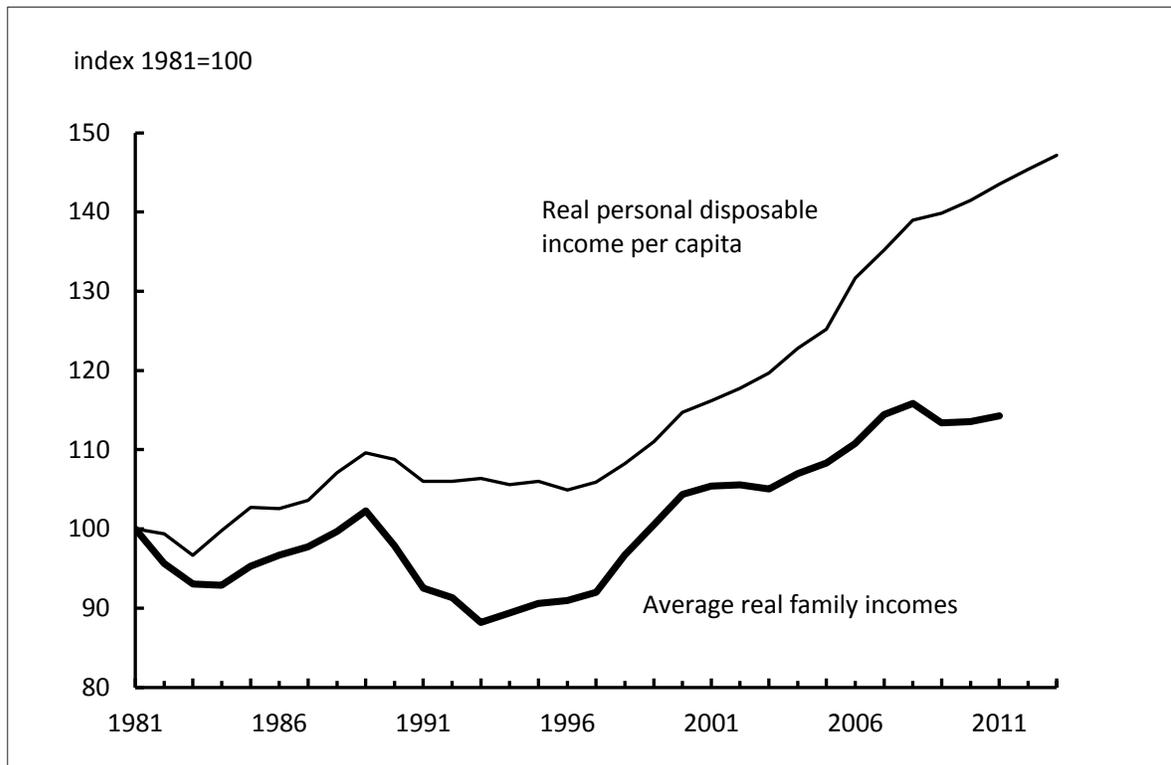
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<sup>44</sup> An example is Glenn Reynolds, *The Higher Education Bubble* (New York: Encounter Books, 2011), 5.

<sup>45</sup> Statistics Canada, Income Statistics Division, "Comparing Income Statistics from Different Sources: Aggregate Income, 2005," Statistics Canada Catalogue 75F0002M, 002 (2010), 7. The two survey measures (from the SLID and Census of Population) and administrative data from the Annual Estimates for Census Families and Individuals were within \$22.6 billion or 2.7 per cent of each other.

<sup>46</sup> The inconsistency between household and tax data has been observed in many countries. See Angus Deaton, "Measuring poverty in a growing world, or measuring growth in a poor world," *Review of Economics and Statistics* 87, 1 (2005): 1-19.

