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ABSTRACT

Top Incomes in Canada: Evidence from the Census^{*}

This paper looks at the evolution of incomes at the top of the distribution in Canada. Master files of the Canadian Census are used to study the composition of top income earners between 1981 and 2011. Our main finding is that, as in the United States, executives and individuals working in the financial and business services sectors are the two most important groups driving the growth in top incomes in Canada. A finding more specific to Canada is that the oil and gas sector has also played an important role in income growth at the top, especially in more recent years. Another arguably Canadian-specific finding is that holders of medical degrees have lost ground compared to other top income earners. Finally, despite the IT revolution, scientists, engineers and even computer scientists do not account for much of the growth in top incomes in Canada.

JEL Classification: D31, D33, F66, G30, H24

Keywords: income inequality, top incomes, labour's share, executive compensation, rent extraction

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I. INTRODUCTION

After a long period of relative stability in the postwar period, the Canadian earnings and income distribution has changed substantially over the past several decades. One of the most striking developments has been the dramatic rise in incomes at the very top of the income distribution (Saez and Veall, 2005; Veall, 2012). At the same, real earnings have fallen at the bottom of the distribution, and showed little growth in the middle of the distribution, especially among men (Green and Sand, 2014). As a consequence, earnings and income inequality have increased, a development that has received much public as well as scholarly interest (Fortin, Green, Lemieux, Milligan and Riddell, 2012; Veall, 2012). Other noteworthy changes in the wage structure since the early 1980s include some widening of earnings differences by educational attainment, substantial growth in earnings gaps by age, and narrowing of gender earnings differentials (Boudarbat, Lemieux and Riddell (2010), among others).

The dramatic increase in top incomes has received substantial attention. However, much remains to be learned about top earners and how the characteristics of this group have evolved over time. Are they mainly employees or owners of businesses? How important to their high incomes is labour earnings relative to income from other sources such as investments? What industries and occupations do they work in, and how have these changed over time? What about other personal and demographic characteristics such as gender, educational attainment and province and city of residence?

The purpose of this study is to use master files from the Canadian Census to better understand the factors behind the dramatic increase in top earnings since the early 1980s. There are a number of competing explanations for the increase in inequality in Canada and other countries like the United States and United Kingdom.¹ Studies that look at the whole earnings distribution have generally focused on explanations linked to technological change, globalization, and labour market institutions. Some of these explanations have direct implications for top-end earnings. For instance, if technological

¹ Alvaredo and Piketty (2008) show a sharp divergence between “English-speaking” countries where inequality and top income shares have increased rapidly since about 1980, and other countries like France or Japan where the income distribution has remained much more stable. This is a major puzzle that we don’t try to address in this paper.

change affects the earnings distribution through a change in the skill premium, highly educated workers at the upper end of the distribution should have experienced more growth in earnings than less educated workers.² Likewise, top-earners performing highly skilled tasks that are hard to offshore should do better in terms of earnings than those performing routine tasks that can easily be offshored, or replaced by computers.

By contrast, explanations for inequality growth based on changes in labour market institutions may not play an important role at the top end of the distribution. For instance, changes in the minimum wage have been shown to be an important determinant of inequality at the bottom end of the distribution (DiNardo, Fortin, and Lemieux, 1996; Lee, 1999; Fortin and Lemieux, 2014), but they are unlikely to play much of a role at the upper end of the distribution. De-unionization is also an important explanation for the increase in earnings inequality among men (Card, Lemieux, and Riddell, 2004), but since very few top earners are unionized it is not a very promising explanation for the changes in inequality observed at the top end. Note however, that occupational licensing and professional organizations of highly skilled workers can be viewed as a related form of unionization that may be playing a more important role than traditional unions at the top end.³ This could help account for changes in earnings of specific top-end occupations such as medical doctors.

In addition to these general explanations for changes in inequality over the whole distribution, a number of factors more specific to the very top end have also been discussed in the literature. For instance, a number of studies have looked at the role of changes in “the way CEOs are paid” as a potential explanation for the phenomenal growth in their earnings over the last few decades.

In a standard competitive model, CEOs, like other workers, are simply paid their marginal product, i.e. their addition to the firm’s value. Some authors like Gabaix and Landier (2008) and Gabaix, Landier and Sauvagnat (2013) have argued that a

² See Acemoglu and Autor (2011) for a detailed discussion of the role of technological change in wage inequality. Following Autor, Levy, and Murnane (2003), Acemoglu and Autor discuss the implications of “routine-biased” technological change relative to the more traditional skill-biased technological change approach. In both cases, however, highly educated workers should experience wage gains relative to less-educated workers.

³ Kleiner and Krueger (2013) show that in the United States there are now over 30 percent of workers in who work in occupations that require a professional license. This far exceeds the fraction of the workforce covered by traditional collective bargaining agreements.

market/competitive model of CEO pay could explain the observed growth in compensation. Other authors are more sceptical. For instance, both Bebchuk and Fried (2004) and Bertrand and Mullainathan (2001) dispute the conventional view that executives are “paid for performance”. They instead argue that CEOs are much more likely to be directly or indirectly “setting their own pay” relative to other workers. In other words, they are in a better position to extract economic rents than the rest of the workforce.⁴

In addition to CEOs, Kaplan and Rauh (2010) suggest that the finance sector has also played an important role in the growth in earnings at the top end. But unlike CEOs of large publicly-traded firms for whom detailed compensation data has to be disclosed, the income of most top earners in investment banks, private-equity firms and hedge funds is not publically available. Based on some limited data Kaplan and Rauh (2010) argue that the finance sector played an important role in the growth of top income shares, but the evidence on this is limited.⁵

Dramatic growth in top incomes may also reflect the phenomenon of “superstars” as formalized in a famous paper by Rosen (1981). Although we expect earnings of “superstars” to exceed those of “stars,” the magnitude of the premium depends on the size of the market. In some circumstances small differences in the skills of certain individuals may get magnified incredibly if there is a large market for the products of their services, i.e. when the service or product can be provided to a large audience (or group of customers) that can share the cost. In these circumstances, the “best person” may command a superstar salary that is astronomical relative to the “next-best” person, even though the superstar’s ability or skill may be only marginally better than the next-best person. The recent “decline of distance” and associated globalization of economic activity may have dramatically increased the market size for some labour services, resulting in the increased incidence of “superstar” salaries.

⁴ Economic rents refer to payments to a factor of production in excess of opportunity cost or “transfer earnings” – the amount a factor of production must earn to prevent its transfer to an alternative use. In the case of labour, rents are earnings in excess of what the worker could earn in her next best alternative employment opportunity.

⁵ See also Bajika, Cole, and Heim (2010) who use data on occupations based on income tax statements, and Statistics Canada (2013) for information on the occupational distribution of top earners in the 2011 NHS data.

More generally, the debate around the growth of top earnings has revolved around two broad classes of explanations. These positions are nicely articulated in a recent *Journal of Economic Perspectives* symposium on the “top one percent”. Proponents of the market-based view such as Kaplan and Rauh (2013) argue that the growth in top earnings is a broad-based phenomenon linked to the increasing demand for the unique skills and abilities of top earners linked to technological change, globalization, scale effects, etc. On the other side of the debate, Bivens and Mishel (2013) propose an explanation linked to the increased ability of top earners to extract rents that are pervasive in the labour market. Decreases in marginal tax rates on earned income may also have raised the incentive to receive remuneration in the form of earnings rather than other forms of compensation.

These two classes of explanations are closely connected to the above-mentioned debate about the source of growth in executive compensation. They also mirror the more general and older debate about the sources of growth in overall inequality. Influential early studies such as Katz and Murphy (1992) or Juhn, Murphy and Pierce (1993) use a broad-based market view where the growth in inequality is mostly linked to an increase in the return to skill. By contrast, Freeman (1993), Card (1992, 2001) and DiNardo, Fortin and Lemieux (1996) look at the contribution of de-unionization where the main mechanism for changing inequality is the increasing inability of workers in the middle of the distribution to extract rents through collective bargaining agreements.

The debate between these two classes of explanations is also highly policy relevant. If a portion of earnings consists of rents, these can be “taxed away” without affecting the allocation of labour to various uses. If on the other hand these high earnings represent an increase in the return to skills or talent, taxing this income could result in a loss of talent to other uses (and perhaps other countries).

If one had good measures of skills, rents, and ability to appropriate these rents, it would be straightforward to determine which of these explanations are behind the growth in top earnings. Short of this, good proxies for skills (education, experience, field of study) and job characteristics (industry, occupation, firm size) can be used to see how well they do at explaining the growth in top earnings. Finding that earnings growth is mostly concentrated among highly educated workers in science, technology, engineering,

and mathematics (STEM) regardless of industry (i.e. either Google or hedge funds) would be more supportive of the market/skills view. In contrast, finding that the growth in top earnings was limited to few industries (say finance) and occupations (say CEOs), could lead one to conclude that rent extraction is the key factor behind the growth in top earnings, especially if (as is argued by Bivens and Mishel, 2013) evidence consistent with rent extraction exists in these industries and occupations.

Most of the research on the evolution of top incomes has used administrative data on taxfilers (e.g. Saez and Veall, 2005; Finnie and Irvine, 2006; Murphy, Roberts and Wolfson, 2007; Murphy, Michaud and Wolfson, 2008; Veall, 2012). Although taxfiler data has important advantages, they also have disadvantages. In particular, these data contain relatively few socio-demographic characteristics. Thus basic information such as the role of educational attainment and occupation in the rise of top incomes remains to be investigated. Unlike most other data sets available for studying top earners, the master files of the Canadian Census contain detailed information on education, field of study (since 1986), occupation, industry and a number of other important socio-economic characteristics. This allows us to shed considerable light on the factors behind the growth in top earnings in Canada since 1980.

The paper proceeds as follows. After introducing the census master file data in Section 2, we show in Section 3 that the main trends in top incomes in the census data are generally consistent with what has been found using tax data. We then present a detailed analysis of the role of education, occupation, industry, and other worker and job characteristics in the growth in top incomes in Section 4, and conclude in Section 5.

II. CENSUS DATA

In this paper we use master file (MF) data from the Canadian Census over the period 1981 – 2006.⁶ These data have a number of important advantages. First, as noted previously, the responses to the “long form” Census questionnaire provide detailed information on a number of important socio-demographic characteristics, including gender, industry of employment, occupation, education and immigrant status, as well as

⁶ We also report some results from the 2011 National Household Survey, as discussed below.

annual earnings and work experience during the previous year. The information on educational attainment is particularly detailed, and includes years of completed schooling (except in 2006), all diplomas, certificates and degrees obtained, and field of study (starting in 1986). Most of this information has been collected on a consistent basis over the 1981 to 2006 period. A second important advantage is the large sample size – 20% of the Canadian population. The large sample size is particularly important for studying a small group like the top 1% of income earners. The combination of these two features means that we are able to investigate the characteristics of narrowly defined sub-groups within the top 1% such as medical doctors or those with degrees in finance and accounting. A third important advantage of the MF data is the absence of top coding (which occurs when observations above a certain level are censored for confidentiality reasons).⁷

Much previous research into aspects of Canada’s wage structure – such as returns to education and experience, male-female earnings differences, and earnings differences between immigrants and the native born – uses public use (PU) Census data. Indeed, in some research areas such as that of immigrant earnings, the Census has been the “work horse” source of micro-data. Similarly, Boudarbat, Lemieux and Riddell (2010) argue that the Census is the best source of information for studying the evolution of returns to education over time in Canada. However, although the PU data have the advantage of being widely available to researchers, they are not suitable for investigating top income earners because of their relatively limited sample sizes and because these data are top-coded.⁸ During a period in which the overall earnings distribution is relatively stable, top-coding may not affect conclusions about the evolution of the wage structure. However, in a period in which there is a dramatic rise in incomes at the very top of the distribution – as has been the case in Canada during the past three decades – there is considerable risk

⁷ For example, if the data are top-coded at incomes in excess of \$225,000 then all individuals with income greater than \$225,000 are simply reported as earning \$225,000.

⁸ The Census is also much less affected by non-reporting of earnings and other information at the bottom of the income distribution, a problem that has been identified in the other surveys such as the Survey of Consumer Finances (Frenette, Green and Picot, 2006).

that the combination of top coding in the PU Census files and dramatic increases in top incomes may result in incorrect conclusions about changes in the wage structure.⁹

Unfortunately, two important changes introduced in the 2006 Census create some comparability problems with the 1981-2001 data. First, respondents who are required to complete the “long form” (Form 2b) of the Census are now given the opportunity of allowing Statistics Canada access to their income tax records instead of self-reporting the income items as was the case with earlier Censuses. Over 80 percent of respondents in the 2006 Census did permit access to their tax records (Statistics Canada, 2008). As a result, the information on income and earnings is not strictly comparable to previous Census data.¹⁰

Second, the information on educational attainment was simplified in 2006 relative to the 1981-2001 Censuses. While it was possible to precisely identify the number of years of schooling in the earlier Censuses, the only information available in the 2006 Census is the highest diploma or degree obtained. This limits the number of educational categories that can be used in our empirical analysis.¹¹ For example, starting in 2006 all workers without any certificate or diploma are pooled in the same educational category, regardless of whether they have one or eleven years of schooling. We are nonetheless able to construct six education categories that are consistently defined over time. These categories are: *i*) less than a high school diploma, *ii*) high school diploma, *iii*) post-secondary degree or diploma below a university bachelor’s degree (including trade

⁹ For example, a substantial majority of top earners are men (Fortin et. al. 2012). As top incomes have grown over time, the fraction of male observations that are censored has increased relative to the fraction of female observations that are censored. Use of PU data may thus yield incorrect conclusions about the evolution of the male-female earnings differential.

¹⁰ According to Statistics Canada (2008), comparability problems are significant for workers more marginally attached to the labour market. Since we focus on workers with a strong attachment to the labour market (full time workers and, in some cases, full-time/full-year workers), the comparability problems should not have much impact on our results. Brochu, Morin, and Billette (2013) also conclude that the change in income reporting introduced in 2006 most likely has an impact at the bottom of the distribution.

¹¹ Another consequence of the changes introduced in 2006 is that it is no longer possible to directly compute years of potential experience which is defined as age minus years of schooling minus six (the typical age when one starts school). As is well known, it is generally preferable to use potential experience instead of age to control for life-cycle effects in a standard Mincer earnings regression. Given these data limitations, we look at the role of age instead of experience in our analysis of top incomes.

certificates), *iv*) university bachelor's degree, *v*) professional degrees in medicine, dentistry, and veterinary medicine, and *vi*) post-graduate degree (Masters and PhD).

A new question about field of study (for post-secondary degrees only) was introduced in the Census in 1986. From 1986 to 2001, field of study was coded using the Major Field of Study (MFS) classification system. A new classification system (the Classification of Instructional Programs, or CIP) was then introduced in the 2006 Census. We explain in the data appendix how we have recoded the data to have a fairly consistent set of fields of study over the 1986-2006 period. We use a set of 10 major fields of study in our main analysis tables, and report supplemental evidence for 25 more detailed fields that contain a particularly large fraction of top income earners.

There have also been some changes over time in the classification system used for industry and occupation. As in the case of field of study, in the main analysis tables we present results for a limited set of industries and occupations that are consistently defined over time. We also present more detailed results for industries and occupations in which top earners tend to be concentrated. The data appendix provides detailed information on how the industry and occupation classifications were harmonized over time.

In 2011 the mandatory Census 'long form' was replaced by the voluntary National Household Survey (NHS). In order to provide the most recent available information, we report NHS results in our main tables. However, because of the voluntary nature of the NHS, substantial caution needs to be exercised in comparing Census and NHS data.

III. TRENDS IN INEQUALITY AND TOP INCOMES: CENSUS AND TAX DATA

In this section we first report basic trends in top incomes using the data compiled by Veall (2012) using data from Statistics Canada's Longitudinal Administrative Databank (LAD), which is based on income tax data. We then show that these trends are quite comparable to those obtained using Census data. This suggests that even though income data are self reported in the Census (until 2006), there do not appear to be significant reporting biases that would make the Census of questionable validity for studying the evolution of top incomes in Canada.

A. Trends based on tax data

As is well known, tax data show a large increase in top income shares in Canada since the early 1980s (Saez and Veall, 2005; Veall, 2012). Figure 1 reproduces the trend in the top 1 percent and top 0.1 percent computed by Veall (2012) using data from the LAD.¹² The top 1 percent income share grew from less than 8 percent in the early 1980s to close to 14 percent in 2006-07, before declining slightly during the recession of 2008-09. Note that while the LAD data only starts in 1982, data from tax reports used in Saez and Veall (2005) indicate that top income shares were relatively stable in the 1970s and early 1980s. The sharp growth in these shares starting in the mid-1980s is, therefore, a major departure relative to earlier trends.

Figure 1 shows that the top 0.1 percent income share grew even more dramatically since the early 1980s. It more than doubled from around 2 percent in the early 1980s to around 5 percent in recent years. Put in other terms, this indicates that the income of the top 0.1 percent (1 tax filer out of a 1000) went from 20 times average income to 50 times average incomes over a period of about 20 years.

These dramatic trends are illustrated in a different way in Figure 2a that shows real growth in income at different points of the distribution. This is once again based on Veall (2012) using data from the LAD. Figure 2a shows that average incomes in Canada increased by 13.5 percent between 1982 and 2010. But the rest of the figure shows that these gains are very unevenly spread across the distribution. In particular, average incomes for individuals below the top 10 percent (i.e. the “bottom 90 percent”) were essentially stagnant as they only grew by about 2 percentage points over the 28-year period. This corresponds to less than 0.1 percent real income growth per year, which is negligible.¹³

¹² This information about top incomes in Canada (and the United States in some later graphs) was downloaded from the World Top Income Database (Alvaredo, Atkinson, Piketty, and Saez, 2014) on January 28 2014. In the case of Canada the data were provided by Michael Veall using the LAD (from 1982 to 2010) and tax data records dating back to early in the 20th century. The income concept is ‘market income’ which includes all income except government transfers and capital gains.

¹³ Annualized growth rates are reported in Figure 2b, discussed below.

As we move up the distribution real income gains become larger and larger and reach 160 percent for the top 0.01 percent of the distribution (Figure 2a), or close to 6 percent per year (Figure 2b). But although the growth at the top is very large, it is not quite as large as in the United States. Figure 2b compares annualized growth rates in Canada and the United States. In both countries, the incomes of the “bottom 90 percent” show no growth whatsoever over time. Higher up in the distribution, income growth is systematically larger in the United States than in Canada. It is more than twice as high by the time we reach the very top of the distribution.