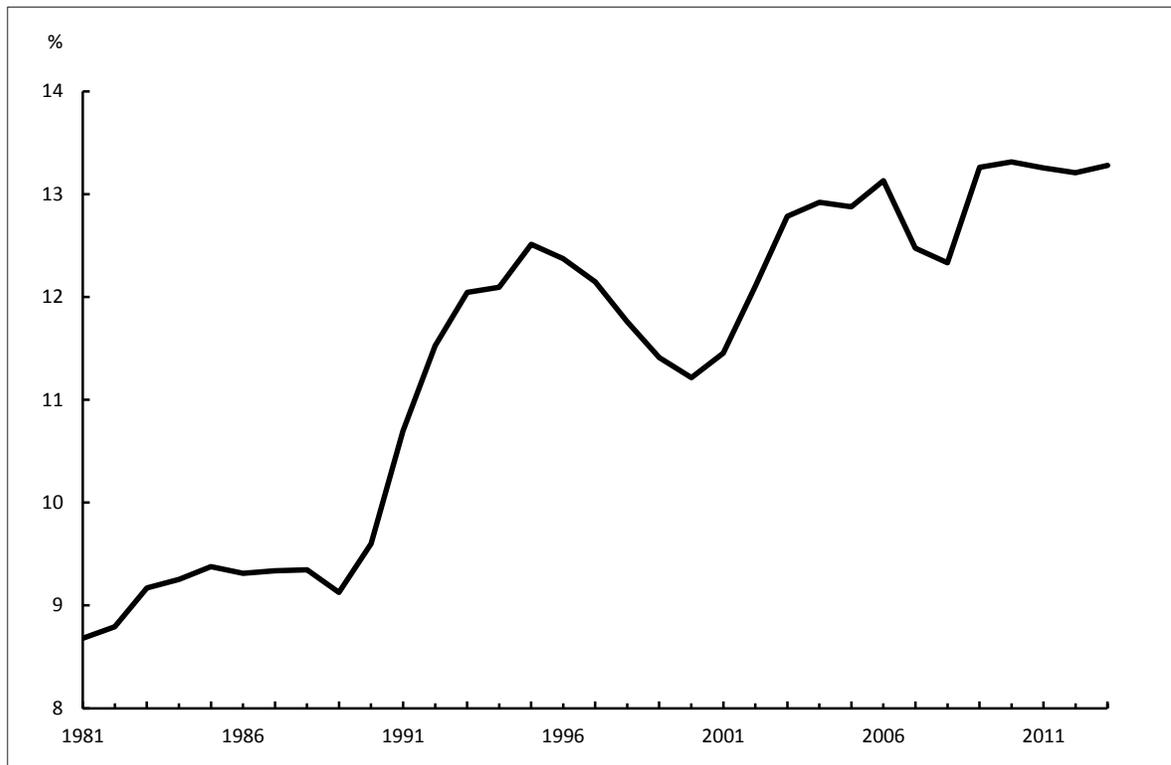
FIGURE 6 AVERAGE REAL INCOMES



The gap between income measured by household surveys and income tax data is hardly unique to Canada “but appears in many countries.”<sup>47</sup> One reason households routinely underestimate their income in surveys is they respond as if only wages and salaries are income, ignoring the growing importance of supplementary benefits such as employer contributions to pensions or health care that are included in taxable benefits. As can be seen in Figure 7, supplementary labour income (mostly employer contributions to retirement and health plans) alone have grown rapidly in recent years, and now account for just over 13 per cent of all labour income. Most of these benefits accrue to middle-income earners, something that should be taken account of when examining how their real income has fared in survey data. As well, surveys exclude irregular sources of income, such as bonuses or stock options. It is possible to partly reconcile the two through different concepts of income, but household survey data clearly miss important sources of income.

<sup>47</sup> Angus Deaton, *The Great Escape: Health, Wealth and the Origins of Inequality* (Princeton, N.J., Princeton University Press, 2013), 245. For an in-depth review of household and tax measures of incomes, see Deaton, “Measuring poverty.” He finds that in the U.S., survey-based measures of income are only between 60 and 75 per cent the size of tax-based estimates.

**FIGURE 7 SUPPLEMENTARY LABOUR INCOME AS A SHARE OF TOTAL LABOUR INCOME**



In fact, the growing importance of non-wage benefits in employee compensation gives employers an incentive to suppress earnings. From the employer’s point of view, every employee has a certain worth for which the employee is compensated. All that matters for the employer is the expense incurred in each employee’s total compensation, not the form it takes of wage earnings or supplementary benefits. If, as has occurred in recent decades, employees want more of their compensation to take the form of benefits, employers will accommodate that by raising benefits but suppressing the increase in earnings. This is exactly what has occurred; the share of wages and salaries in total income (GDP) has fallen from 47 to 44 per cent since 1984, while total labour income has been stable at 51 per cent due to the shift to supplementary labour income. Analysts should be aware that this will result in lower measured gains in earnings that exclude non-wage benefits (such as average hourly or weekly earnings, or wages and salaries) over time, and therefore underestimates the growth of total incomes.

There are other reasons why survey data underestimate incomes. One problem is simply response error; respondents overlook or forget sources of income. It is well known that people at both ends of the income distribution are reluctant to answer such questions; in the words of Steve Landefeld, head of the U.S. System of National Accounts, “Low- and high-income households don’t tend to respond to household surveys.”<sup>48</sup> Overall, Statistics Canada estimates that surveys underestimated government transfers to persons by nearly \$40 billion and investment income by nearly \$80 billion in 2005.<sup>49</sup> SLID respondents under-reported the EI benefits they received by 18 per cent, due to a combination of proxy reporting (by one individual for another member of the household) and the stigma attached to receiving EI benefits.<sup>50</sup> (Other issues with the data on incomes and prices are discussed in the Appendix).

<sup>48</sup> Quoted by Diane Coyle, *GDP: A Brief but Affectionate History* (Princeton, N.J., Princeton University Press, 2014), 225.