Although the available data indicates significant Canada – US differences in the growth of top incomes, these apparent differences may reflect differences and changes in how income is reported in the two countries (Veall, 2012). In particular, in both Canada and the US there have been changes in incorporation laws (and their administration) that influence whether income earned by professionals (such as doctors, dentists and lawyers) flows through to personal income reported for tax purposes. The extent to which these changes in incorporation laws and practices can account for differential growth in reported top incomes is an open question.¹⁴ In addition, in Canada the change introduced in the 2006 Census that allowed individuals to choose to permit access to their tax returns rather than self-report their income may have played a role. It is unclear what an incorporated individual would answer on the Census income question prior to tax-based reporting.

Figure 2c suggests that differences in income growth at the very top may have to do with the fact Canada does not quite have the upper tail of very top earners that is observed in the United States. Instead of comparing U.S. and Canadian income growth by fractiles (99 to 99.9 percent, 99.9 to 99.99 percent, etc.), Figure 2c plots income growth

¹⁴ For example, the 1986 reform in the United States led to a substantial amount of income being transferred from C corporations (income that does not flow through to the personal income tax system) to S corporations whose income does flow through to personal income tax (Slemrod, 2000; Veall, 2012)). This change is the main cause of the 1986 spike in measured top incomes in the US, and suggests that Canadian top income levels would be higher if incomes reported by Canadian Controlled Private Corporations, or CCPCs (equivalent to C corporations in the US), were reported as personal income for tax purposes. In addition, in Canada there has been an increased propensity over this time period for doctors, lawyers and dentists to form companies, in part because legal prohibitions that restricted at least some kinds of professional income from being reported as corporate income for tax purposes were lifted during the 1990s and 2000s.

as a fraction of average income in each fractile. Interestingly, the figure shows that points for Canada and the United States line up well except at the very top of the distribution (99.9 to 99.99 and especially the top 0.01 percent). In other words, individuals with similar incomes in the two countries experienced fairly similar income growth between 1982 and 2010. But since there are not quite as many people (relative to population) with extremely high incomes in Canada and the United States, fractile-based comparisons at the top tends to contrast people with substantially different levels of incomes in the two countries. For example, average income of the top 0.01 percent was over \$10 million in the US, more than double that of Canada's counterpart, which makes the difference in average annual growth rates (15 percent in the US versus less than 5 percent in Canada) even more striking. This factor appears to account for most of the difference in the growth in top incomes in the two countries.

Another way of illustrating the consequences of the increasing concentration of income in Canada is to look at the evolution of different measures of the labour share of total income, in particular with and without including top earners in labour's share.¹⁵ Figure 3 shows that after hovering around 65 percent until the mid-1990s, the labour share has declined precipitously to reach only about 60 percent in recent years.¹⁶ Although the labour share has also declined in most other industrialized countries (Karabarounis and Neiman, 2013), this is a dramatic change since the labour share in Canada had been stable at around two-thirds for decades.

The decline in the labour share is even more dramatic when the top 1 percent of earners is excluded from the share of income going to labour. The adjusted share now goes from a peak of 62 percent in the early 1990s to only 54 percent in recent years. Fitting a linear trend to the data indicates that the labour share declined by 0.17 percentage points a year between 1982 and 2008. The rate of decline almost doubles to 0.30 percent once we remove the top 1 percent from the labour share.

While these yearly percentage changes look small, they correspond to large numbers since the size of the total pie (Canada's GDP) is now approaching 2 trillion dollars. The 0.17 percent annual decline in the labour share means that, year after year,

¹⁵ Labour share refers to the fraction of national income received by workers, the remainder going to capital.

¹⁶ The labour share was downloaded from the OECD website.

3.2 billion dollars go from labour to capital. A further 2.5 billion a year moves from the “bottom 99 percent” of workers to the top 1 percent. This adds up to 5.2 billion dollars annually moving from the bottom 99 percent to the top one percent and capital, equivalent to about \$230 annually for each of 23 million Canadian workers as of 1995, the middle of our sample period. This dramatically illustrates how large the distribution effects linked to growing inequality in Canada have been over the last few decades.

B. Comparing census and tax data

As we noted in Section II, all the income data in the long-form Census were self-reported until 2001. Starting in 2006 Statistics Canada gave respondents the option of instead allowing access to their tax return, and over 80 percent of individuals agreed to share their income tax information to reduce response burden. One concern with self-reported income is that it may systematically understate incomes at the very top. For instance, Bound and Krueger (1991) find evidence of mean reversion in self-reported income. They compare administrative income data (from the U.S. Social Security administration) to self-reported income (from the Current Population Survey) for the same individuals, and find that high-income individuals tend to underreport their income, while low-income do the opposite. However, Bound and Krueger (1991) did not look explicitly at the case of top earners. Using the confidential (and non top coded) version of the March CPS, Burkhauser et al (2012) conclude that trends in top income based on self-reported data are quite similar to those obtained using administrative tax data.

Frenette, Green, and Picot (2006) compare trends in inequality and average income by vingtiles in Canada using a variety of data sets. Their findings suggest that Census and tax data show similar income trends, except perhaps at the bottom of the distribution. Milligan (2013) reaches a similar conclusion in the case of top income shares. In Figures 4a and 4b, we explicitly compare the income cut-offs and income shares computed from the master files for the Census (reported in Milligan 2013) to those from the LAD (reported in Veall 2012).

The income cut-offs for the 95th and 99th percentiles in the two data sources are remarkably similar. The cut-offs from the LAD are slightly higher than those from the Census, but in most cases the gap is less than 5 percent. In the case of the cut-off at the 99.9th percentile, there is a more substantial gap between the two data sources. The

income cut-offs are systematically larger in the LAD, and the gap relative to the Census grows until 2001 when it reaches close to 25 percent. The cut-offs get much closer in 2006, however, suggesting that the introduction of the option to allow use of income tax information in the Census makes the two data sources more comparable.¹⁷

The income shares reported in Figure 4b are also relatively similar in the two data sources. As in the case of the income cut-offs, there is more of a gap at the very top end though the difference between the two data sources declines substantially in 2006. We conclude from the examination of these trends that the Census provides very accurate information on top end incomes that is quite close to that obtained using tax data (LAD). There is more of a difference between the two sources at the very top end (99th percentile) but this gap has narrowed substantially with the recent introduction of tax-based reporting.

IV. DETAILED EXAMINATION OF TOP INCOMES USING CENSUS AND NHS DATA

We now take advantage of the rich features of the Census and NHS to look at detailed characteristics of top earners. The main contribution of the paper is to show how the composition of top earners has changed over time, and which groups have experienced the most income growth.

Existing Canadian studies have looked at the characteristics of top earners at a given point in time. In contrast, our primary focus is on the evolution of the characteristics of this group over time. Using Census data for 2006, Fortin et al. (2012) show that there is a fair amount of diversity among top earners. The largest groups of top earners are executives, doctors (including dentists and veterinarians) and individuals working in the financial sector. Fortin et al. (2012) also show that top earners are much more highly educated than average, and are overwhelmingly men. More recent data from the 2011 NHS (Statistics Canada, 2013) confirms that top earners are more educated than

¹⁷ Brochu, Morin, and Billette (2013) look at differences in the income distribution between Census respondents who did and did not consent to share their income tax data with Statistics Canada. They find that the bottom end of the distribution is more affected by response issues than the top end.

average. The NHS data also indicate that the majority of top earners come from only three fields of study: business, health, and engineering.

To the best of our knowledge, however, no existing studies have attempted to document the evolution over time of the composition of top earners using the detailed information on education, occupation, industry, etc. available in the Census. In the United States, Bajika, Cole, and Heim (2010) use information about occupations available in income tax statements to look at trends in the composition (and average income) of top earners by occupation. While it is unclear to what extent the information on occupation reported on income tax returns is accurate, Bajika, Cole, and Heim (2010) show a number of interesting trends in the composition of US top earners. In particular, they find that most individuals in the top 0.1 percent are executives, managers, supervisors, and financial professionals. Individuals in these occupations also account for 70 percent of the growth in the share of national income earned by the top 0.1 percent between 1979 and 2005. This group also accounts for close to 50 percent of the top 1 percent of earners. The main reasons for the difference between the fraction of executives, managers, supervisors, and financial professionals in the top 1 and 0.1 percent is that a large number of medical doctors are in the top 1 percent (MDs account for 15 to 20 percent of the top 1 percent depending on the year), but few MDs make it into the top 0.1 percent.

Our main results are reported in Tables 1 and 2. The analysis sample includes all individuals age 15 and above with positive incomes. Table 1a provides a detailed description of the characteristics of top earners (those with income in the top one percent of the distribution) in each of the six censuses (1981 to 2006) and the 2011 NHS. As a benchmark, we also report the distribution of characteristics for all individuals with positive incomes in Table 1b. Table 2a then presents the average income of top earners as a function of the different characteristics reported Table 1, while Table 2b does the same for all income earners.

Tables 1 and 2 provide two different, but related ways of looking at the sources of growth in top earnings over time. Holding the fraction of all income earners in a given group or sector (e.g. finance) constant over time, if that group experiences unusual growth in income at the top, we should see an increase the fraction of all top income earners (e.g. in the top one percent) who are in that sector. In other words, we will

conclude that a given group contributes positively to the growth in incomes at the top if the fraction of top earners in that group (Table 1a) increases faster than the fraction of all income earners in that same group (Table 1b). Likewise, we would reach the same conclusion if average incomes in the group, conditional on being in the top one percent, were also shown to be increasing relative to other groups or sectors. As we will see in the results presented below, both approaches for looking at sources of growth in incomes at the top yield relatively similar answers.

In our examination of the evolution of top incomes we focus on Census data as these are collected on a consistent basis over time. NHS results are included in the tables, and occasionally discussed in the text. However, because the two data sources cannot reliably be compared, little attention is given to the NHS results.

Since there is a lot of information reported in the tables, we have added a summary table at the end of the paper that reports the most salient results from Table 1a and 1b. Readers may want to consult this summary table instead of the detailed tables we are about to discuss.

In the summary table and the Appendix tables (discussed later) we also report the ratio of top earners to all earners for each category at the beginning and end of the sample period. These “relative proportions” enable the reader to easily see which groups are under-represented or over-represented among top earners, and how the extent of under- or over-representation changed over time.¹⁸

The first row of Table 1a shows the income cut-off for the top one percent of the income distribution. Consistent with the evidence reported in Figure 4a, the cut-off increases steadily over time (in constant 2000 dollars) to reach about 154,000 in the 2006 census and 160,000 in 2011. Table 1a also shows that labour earnings are by far the largest source of income of individuals in the top one percent.¹⁹ On average, labour earnings represent over 80 percent of the income of individuals in the top one percent,

¹⁸ For example, as shown in the summary table, the relative proportion of men among top earners was 1.7 in 1981 and 1.6 in 2011, indicating that men are substantially over-represented among top earners and the extent of over-representation declined modestly from about 70% in 1981 to about 60% in 2011.

¹⁹ Labour earnings include both wage and salary earnings and self-employment income. Note that studies based on tax data (e.g. Saez and Veall, 2005) also indicate that labour earnings account for most of the income of top income earners.

which is substantially higher than the corresponding figure for all individuals (Table 1b). Furthermore, earnings as a fraction of income of people at the top have been relatively constant over time. This clearly indicates that explanations for the growth in earnings at the top have to focus on the role of labour earnings, as opposed to other income sources like investment income.

A related set of results on hours of work is reported in the following rows of Table 1a. The results indicate that individuals in the top one percent tend to work substantially longer hours than the rest of the workforce. For instance, conditional on working, hours of work of top earners are stable around 48 to 49 hours compared to 38 to 39 hours for all workers. Furthermore, there is a much higher share of individuals at the top who work more than 50 hours a week, and this fraction has increased from 46 percent in 1981 to 54 percent in 2006.²⁰ This is consistent with Kuhn and Lozano (2008) who find that, in the United States, high wage workers have been increasingly likely to work long hours (more than 48 hours a week in their case).

The next set of results in Table 1a show the role of standard demographic characteristics (gender, education, and age) in the probability of being in the top one percent. The most dramatic finding is that an overwhelming fraction of top earners are men. This fraction steadily declines over time, but remains extremely high (over 80 percent) in 2006 and 2011. The downward trend is not surprising since the gender wage gap has also been declining over time (Baker and Drolet, 2010). The very small fraction of women at the top is nonetheless consistent with the existence of a glass ceiling that makes it hard for women to access high-paying jobs.²¹

Education also plays a very important role in the probability of being a top income earner. Even in 2006, only 19 percent of all income earners (see Table 1b) had a bachelor's degree or more (including professional and graduate degrees). This fraction was even lower (less than 10 percent) in 1981. By contrast, in 2006 65 percent of top income earners have at least a bachelor's degree, rising to 68 percent in 2011. In other words, individuals in the top 1 percent are more than three times as likely to hold at least

²⁰ The large decline in this fraction to 30% in 2011 is puzzling, and we can only speculate about the reasons for the discrepancy with previous data.

²¹ See Albrecht, Bjorklund and Vroman (2003) for evidence on the glass ceiling hypothesis, and Bertrand, Goldin and Katz (2010) for recent evidence on the gender gap among MBA graduates.

a bachelor's degree than typical individuals. The importance of higher education has also grown over time. Back in 1981, 44 percent of top earners had a least a bachelor's degree, which is about 20 percentage points less than in 2006. The growing role of higher education in top earnings is consistent with Boudarbat, Lemieux, and Riddell (2010) who show that returns to higher education have steadily increased in Canada since 1981.

Among individuals with at least a bachelor's degree, those with a medical degree (including degrees in dentistry and veterinary medicine) are particularly likely to be part of the top one percent. Table 1a indicates that around 12 percent of these individuals are part of the top one percent in 2006, despite the fact they represent only about 0.5 percent of the population (Table 1b). Note, however, that the share of top income earners who have a medical degree has been declining steadily over time despite the fact they represent a slightly growing share of all income earners (Table 1b). This suggests that over time medical doctors have lost ground relative to other top earners, perhaps because their earnings depend more on government policies than on market forces. The fact that the downward trend stopped after 2001 is also consistent with the large federal re-investments in health care that started around year 2000.²² The role of government policies rather than market forces in influencing salaries of doctors and dentists is also consistent with U.S. evidence. In the US, where governments play a smaller role in determining these salaries there does not appear to indicate a similar decline in the fraction of medical doctors at the top of the distribution (Bajika, Cole, and Heim, 2010).

We next show that the probability of being in the top one percent depends on age. Not surprisingly, very few individuals under the age of 35 (less than 5 percent in 2006) are part of the top one percent. This is as expected since it is well known that earnings grow rapidly as a function of age until about age 40. Furthermore, the fraction of top earners under age 35 has declined steadily over time. Table 1b shows that this reflects in part changing demographics as the fraction of young people in the population has also declined over time (aging of the baby boom cohort). But the share of young top earners

²² Federal health and social transfers to provinces decreased during most of the 1990s to reach \$12.5 billion in 1998-1999. Transfers increased steadily to \$22.3 billion in 2003-04 and have grown dramatically since then following the Health Accord of 2004. Health transfers are now part of a separate program (the Canada Health Transfer, or CHT) that has grown from \$15.3 billion in 2004-05 to \$32.1 billion in 2014-15. See Department of Finance (2014) for more detail.

declined to a greater extent than would be expected on the basis of demographic trends, which is consistent with a well-documented decline in the relative earnings of young workers starting in the early 1980s.²³

While the information about medical degrees is available in the main census question about educational attainment (highest degree or diploma), detailed information on other fields of study is only available starting in 1986. We look at ten broad fields of study in Table 1 and present more detailed breakdowns in Appendix Table 1. The most noticeable trend in Table 1a is the growing importance of commerce/business degrees among top earners, which mainly reflects the general growth in this type of degree in the whole population (Table 1b).²⁴ Another noticeable trend is the declining importance of health degrees among top earners, which is consistent with the evidence for medical degrees discussed above.

A comparison of Tables 1a and 1b also indicates that holders of degrees in pure and applied science are more likely to be part of the top one percent than most other degree holders. For instance, individuals with degrees in engineering and applied science represent 9 (10) percent of top earners in 2006 (2011), but only 2.8 (3.0) percent of all income earners. That said, the fraction of top earners with science degrees has only increased slightly over time, suggesting this is not the main group behind the growth of top incomes in Canada. However, the aggregate number reported in Table 1 hides some interesting developments among more finely defined groups of degree holders. In particular, Appendix Table 1 shows that the share of top earners with degrees in computer science (and applied mathematics) has increased dramatically over time. Computer scientists only accounted for about 0.2 percent of top earners in 1986, compared to 1.6 percent in 2001. Appendix Table 1 also shows that the fraction of top earners with computer science degrees has grown much faster than the fraction of these individuals among all income earners that increased from 0.2 percent in 1986 to 0.5 percent in 2001. Nonetheless, despite this substantial growth in percentage terms, those with degrees in computer science made up less than 2% of top earners in 2001.

²³ See Beaudry and Green (2000) and Boudarbat, Lemieux and Riddell (2010).

²⁴ The over-representation of this group declined by a modest amount from 4.2 to 4.0 over the 1981 to 2001 period.

It is difficult to compare fields of study in 2006 to those in earlier years because of a major change in the classification system used (from the MFS to the CIP classification) for coding of field of study. Appendix Table 1 nonetheless shows that the fraction of computer scientists among all income earners kept growing after 2001 (from 0.5 percent in 2001 to 0.7 percent in 2006) while the fraction among top earners declined precipitously (from 1.6 percent in 2001 to 0.9 percent in 2006). This suggests that the 1986 to 2001 growth in the fraction of top income earners with computer science degrees was mostly a transitory phenomenon linked to IT boom (and bust) of the 1990s. When taking the longer view (up to 2006 and 2011), the growth in the IT sector does not appear to be a major factor in the growth of incomes at the top end.

We next look at the industry composition of top earners.²⁵ The main finding about industry composition is the growth in the fraction of top earners working in business services and the finance and insurance sector. The fraction of top income earners working in business services (management consulting, law and accounting firms, etc.) increased from 12 to 19 percent between 1981 and 2006. The increase in finance and insurance was even more dramatic, as the fraction of top earners working in this sector doubled from 5.4 percent in 1981 to 10.8 percent in 2006. This dramatic change happened despite the fact the fraction of all income earners in this sector remained constant at around 3 percent (Table 1b) between 1981 and 2006. By contrast, the fraction of all income earners in business services doubled from 3.4 to 6.7 percent between 1981 and 2006, indicating that the growth in top earners in business services is a composition effect linked to the growth of the sector. The NHS data indicate that this growth continued in the latter half of the 2000s. These results clearly indicate that the financial sector played an important role in the growth of top earnings in Canada, just as it did in the United States (e.g. Bajika, Cole, and Heim, 2010).