<sup>49</sup> Statistics Canada, “Comparing Income,” 7.

<sup>50</sup> Alison Hale, Chantal Grondin and Sylvie Michaud, “Measurement Issues in the Reporting of Unemployment Insurance,” Statistics Canada Catalogue 94-17 (October 1994), 3.

Some income is deferred to the future. The most obvious example is employer contribution to public-service pensions, which some estimate to be worth 20 per cent of a public servant's income. One argument is that civil servants accept some reduction in current incomes in return for higher pension benefits upon retirement, something encouraged by generous provisions for early retirement.<sup>51</sup> This compensation, however, is not reflected in income earned while working. Public-sector workers may prefer benefits over wage compensation because they are older and more risk averse.<sup>52</sup>

## 9. CONSUMPTION AND LONGER-TERM WELFARE

Given the complexities of using income as the sole measure of middle-class status, it is worth considering other metrics. There are several conceptual advantages in using consumption and not income to define middle-class status. One, it avoids some of the problems related to defining and measuring income, as will be discussed later. Second, it circumvents the question of where the money comes from (transfers from friends and family are notoriously hard to measure, as is government-subsidized housing) and focuses on outcomes.

Intra-family transfers are largely undocumented but nevertheless are likely to be important. France alone has good data sources, dating back to the French Revolution's emphasis on the intergenerational transfer of inequality.<sup>53</sup> The results, if even roughly representative for Canada, are disruptive for analysis based on earned income. In France, transfers within the family have risen to over one-quarter of national income, nearly evenly divided between gifts made while alive and bequests after death. Gifts have increased recently, as longer life expectancy means that bequests are not received by children until they are in their 50s. Instead, inheritance is increasingly transferred in two steps. First, gifts are made to offspring, often in their 30s and often related to their moving into a home. The remaining inheritance is made by bequest upon the parents' death. These transfers are not captured in income data, and are systematically underestimated in surveys. However, their impact surfaces in data on consumption and wealth. This paper does not attempt to adjust for intra-family transfers because of a lack of adequate data for both the amounts involved and their distribution within families. Using consumption data obviates the need to measure the formal and informal tax and transfer systems.

Focusing on consumption has several practical advantages over income. While annual income fluctuates for a variety of reasons, annual consumption "is chosen by individuals and households with knowledge of their past and future income prospects. It may provide a more accurate reflection of their level of material well-being than their annual income."<sup>54</sup> Consumption has the advantage of measuring actual outcomes in terms of material well-being, whereas income measures the opportunity to consume, which may or may not be exercised. Consumption better reflects non-monetary resources, such as the ownership of durable goods like homes and vehicles, or government subsidies for programs such as health or child care.<sup>55</sup> More broadly, consumption levels are likely to be based on individual judgments about lifetime wealth. A low-income family receiving a windfall is unlikely to spend it all, while an upper-income investor experiencing a poor year will continue to spend at a high level. This is why, for example, nearly 185,000 households with incomes below \$5,000 in 2004 reported average consumption

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<sup>51</sup> Geoffrey Young, "Winners and Losers: The Inequities within Government-Sector, Defined-Benefit Pension Plans. C.D. Howe Institute Commentary 347 (April 2012).

<sup>52</sup> Maury Gittleman and Brooks Pierce, "Compensation for State and Local Government Workers," *Journal of Economic Perspectives* 26, 1 (Winter 2011), 224.

<sup>53</sup> Thomas Piketty, *Capital in the Twenty-First Century*. Belknap/Harvard University Press, 2014, p 337.

<sup>54</sup> Krishna Pendakur, "Consumption Poverty in Canada, 1969-1998," *Canadian Public Policy* XXVII, 2 (2001): 126.

<sup>55</sup> Bruce Meyer, "Measuring American Poverty," Testimony Before the Subcommittee on Income Security and Family Support of the House Committee on Ways and Means, July 17, 2008, 5.

of nearly \$20,000.<sup>56</sup> Alternatively, one can have a high income but be servicing considerable debt (from student loans, for example) that leads to lower consumption. Pendakur finds that one-half of individuals with low income have consumption that is not low, and that consumption inequality is much less pronounced than income inequality and varies much less from year to year.<sup>57</sup>

One drawback of consumption as a measure of well-being is that a person can have substantial resources of either income or wealth, yet may simply decide not to consume them. The reasons can vary, from saving for a future investment such as a home to wanting to leave a substantial inheritance. Ideally, one would want to look at all the variables related to consumption, income and wealth simultaneously but, as we will see, it is often difficult to obtain good data on one, let alone all three. Another limitation of this data is that it is only available for the household unit, not individuals, since consumption is done on a communal basis.