²⁵ For 1981 to 2001 we are able to construct a consistent classification of major industries from the 1970 SIC (for 1981) and the 1980 SIC (for 1986-2001). We can also construct a consistent classification for 2001 and 2006 using the 1997 NAICS (for 2001) and 2002 NAICS (for 2006). These two sets of consistent classifications are reported in Appendix Table 2. In Table 1, the figures reported for 2006 are obtained by computing the 2001 to 2006 change from the consistent NAICS coding of industries, and adding it to the “closest” major industry aggregate for 2001 (based on the SIC classification). In most cases the industry aggregates based on SIC and NAICS are very close to each other, but the 2006 figures reported in Table 1 are nonetheless based on an approximation.

Another sector in which the fraction of top earners has increased rapidly in recent years is the oil and gas extraction (and mining) sector. The fraction of top income earners working in that sector almost doubled from 3 percent in 1981 to 5.7 percent in 2006 (and rose substantially further to 7.1% in 2011 according to the NHS), with most of the change happening in recent years. Not surprisingly, the fraction of top earners from Alberta (lower down in Table 1a) has also increased rapidly in recent years. 17 percent of top income earners lived in Alberta in 2006, which is much larger than the fraction of all income earners living in this province (10.3 percent in Table 1b). These findings are also consistent with Veall (2012) who shows that Alberta is the province that has experienced the fastest growth in the top income share in Canada.

The next set of results looks at the role of occupations. Because of major changes in the coding of occupations introduced in 1991, we only report results for 1991 to 2011 that are based on the SOC 1991 classification of occupations. Not surprisingly, executives (senior management) account for a disproportionate share of top income earners. For example, in 2006 16.8 percent of top earners were senior managers, despite the fact that this occupation only accounts for 0.9 percent of all income earners (Table 1b). More importantly, the fraction of top income earners in senior management occupations has increased over time, going from 13.7 percent in 1991 to 16.8 percent in 2006. Interestingly, all of the increase in the fraction of managers (of all levels) in the top one percent (from 35 to 38.5 percent) comes from senior management. Likewise, essentially all the growth in the broad business, finance, and administrative occupations (from 8.7 to 12.7 percent) comes from business and finance.

The only other occupation that has grown in importance among top earners is natural and applied science occupations (from 5 to 7.5 percent in 2006). Note, however, that the relative importance of this occupation has also grown among all income earners (from 3.6 to 4.8 percent in Table 1b). Furthermore, individuals in this occupation are about 50 percent more likely than average to be in the top 1 percent (e.g. 7.5 percentage points is about 50 percent higher than 4.8 percentage points). By contrast, individuals in business and finance are more than 3 times more likely than average to be at the top (9.1 vs. 2.7 percent in 2006). This figure is even higher among senior managers who are almost 20 times more likely than average to be at the top (16.8 vs. 0.9 percent in 2006).

On balance, our findings are similar to the trends for the United States, where the evidence indicates that top executives and finance specialists are the two most important groups behind the growth in incomes at the top (e.g. Bajika, Cole, and Heim, 2010, and Kaplan and Rauh, 2013).

The last set of results in Table 1a indicates how top income earners are distributed across provinces and cities. As we discussed above, a noticeable trend is the growth in the fraction of top income earners who live in Alberta. The fraction of top income earners living in Ontario also outpaced population growth in that province, going from 39 to 51 percent between 1981 and 2001, but declining somewhat during the next decade. This is again consistent with Veall (2012) who shows that, after Alberta, Ontario is the province that has experienced the fastest growth in its top income share. By contrast, the share of top income earners living in Quebec has declined faster (from 21 to 17 percent) than its population share. The share of top income earners also declined in British Columbia despite the fact its population share increased. The decline in the forest industry, as well as reductions in Canadian ownership (and thus loss of head offices) in this sector, may have contributed to the BC experience.

The results for major urban areas use the Census definition (Census Metropolitan Areas). Overall, top incomes are to an important extent an urban phenomenon – over 60% of top earners live in the 5 major cities (Table 1a), whereas almost 60 percent of the population live outside these large urban areas (Table 1b). The top 1 percent is over-represented in 4 of the 5 largest cities – the exception being Montreal where the fraction of top income earners is about the same as its share of the population. Looking at changes over time, the results for cities parallel those for provinces. The most noteworthy changes over time have been the increases in the fraction of top income earners in Toronto (from 20% to 28%) and (especially) Calgary, where the fraction of top earners almost doubled from 5% to over 10%, much larger than its share of Canada’s population.²⁶ More generally, the growth of incomes at the very top of the distribution is essentially an urban phenomenon – the fraction of the top 1% living outside the five major cities declined from 49% in 1981 to 39% (38%) in 2006 (2011) (Table 1a).

²⁶ In their analysis using tax data, Murphy and Veall (2013) show that more than one-half of the surge of the share of market income received by the top 1% in Canada is attributable to Calgary and Toronto.

Given the growing importance of senior managers in the top 1%, we show in Appendix Table 3 the industrial composition of senior managers among top earners and all earners over the 1991-2011 period. Among top earners, senior managers in business services grew substantially (from about 12% to 17%), but proportionately less than the growth of senior managers in business services among all earners – thus their relative proportion fell from 1.2 to 1.0. In contrast, in finance and insurance the 35 percent increase in senior managers among the top 1% was greater than the growth in senior managers in finance and insurance among all earners. This highlights the combined importance of the finance and insurance sector and CEOs and other senior managers in that sector in the growth of top incomes. The opposite trends hold for numerous other sectors – such as educational services and accommodation, food and beverage – that were characterized by decreases in the relative importance of senior managers but even larger declines in the representation of senior managers in the top 1% of earners.

Table 2a reports the average income of individuals in the top one percent. Consistent with the evidence from tax data (e.g. Figure 2a), the first row of the table indicates that average real income among all top income earners has increased substantially over time to reach \$342,000 in 2006 (in year 2000 dollars).²⁷ Comparing Tables 2a and 2b also indicates that the rate of income growth in average income for top earners has substantially outpaced the rate of growth for all income earners. This is again consistent with the evidence based on tax data reported in Figure 2a.

The detailed breakdowns by groups and sectors show that trends in average incomes at the top are closely connected to trends in the fraction of individuals at the top (Table 1a). For example, the average income of individuals with medical degrees declined relative to other top earners between 1981 and 2006. The average income of top income in this group was similar to the average for all top earners in 1981, but was 23

²⁷ There is a surprising and sizable drop in the average income of top earners in the 2011 NHS, despite the fact that the income cutoff grew between 2006 and 2011. This appears to be due to under-reporting of income among the very highest earners. Statistics Canada (2011) compares the number of individuals reporting income above certain levels (100,000, 200,000, 300,000, 500,000, 1,000,000) in the NHS and according to tax data (T1 file). The number of individuals reporting income above 100,000 and 200,000 is very similar in these two data sources, but the number of individuals reporting income above 1,000,000 is about 20% less in the NHS than in tax data. There are also fewer individuals reporting income above 300,000 and above 500,000 in the NHS.

percent below average in 2006. So both the fraction of top income earners who have medical degrees (Table 1a), and the evolution of their average incomes indicate that this particular group lost ground relative to other top income earners over time. Note also that, conditional on being in the top one percent, individuals with medical degrees are now one of the groups with the lowest average incomes. This likely reflects the compensation system for doctors, which is closely connected to government-set (or negotiated) reimbursement rates for different medical procedures. For all practical purposes, most medical doctors are paid something akin to piece rates, which essentially makes it impossible to earn the extremely high incomes of some top executives, investment bankers, etc.

Table 2a indeed shows that executives/managers and individuals in the financial sector earn substantially higher incomes than other top earners. Furthermore, the rate of growth in average income for these two groups is above the average for all top income earners. As a result, by 2006 top income earners in finance were earning 26 percent above the average for all top income earners. In other words, the situation of individuals working in the financial sector is exactly the opposite of those with medical degrees, as both their share among top earners and their average incomes have grown over time.

A similar picture emerges when we examine the growth of top earnings by major field of study over the 1986 to 2006 period (Table 2a). The largest increases occurred for Commerce, Management and Business administration (95%) and Mathematics, Computer and Physical Sciences (104%), two major fields that also grew as a fraction of top earners. In contrast, income among the top 1 percent whose field of study was in Health Professions increased by 40%, less than one-half as much.

V. CONCLUDING REMARKS

In this paper, we use detailed information from the master files of the 1981 to 2006 census and 2011 NHS to look at the evolution of top incomes in Canada. Like studies based on tax data, we find that incomes at the top have grown much faster than in the rest of the Canadian population. Census data also allows us to look at detailed characteristics of top income earners, and how these characteristics have changed over time.

A first important conclusion we reach is that, as in the United States, executives and individuals working in the financial and business services sectors are the two most important groups driving the growth in top incomes in Canada. A finding more specific to Canada is that the oil and gas sector has also played an important part in income growth at the top, especially in more recent years. A closely related finding is that Alberta now accounts for a disproportionate share of top income earners in Canada.

At the other end of the spectrum, individuals with medical degrees have generally lost ground relative to other top income earners. Average incomes have increased for this group, but not as fast as for other workers. Another important finding is that, given the prominent role of technological change in many explanations for the growth in top incomes, individuals with pure or applied science degrees, including computer scientists, have made substantial gains relative to other top income earners. However, these gains are smaller than those made by senior managers and those working in the financial and business services sectors. There are many more computer scientists at the top than 30 years ago, but this group still constitutes only a small fraction of top earners. In addition, the greater presence of computer scientists among top earners mostly reflects a general increase in the fraction of all income earners who hold computer science degrees.