Statistics Canada provides consumption by income quintile starting in 1986.<sup>58</sup> Between 1986 and 2010, consumption by the three middle-income quintiles rose slightly faster than for the highest income quintile (91 versus 88.3 per cent), but not nearly at the rate of increase for the lowest-income quintile (up 146.1 per cent). Looking at the results between 2002 and 2010 shows consumption rising faster as income declines; the highest quintile consumed 17.8 per cent more in 2010 than in 2002, compared with 22.5 per cent for the second-highest quintile, 27.2 per cent for the middle quintile, 32.9 per cent for the second-lowest quintile, and 54.8 per cent for the lowest quintile.

Wealth provides the resources to finance consumption, either by generating a flow of income or by allowing the selling of or borrowing against assets. The distribution of net worth is available from Statistics Canada's Survey of Financial Security. This survey is conducted intermittently, with results for 1999, 2005 (although the sample that year was so small that it is of little value) and 2012. The first result of note is that substantial net worth begins to appear in the second-lowest quintile (see Table 1). This contrasts with Piketty's finding that one of the defining characteristics of the lower half of the income distribution in Europe is an inability to accumulate significant net worth.

In Canada, only the bottom quintile does not accumulate net worth, with a median value of only \$1,100 in 2012 dollars. The second-lowest quintile has median net worth of \$56,100, much higher than the 20,000 euros Piketty claims for the whole lower half of the distribution in Europe. The next two quintiles in Canada have net worth of \$245,000 and \$575,000 respectively, enough to generate a flow of income (or to reduce expenses, for example, by buying a home instead of renting) that would substantially raise a household's well-being. The net worth of these two quintiles was nearly twice as large as in 1999, suggesting that these parts of the middle class were able to accumulate substantial financial and housing assets. Their growth was essentially the same as the 80.7 per cent gain of the top quintile. Only the lowest middle-income quintile was not able to substantially boost its net worth, with a gain of 41.7 per cent between 1999 and 2012 (Table 3).

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<sup>56</sup> Jason Clemens, "Income Inequality: Oversimplifying a Complicated Issue," Macdonald-Laurier Institute (April 2012), 23.

<sup>57</sup> Pendakur, "Consumption Poverty," 139.

<sup>58</sup> The data are for current consumption, which excludes income taxes and gifts. The results from 1998 on are from the Survey of Household Spending; before that, the data are from the Survey of Family Expenditure.

**TABLE 3 DISTRIBUTION AND MEDIAN NET WORTH BY QUINTILE, MILLIONS OF DOLLARS**

	1990		2012	
	Total Net Worth	Median Net Worth	Total Net Worth	Median Net Worth
All Family Units	3,903,014	137,000	8,073,585	243,800
Lowest Quintile	-4,161	1,300	-10,826	1,100
Second Quintile	102,036	39,600	180,292	56,100
Third Quintile	343,419	137,000	728,655	245,000
Fourth Quintile	785,529	313,400	1,735,014	575,500
Highest Quintile	2,676,191	763,700	5,440,451	1,380,000

Source: Statistics Canada, "Survey of Financial Security," *The Daily*, February 25, 2014.

It is noteworthy that all data for wealth statistics also are based on the family, not the individual. This reflects the impossibility of disaggregating a family's purchases to individual consumption. While some forms of wealth can be assigned to an individual (such as savings accounts), other forms are communal, notably real estate, which is the largest asset for most middle-class families. Incomes, however, can be measured for either individuals or family units.

## 10. MIDDLE-CLASS POSSESSIONS/LIFESTYLE

One long line of research has held that being a member of the middle class can be measured by possessions and a certain lifestyle. In the late 19th century, the attributes of a middle-class American lifestyle included "furniture, draperies, carpeting, china and prints."<sup>59</sup> By the 20th century, favourite linchpins for determining middle-class existence included owning a car and a home, being able to take vacations and to save for retirement.<sup>60</sup> The Carnegie Endowment for International Peace has created an index for the rising middle class in developing countries based on the number of vehicles in circulation.<sup>61</sup>

Using possessions as a signpost of middle-class status has the advantage of being the result of accumulated wealth, which is much less variable than annual income. An investor, for example, can have a bad year in financial markets, and still easily maintain a middle-class lifestyle by drawing down savings. Expectations about future income will clearly have an impact; a medical student might have low income now, but probably could begin borrowing and consuming against future income. As well, possessions put the focus clearly on outcomes; whether earned, inherited or even acquired illegally, all that is relevant for class status is their existence.

There are several problems with using possessions to evaluate class status. One drawback of focusing on possessions is that the standard of what is regarded as basic to a middle-class lifestyle changes over time; in the 1950s, only six per cent of Canadian families owned two cars, whereas today many would regard two cars as essential. Another problem is shared consumption: the rising number of young people who live with their parents may have low income and relatively few possessions of their own, but have access to most of the accoutrements of a middle-class lifestyle.

However, the main problem in using the stock of certain assets is that the stock almost inevitably increases over time, irrespective of fluctuations in the flow of income. In Canada, the percentage of households (note that the question is aimed at household, not individual outcomes) having a vehicle

<sup>59</sup> Gordon, *An Empire*, 161.

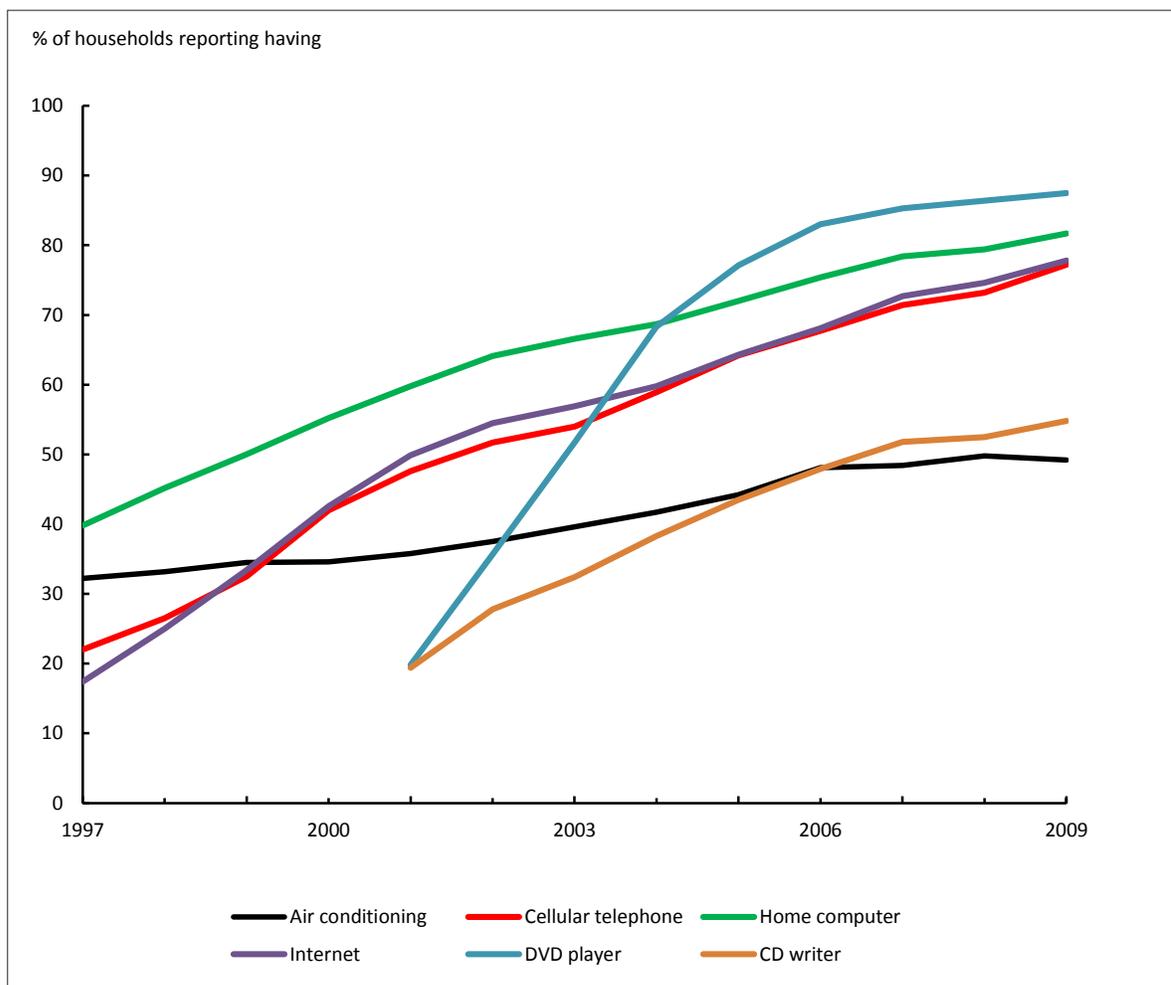
<sup>60</sup> Car ownership became a standard in the 1920s, and home ownership after the Second World War, according to Gordon. *ibid.*, 308.

<sup>61</sup> Uri Dadush and Shimelse Ali, "In Search of the Global Middle Class: A New Index." Carnegie Endowment for International Peace, July 23, 2012.

or house has never declined, even if new purchases drop precipitously. The percentage of households having basic possessions such as vehicles, televisions, household appliances and phones has changed little, often hovering near the saturation point of 100 per cent (which is why Statistics Canada stopped asking about basic appliances in 2010). When the proportion of households possessing certain products declines, such as with landline telephones or VCRs in recent years, it is because the products have been made redundant by technological change, not because they are no longer affordable.