What do these findings tell us about the role of market forces vs. rents that we discussed in the introduction? When comparing top executives and doctors, it is clear that “rents” or related institutional factors have to be at least part of the story for changes at the top. In Canada, the ability of doctors (as individuals or as a group) to extract rents chiefly depends on reimbursement rates that are negotiated with provincial health authorities. While there is an ongoing debate on the ability of top executives to extract rents (see the references in the introduction), it is difficult to believe that rents are not part of the explanation for why executives did much better than doctors in terms of top income growth in recent decades.

While technological change can affect earnings of different groups of workers in different ways, the results for scientists and computer scientists in particular suggest that this is only a modest part of the story for what happened at the very top of the distribution. If the IT revolution was the main driver of income growth at the very top, it

would be hard to believe that the group of IT specialists at the very core of this revolution would not represent a larger fraction of top income earners.

In the case of the oil and gas sector, market forces are surely playing a role in the growth in earnings in that sector, and in provinces (in particular Alberta) where this sector is most developed. It is not clear, however, why people at the very top should benefit more than the other income earners. Indeed, when looking below the top one percent, Fortin and Lemieux (2014) find that less-skilled workers benefited more from the extractive resources boom than more-skilled workers. Furthermore, Bertrand and Mullainathan (2001) use changes in oil prices as a prime example of why many CEOs appear to be paid for “luck” instead of performance. If CEOs were paid in a way that serves the interests of shareholders, they should be rewarded based on their effort and performance, as opposed to factors like world oil prices that are beyond their control. The fact that top incomes went up substantially in the oil and gas sector is consistent with a skimming model of pay setting (Bertrand and Mullainathan, 2001) where top executives are able to capture some of the large rent created by higher oil prices.

On balance, we think that our findings are more consistent with a rent-extraction story than a pure market-based explanation. It is important to stress, however, that the role of rents does not mean that top income earners are “rentiers” in the traditional sense of the word. Like the rest of the Canadian population, people at the top earn most of their income from work. If anything, work effort has increased over time, as evidenced by the growing share of top earners working more than 50 hours a week. So while some of the high incomes are surely a compensation for hard work, the growth in top incomes over time is just too large to be accounted for this factor alone.

REFERENCES

Albrecht, James, Anders Bjorklund and Susan Vroman (2003). "Is There a Glass Ceiling in Sweden?" *Journal of Labor Economics* 21 (January) 145-177.

Alvaredo, Facundo, Tony Atkinson, Thomas Piketty, and Emmanuel Saez (2014). *World Top Income Database* (<http://topincomes.g-mond.parisschoolofeconomics.eu/>)

Alvaredo, Facundo, and Thomas Piketty (2008), "The Dynamics of Income Concentration over the Twentieth Century: The Case of Advanced Economies", Paris School of Economics mimeo, November.

Acemoglu, Daron and David H. Autor (2011) "Skills, Tasks, and Technologies: Implications for Employment and Earnings," in O. Ashenfelter and D. Card, eds., *Handbook of Economics*, vol. IV.B, 1043-1172.

Autor, David H., Frank Levy and Richard J. Murnane. 2003. "The Skill Content of Recent Technological Change: An Empirical Exploration" *Quarterly Journal of Economics* 118 (November) 1279-1333.

Bajika, Jon, Adam Cole, and Bradley T. Heim (2010) Jobs and Income Growth of Top Earners and the Causes of Changing Income Inequality: Evidence from U.S. Tax Return Data, Williams College mimeo.

Baker, Michael, and Marie Drolet (2010). A New View of the Male/Female Pay Gap," *Canadian Public Policy* 36 (December) 429-464.

Beaudry, Paul, and David A. Green (2000) "Cohort patterns in Canadian earnings: assessing the role of skill premia in inequality trends," *Canadian Journal of Economics* 33 (November), 907-936.

Bebchuk, Lucian, and Jesse Fried (2004) *Pay without Performance: The Unfulfilled Promise of Executive Compensation*, Cambridge, MA: Harvard University Press.

Bertrand, Marianne, Claudia Goldin, and Lawrence F. Katz (2010) "Dynamics of the Gender Gap for Young Professionals in the Financial and Corporate Sectors," *American Economic Journal: Applied Economics*, 2(3): 228-55.

Bertrand, Marianne and Sendhil Mullainathan (2001) "Are CEOs Rewarded for Luck? The Ones without Principals Are," *Quarterly Journal of Economics*, 116 (3): 901-932.

Bivens, Josh and Lawrence Mishel (2013). "The Pay of Corporate Executives and Financial Professionals as Evidence of Rents in Top 1 Percent Incomes" *Journal of Economic Perspectives* 27 (Summer) 57-78.

Boudarbat, Brahim, Thomas Lemieux and W. Craig Riddell (2010). “The Evolution of the Returns to Human Capital in Canada, 1980-2005” *Canadian Public Policy* 36 (March) 63-89.

Bound, John, and Alan B. Krueger (1991) “The Extent of Measurement Error in Longitudinal Earnings Data: Do Two Wrongs Make a Right?” *Journal of Labor Economics* , Vol. 9, No. 1 (January) , pp. 1-24

Brochu, Pierre, Louis-Philippe Morin and Jean-Michel Billette (2013) “Opting or Not Opting to Share Income Tax Information with the Census: Does it Affect Research Findings?” forthcoming in *Canadian Public Policy*

Burkhauser, Richard V., Shuaizhang Feng, Stephen P. Jenkins, and Jeff Larrimore (2012), “Recent trends in top income shares in the United States: Reconciling estimates from March CPS and IRS tax return data,” *Review of Economics and Statistics*, Vol. 94, No. 2, pp. 371-388.

Card, David (1992). “The Effects of Unions on the Distribution of Wages: Redistribution or Relabelling?” NBER Working Paper 4195, Cambridge: Mass.: National Bureau of Economic Research.

Card, David (2001) “The Effect of Unions on Wage Inequality in the U.S. Labor Market.” *Industrial and Labor Relations Review* 54 (January): 296-315.

Card, David, Thomas Lemieux, and W. Craig Riddell (2004) “Unionization and Wage Inequality: A Comparative Study of the U.S., UK and Canada,” *Journal of Labor Research*, Vol. 25: 519-59.

Department of Finance (2014) *History of Health and Social Transfers* (<http://www.fin.gc.ca/fedprov/his-eng.asp>)

DiNardo, John, Nicole M. Fortin and Thomas Lemieux (1996) “Labor Market Institutions and the Distribution of Wages, 1973–1992: a Semiparametric Approach”, *Econometrica*, 64: 1001-1046

Dustmann, Christian, Johannes Ludsteck and Uta Schönberg (2009). “Revisiting the German Wage Structure” *Quarterly Journal of Economics* (May) 843-881.

Finnie, Ross, and Ian Irvine (2006) “Mobility and Gender at the Top Tail of the Earnings Distribution” *The Economic and Social Review, Economic and Social Studies*, vol. 37(2), pages 149-173.

Fortin, Nicole M., Sergio Firpo, and Thomas Lemieux (2009). “Unconditional Quantile Regressions”, *Econometrica* 77(3), May, 953-973.

- Fortin, Nicole M., David A. Green, Thomas Lemieux, Kevin Milligan and W. Craig Riddell (2012). "Canadian Inequality: Recent Developments and Policy Options" *Canadian Public Policy* 38 (June) 121-145.
- Fortin and Lemieux (2014). "Changes in Wage Inequality in Canada: An Interprovincial Perspective" mimeo, University of British Columbia, January.
- Freeman, Richard (1993). "How Much has Deunionization Contributed to the Rise of Male Earnings Inequality?" In Sheldon Danziger and Peter Gottschalk, eds. *Uneven Tides: Rising Income Inequality in America*. New York: Russell Sage Foundation, pp. 133-63.
- Frenette, Marc, David A. Green, and Garnett Picot (2006) "Rising Income Inequality in the 1990s: An Exploration of Three Data Sources," in D. Green and J. Kesselman (eds.), *Dimensions of Inequality in Canada*, UBC Press, pp. 269-306.
- Gabaix, X. and A. Landier (2008), "Why Has CEO Pay Increased So Much?", *Quarterly Journal of Economics* 123, pp. 49-100.
- Gabaix, X., A. Landier and G.L. Savagnat (2013). "CEO Pay and Firm Size: An Update after the Crisis" NBER Working Paper 19078, May.
- Green, David A. and Benjamin Sand (2014) "Has the Canadian Labour Market Polarized?" CLSRN Working Paper #133, April.
- Hubbard, William H.J. (2011). "The Phantom Gender Difference in the College Wage Premium" *Journal of Human Resources* 46 (Summer) 568-86.
- Juhn, Chinhui, Kevin M. Murphy and Brooks Pierce (1993), "Wage Inequality and the Rise in Returns to Skill", *Journal of Political Economy* 101, pp. 410-42.
- Kaplan, Steven N., and Joshua Rauh (2010). "Wall Street and Main Street: What Contributes to the Rise in the Highest Incomes?" *Review of Financial Studies* 23(3): 1004-1050.
- Kaplan and Rauh (2013). "It's the Market: The Broad-Based Rise in the Return to Top Talent" *Journal of Economic Perspectives* 27 (Summer) 35-56.
- Karabarbounis, Loukas, and Brent Neiman (2013) The Global Decline in the Labor Share, NBER Working Paper 19136, June.
- Katz, Lawrence F. and Kevin M. Murphy (1992). "Changes in Relative Wages 1963-1987: Supply and Demand Factors" *Quarterly Journal of Economics* 107 35-78.

- Kleiner and Krueger (2013). "Analyzing the Extent and Influence of Occupational Licensing on the Labor Market" *Journal of Labor Economics* 31 (April 2013) S173-S202.
- Kuhn, Peter J. and Lozano (2008) "The Expanding Workweek? Understanding Trends in Long Work Hours among U.S. Men, 1979-2006," *Journal of Labor Economics* 26 (April) 311-343.
- Lee, David S. (1999) "Wage Inequality in the United States during the 1980s: Rising Dispersion or Falling Minimum Wage?" *Quarterly Journal of Economics* 114: 977-1023.
- Lemieux, Thomas (2006). "Increasing Residual Wage Inequality: Composition Effects, Noisy Data, or Rising Demand for Skill?" *American Economic Review* 96(3) June, 461-98.
- Milligan, Kevin (2013) Income inequality in Canada: Trends in the Census 1980-2005 UBC working paper.
- Murphy, Brian, Paul Roberts and Michael Wolfson (2007). *A Profile of High Income Canadians*. Statistics Canada, Income Statistics Division, Income Research Paper Series.
- Murphy, Brian, Sylvie Michaud and Michael Wolfson (2008). "Income Trajectories of High Income Canadians, 1982-2005" mimeo, Statistics Canada.
- Murphy, Brian and Michael Veall (2013). "A Tale of Two Cities? The Surge in Top Incomes at the City Level in Canada. Mimeo, Statistics Canada and McMaster University.
- Rosen, Sherwin (1981). "The Economics of Superstars" *American Economic Review* 71 (December) 845-58.
- Saez, Emmanuel, and Michael Veall (2005), "The Evolution of High Incomes in Northern America: Lessons from Canadian Evidence" *American Economic Review* 95(3): 831-849.
- Slemrod, Joel, editor (2000). *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*. Cambridge: Cambridge University Press.
- Statistics Canada (2008) Income and Earnings Reference Guide, 2006 Census. Catalogue no. 97-563-GWE2006003, Ottawa.
- Statistics Canada (2011) Income Reference Guide, National Household Survey, 2011. Catalogue no. 99-014-XWE2011006, Ottawa.
- Statistics Canada (2013) Education and Occupation of High-Income Canadians, Ottawa, Catalogue No. 99-014-X2011003

Veall, Michael (2012). "Top Income Shares in Canada: Recent Trends and Policy Implications" Presidential Address, Canadian Economics Association, *Canadian Journal of Economics* 45 (November) 1247-1272.

DATA APPENDIX

In this appendix we explain how we reconcile the codes for major field of study and industry to obtain consistent classifications over time.

The census master files report the major field of study variable based on the Major Field of Study (MFS) classification from 1986 to 2001, and the Classification of Instructional Programs (CIP) in 2006. To take into account this change, we use the concordance between MFS and CIP downloaded from the Statistics Canada website,²⁸ and report the results at the major levels of the MFS. However, because the CIP has a more detailed classification than the MFS, there are 170 CIP categories with more than one MFS major level. To deal with those cases, we add an “overlapped” category, which includes individuals with a major field of study in one of these 170 categories.

Regarding industry, four different classifications are used in the Census master files over the years: the Standard Industry Classification 1970 (SIC-1970) for 1981, the SIC-1980 for 1986 to 2001, the North American Industry Classification System 1997 (NAICS-1997) for 2001, and the NAICS 2002 for 2006. Because SIC and NAICS have a similar structure at the major industry level, we group some NAICS categories to match the SIC categories and report the industry composition at the SIC major industry level.²⁹ Finally, to keep consistency over time in both the composition and averages of 2006, we compute the value of these variables in 2006 based on their level in 2001 (using SIC) and the changes from 2001 to 2006 computed using the grouped NAICS classification.

²⁸ <http://www.statcan.gc.ca/subjects-sujets/standard-norme/mfs-pde/mfscip-pdecpe-concstat-eng.htm>

²⁹ In particular, we group NAICS categories 51 and 22 into SIC’s “Communication and other utility” level; NAICS categories 54 to 56 into SIC’s “Business Services” level, and NAICS categories 71 and 81 into SIC’s “Other services” level.

Figure 1: Top income shares in Canada, 1982-2010 LAD

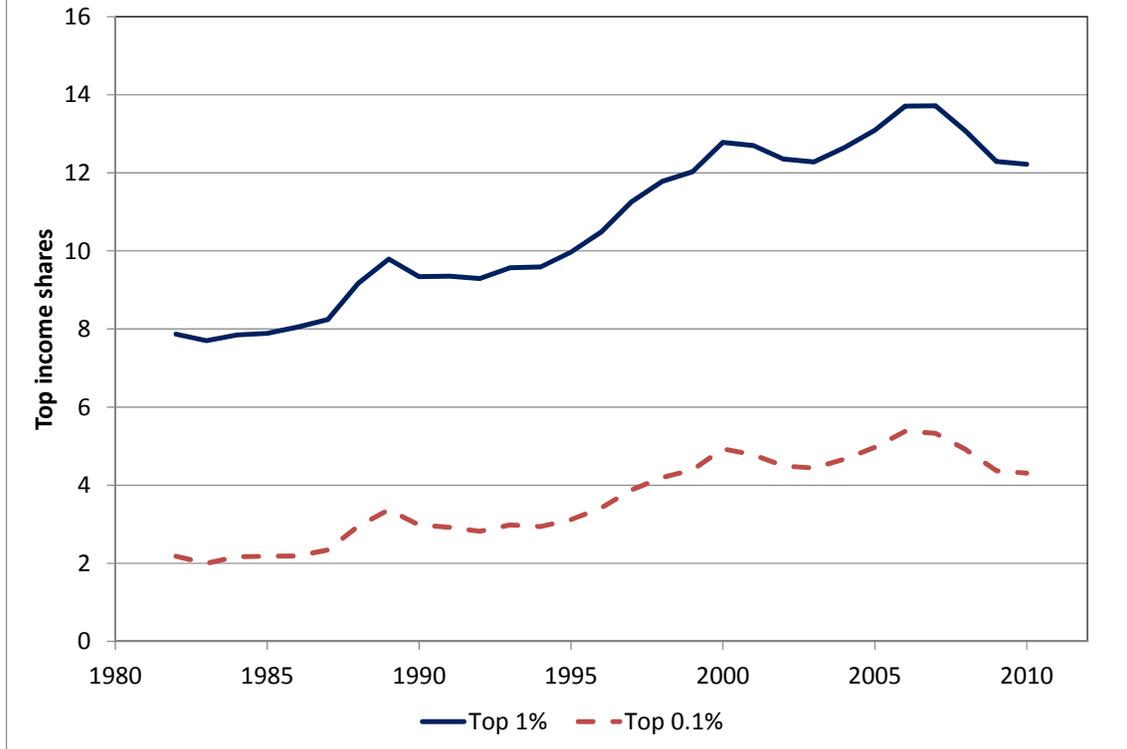


Figure 2a: Total Income Growth by Fractiles, 1982-2010

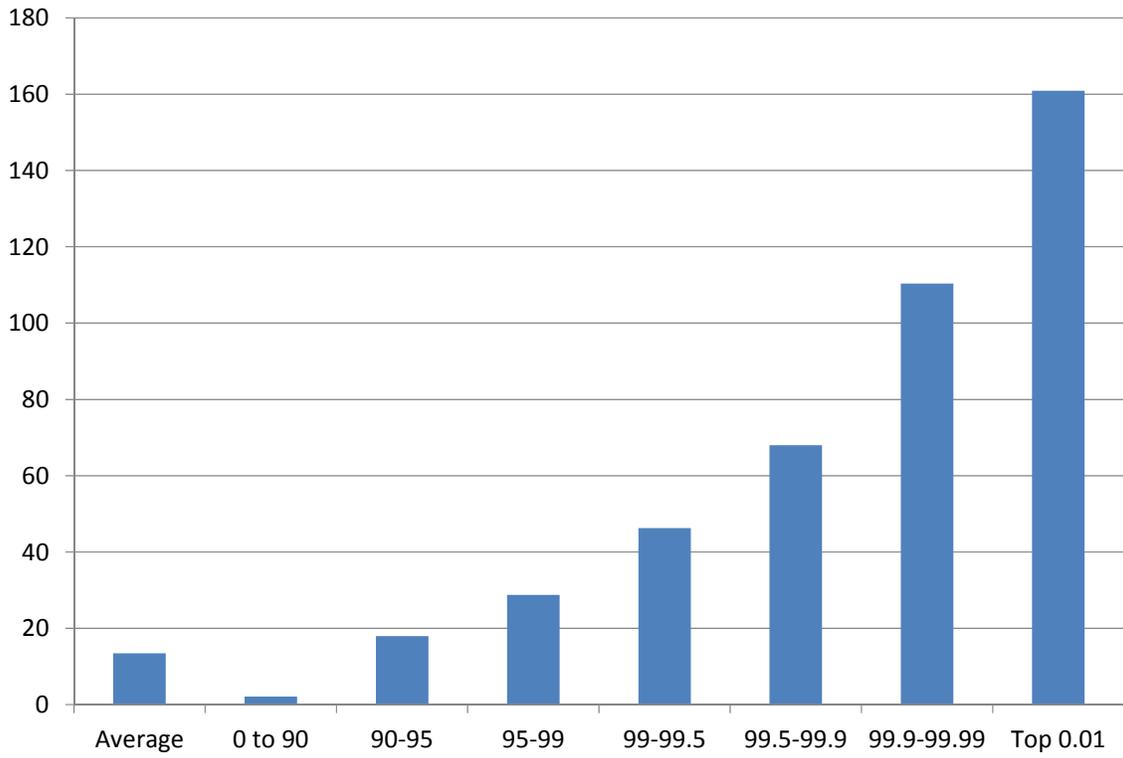


Figure 2b: Annualized income growth between 1982 and 2010, Canada and the United States