While the level of households possessing a certain good is not revealing, the rate of increase of new products can be. In its Survey of Household Spending, Statistics Canada collects data on the share of households owning certain items. The data do not reveal any trends that suggest the middle class is struggling to acquire new products. The rapid diffusion of new products into a majority of homes since 1997, including computers, Internet connections, DVDs, and even air conditioning, suggests diffusion has not been dampened by a slowdown in middle-class incomes (see Figure 8). The rapid penetration of these new products into a majority of homes is indicative of the ability of the middle class to acquire them, helped by lower prices for these products. If anything, the penetration rate accelerated for DVD players and CD writers, the most recent of these innovations.

**FIGURE 8 HOUSEHOLD ADOPTION RATES**



Some might ask why the rate of home ownership itself is not presented in Figure 8, especially since it has continued to rise in recent years. Part of the answer is that the home-ownership rate changes only slowly over time because of the commitment over decades for repayment in most cases. Its “adoption”

rate is not comparable to that of other consumer goods. As well, some of the recent increase reflects the shift in the population from those least likely to own a home (youths) to aging boomers who have the highest rates of home ownership.

## 11. SELF-IDENTIFICATION WITH A CLASS

Given the difficulty of measuring the middle class in terms of income or consumption, it may seem appealing to simply ask people to self-identify what class they belong to. One problem with this approach is that many people differentiate between the middle class and the working class for reasons that are not clear and appear to change arbitrarily. Much of the distinction seems to come down to the difference between blue-collar and white-collar middle-class workers. However, the usefulness of this distinction is questionable since no one really knows why people choose one and not the other.<sup>62</sup> Worse for measurement purposes is that self-identification can change markedly over time. In 1963, a Gallup poll found more Americans self-identified as working class (50 per cent) than as middle class (45 per cent) but today the middle class is dominant.<sup>63</sup> In Canada, the percentage of people self-identifying as middle class was steady for years, at slightly above 60 per cent, but fell after the 2008 recession to 47 per cent today. This was offset by the share identifying as working class rising from 20 to 31 per cent, despite a drop in blue-collar jobs, implying that other considerations (perhaps lower pay) also factor into the identification with the working class. Another 12 per cent of Canadians say they were upper class, and six per cent self-identify as lower class.<sup>64</sup>

The real problem with surveys of self-identification is the lack of statistical rigour in the definition of class. People respond based on their own subjective evaluation of what is middle class. Given the high percentages of people who identify as middle class, many people who earn quite high or low incomes evidently still feel they are part of the middle class. Some of this is based on a misunderstanding of what constitutes high income; many people feel \$100,000 is not a high income, when less than 10 per cent of individuals earned that much or more in 2011. A further complication is that it is not evident if people assess their individual or their family income when responding. Two individuals earning the same income could answer differently, depending on whether or not they included their spouses' income when assessing their class status.<sup>65</sup> However, other circumstances could create large differences between middle-class self-identification and other statistics; recent immigrants from a poor country may have low incomes by Canadian standards, but still regard themselves as well off by the standards they are used to, and this will determine much of their outlook and behaviour, such as remitting money to family in their former country.

## 12. CONCLUSION

If this paper has succeeded in its aim, the reader should have a greater appreciation of the complexity posed by the seemingly simple question: how is Canada's middle class faring? The concept of class involves a number of variables, not all of them economic or even measurable. Economists and statisticians do their best to supply answers, but inevitably cannot provide a simple answer. Even in a world of perfect data, the absence of a consensus on what is middle class means that even defining

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<sup>62</sup> Although not in the U.K., where up to 70 per cent of people self-identify as belonging to the working class.

<sup>63</sup> Murray, *Coming Apart*, 8.

<sup>64</sup> EKOS Politics, December 19, 2013.

<sup>65</sup> The subjectivity involved in self-identification was evident in the U.S. census, with 10 million Americans changing their reported race or ethnicity in a decade. Reported in *Time*, "Briefing," August 25, 2014.

it involves judgments about where to draw a line on the continuum of the distribution of income (or consumption), what time period to use, whether to look at individual or family outcomes, and whether to look at incomes before or after taxes and transfers. The results vary considerably depending on the region and even gender.

Given all these caveats, what emerges from a review of an array of definitions and data sources is that growth in middle-class incomes in Canada have not kept pace with growth in higher incomes over the past three decades. Most of this shortfall originated in the portion of the middle class with below-average human capital and incomes. This was evident in income tax data, household surveys of incomes and data on net worth. That the same trend appears in such diverse data sources reinforces the strength of this conclusion. It is also noteworthy that some of the erosion in most measures of the middle class reflects shifts into higher-income groups — notably professionals in business and public services — nearly as much as it does movement down. Presumably, moving up the income scale is not an outcome society wants to discourage. As well, rapid income gains by upper-income earners reduced the share of income available to the middle class.

The largest source of downward pressure on middle-class incomes was in the manufacturing industry. It is not clear what governments can do about this, since it is related to long-term forces of globalization and rapid technological change. Manufacturing jobs helped lay the foundation for the middle class, with its rapid growth after the Second World War, followed by the rapid expansion of the public service in the 1960s and '70s. This does not mean that manufacturing and government caused the growth of the middle class, since this confuses the manifestations of the growth of the middle class with its source. The rapid increase in human capital, from more education of the rapidly growing baby boomers and more skills acquired during the war, was the ultimate source of the postwar growth of the middle class. It was factories at first, and then government, that acted to hire people with more human capital, but that demand did not and could not create it.

The contrast between the gains made by middle-class professionals with above-average skills and incomes and the losses in the middle class for those with below-average skills and incomes suggests it may be worthwhile for research to explore reviving the distinction between the middle class and the working class that existed a century ago. Broad claims that the whole middle class is in crisis, provoking unjustified anxiety among many of the vast majority of Canadians who self-identify as middle class, ignores that large portions of it have prospered. It also distracts from focusing on the very real erosion of incomes and wealth for low-wage factory employment and low-skill services.

The implications for government tax and transfer programs are also unclear. Already, there has been a marked increase in net transfers to the middle-income groups. These increased net transfers have offset about half the erosion of middle-class incomes in the marketplace, financed both through higher tax payments by the high-income groups and lower transfer payments received by the low-income groups. If this erosion of income shares of the middle-income groups continues, governments will have to decide whether a 50 per cent offset is about right, not enough or too much. If governments want to increase financial support for the middle-income groups, they will have to decide which groups will fund it. Compounding this is the fact that the middle-income group, even with its erosion in recent decades, remains large enough that any programs designed to increase net transfers to it will be quite costly. In the absence of evidence of a generalized crisis in the middle class, particularly the large segments tied to the public sector, the best policy to support the broadly defined middle class are those that generate good macroeconomic performance, encourage continued high rates of human capital formation and reduce barriers to mobility within social classes and between regions. It is also worth emphasizing that there has been no large shift of middle-class workers to the lower class; most low income in Canada remains a transitory state.

## APPENDIX: STATISTICAL ISSUES INVOLVED IN MEASURING REAL INCOMES

Data problems are like birth pains: no one wants to hear about them, people just want to see the baby. However, in grappling with a question as nebulous as the fortunes of the middle class, where so many data sources are available, some discussion of the quality of the data is unavoidable. We covered the main problem of different trends from survey and tax data in the main text. In this appendix, we address some other issues about income data and its deflation.

Household survey data understate incomes for two main reasons. First, households underreport incomes either to protect their privacy or because they do not report the receipt of government benefits, such as employment insurance, pensions, and workers' compensation. The reasons for this range from the respondent simply wanting to reduce the burden of the interview or not recalling the receipt of a benefit, to discomfort with the stigma of program participation.<sup>66</sup> Of course, each survey has different strengths and weaknesses: SLID has a lower response rate than does the census (73.3 versus 97.0 per cent), but the census requires more imputations for income non-response (9.3 versus 2.7 per cent).<sup>67</sup> Census income data has the same drawback of being "self-reported and, thus, liable to contain more measurement error than tax data."<sup>68</sup>

As well, some sources of income are excluded from surveys, which focus mostly on regular and recurring sources of income. The definition of income in survey data excludes capital gains and losses, stock options, inheritances, receipts from the sale of personal assets, withdrawals from registered savings plans, and lump-sum settlements of insurance policies. Some of these sources are included in the definition of taxable income, notably stock options and capital gains and losses. Taxable incomes also include in-kind benefits, such as personal use of an auto supplied by the employer (worth \$848 million in 2009), employer-provided room and board (\$481 million), travel paid by the employer (\$479 million) and other minor benefits.

However, some sources of income that will be reflected in consumption and wealth statistics are simply not available in any income data. The SLID data used to calculate income distribution routinely misses the five per cent of taxpayers who file late. The definition of taxable income ignores a wide range of health benefits paid by some employers; in the federal government, this includes eyewear, prescription drugs, medical tests not covered by provincial health-care plans, physiotherapy and chiropractor services. This benefit grows as the population ages. Finally, income earned from illegal activities or the underground economy are not reported in tax data (but some appears in survey data, especially for consumption, since respondents have no incentive to conceal what they purchase).

More generally, none of the data on incomes adjusts for the non-cash transfers of health and education benefits that most people receive. These include the value of the subsidy that students and their parents receive from government-provided education, and the subsidy that all people receive from free health care. As well, other in-kind benefits, such as the value of owner-occupied housing and child care, should be included. Since payments of rents are included in the data on personal incomes and surveys of household income, the argument is that the implicit rent that households who own their homes are collecting from themselves should also be included. A study by Statistics Canada found that the imputed value of these in-kind benefits (excluding child care) exceeded 10 per cent of GDP and 22 per cent of labour income.<sup>69</sup>

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<sup>66</sup> For an excellent summary of these issues, see Bruce Meyer, Wallace Mok and James Sullivan, "The Under-Reporting of Transfers in Household Surveys: Its Nature and Consequences," NBER Working Paper 15181 (July 2009).

<sup>67</sup> Statistics Canada, "Comparing Income," 27.

<sup>68</sup> Frenette, Green and Milligan, "The tale," 6. Frenette is an analyst at Statistics Canada.

<sup>69</sup> Grant Cameron and Michael Wolfson, "Missing Transfers: Adjusting Household Incomes for Noncash Benefits," Statistics Canada (prepared for the Twenty-third General Conference of the International Association for Research in Income and Wealth, St. Andrews, New Brunswick, August 21–27, 1994).

More importantly, the overall distribution of the benefits from health care, education and owner-occupied housing was strongly progressive. The disposable income of the lowest-income quintile was boosted 47.0 per cent, the middle three quintiles by around 20 per cent, and the highest-income quintile by 13.0 per cent. This reflects how many of the benefits of subsidized or free education accrue to younger families with relatively low incomes (especially those headed by single parents), while health benefits accrue to the elderly, who often have below-average incomes. In terms of income shares by quintile, the share of the lowest quintile rises by 1.3 points and the highest quintile falls by 2.2 points after these benefits are taken into consideration.<sup>70</sup> However, it is unknown whether this distribution has changed over time, as Statistics Canada has not updated the results since the 1990s.

Nor are all benefits quantifiable. Public-sector workers have markedly greater job security than do workers in the private sector. Another non-pecuniary benefit is safer working conditions. Since almost all public-sector workers are in the middle class and their share of employment has been trending up, these benefits have been growing over time, but they cannot be quantified in the data on middle-class incomes. Other forms of non-pecuniary compensation include flexible hours or the option of working from home. Other benefits, such as counting one year of work as two years of pensionable service, are also not captured in data on income.

A further consideration is determining what price index to use for deflating incomes to account for price changes over time. By default, almost all studies use the CPI. However, there are reasons to believe the CPI has an upward bias when measured over long periods of time. This is because the CPI is slow to adjust for consumers substituting lower-priced products for higher-priced ones when prices are rising. The most recent informed estimate for Canada is that this bias averages 0.6 per cent a year.<sup>71</sup> While of little significance on an annual basis, this bias becomes significant when looking at real incomes over decades, as is the case for the discussion of how the middle class is faring in absolute terms. A study for the Brookings Institution concluded that adjusting for the upward bias in the U.S., CPI “has an enormous effect on changes in poverty over long periods.”<sup>72</sup>

As well, the CPI only measures prices in Canada, while most households spend some portion of their money outside the country. This was particularly important during the explosion of cross-border shopping in the late 1980s and early 1990s, when consumers drove across the U.S. border to take advantage of a higher dollar and lower prices for many consumer products. Those in the middle class were the prime beneficiaries of this increased purchasing power since, unlike the poor, they had the time and resources to drive to the U.S. However, the cross-border shopping phenomenon subsided markedly after border security was increased following the 2001 terrorist attacks on the U.S.

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<sup>70</sup> *ibid.*

<sup>71</sup> Christopher Ragan, “Fixing Canada’s CPI: A Simple and Sensible Policy Change for Minister Flaherty,” C.D. Howe Institute e-brief (March 8, 2011). His estimate is close to the Bank of Canada’s 1992 estimate of a 0.5 per cent bias. See Allan Crawford, “Measurement Biases in the Canadian CPI: A Summary of the Evidence,” reprinted in “The Consumer Price Index,” Statistics Canada Catalogue No 62-001 (1992).

<sup>72</sup> Bruce Meyer and James Sullivan, “Dimensions of Progress: Poverty from the Great Society to the Great Recession” (conference draft presented at the Fall 2012 Brookings Panel on Economic Activity, Washington, D.C., September 13-14, 2012), 3.

Both these issues are partly addressed by using the implicit price index for personal expenditure, which allows for limited substitution at a high level of aggregation, such as between recreation and transportation but not within either of these categories, and makes an attempt to incorporate prices paid when travelling in other countries. Normally, the difference between the two is insignificant. However, when the exchange rate changes rapidly, such as it did after 2003, a noticeable gap can open up. Over the last decade, for example, the IPI rose five per cent less than the CPI.<sup>73</sup> This can have a significant impact on the perceived evolution of real incomes. Wherever possible, it is preferable to use the IPI when deflating incomes over long periods of time.

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<sup>73</sup> This is a lower-bound estimate of the amount the CPI overstates inflation over long periods of time. Taking account of quality improvements between 1970 and 1992 means “the inflation rate conventionally measured was overstated in the period by about 1 percent a year” according to Deirdre N. McCloskey, *Bourgeois Dignity: Why Economics Can't Explain the Modern World* (Chicago, Ill.: University of Chicago Press, 2010), 52. Other researchers find an even larger quality effect: see Jerry Hausman, “Sources of Bias and Solutions to Bias in the Consumer Price Index,” *Journal of Economic Perspectives* 17, 1 (Winter 2003): 38.

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