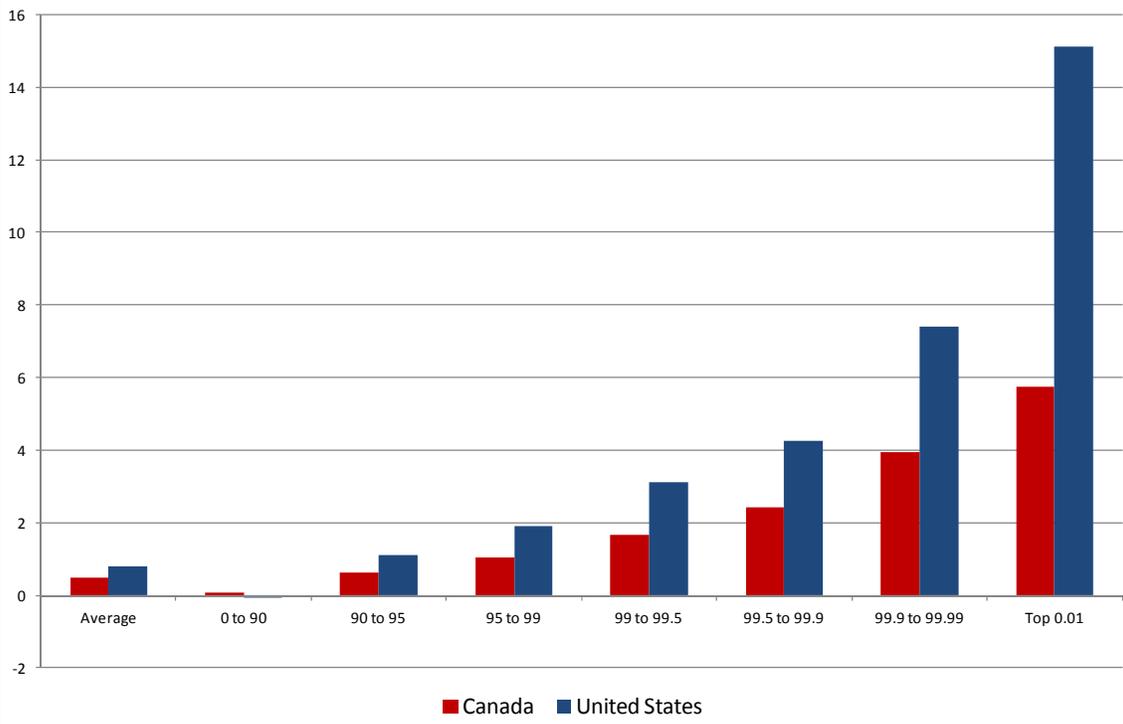


Figure 2c: Annualized income growth in Canada and the United as a function of average fractile income

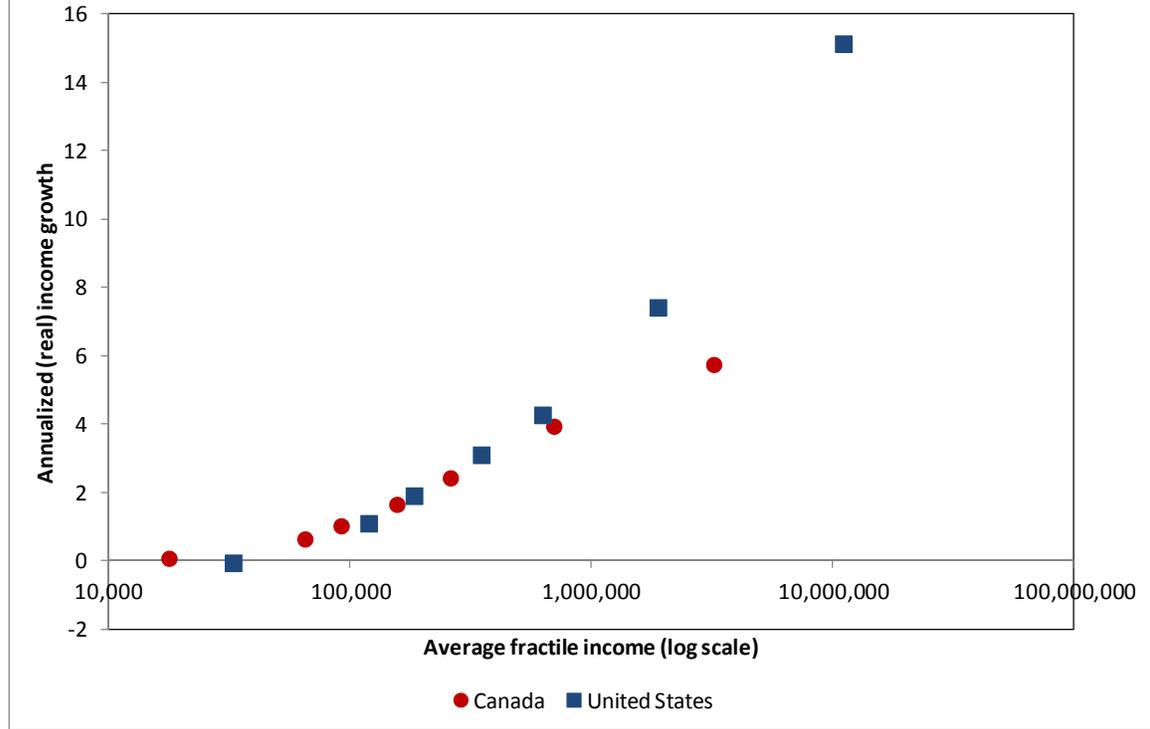


Figure 3: Labour share with and without the top 1%

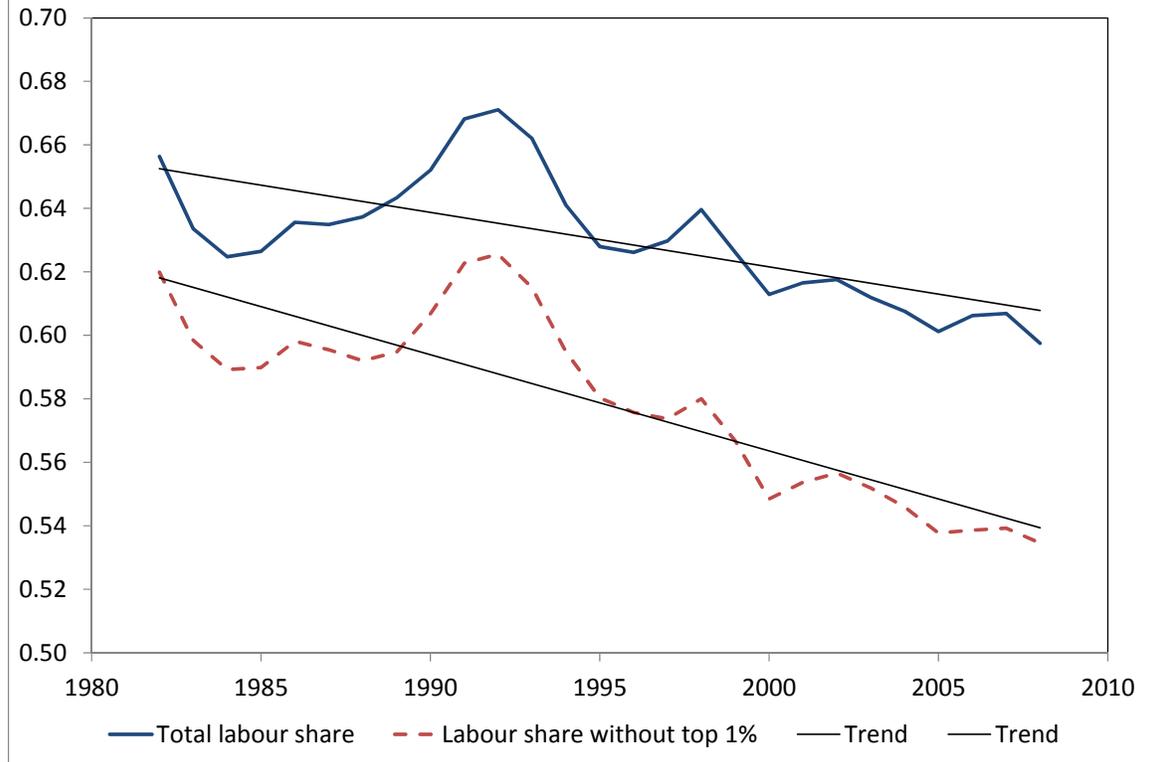


Figure 4a: Top income cutoffs: LAD vs. Census

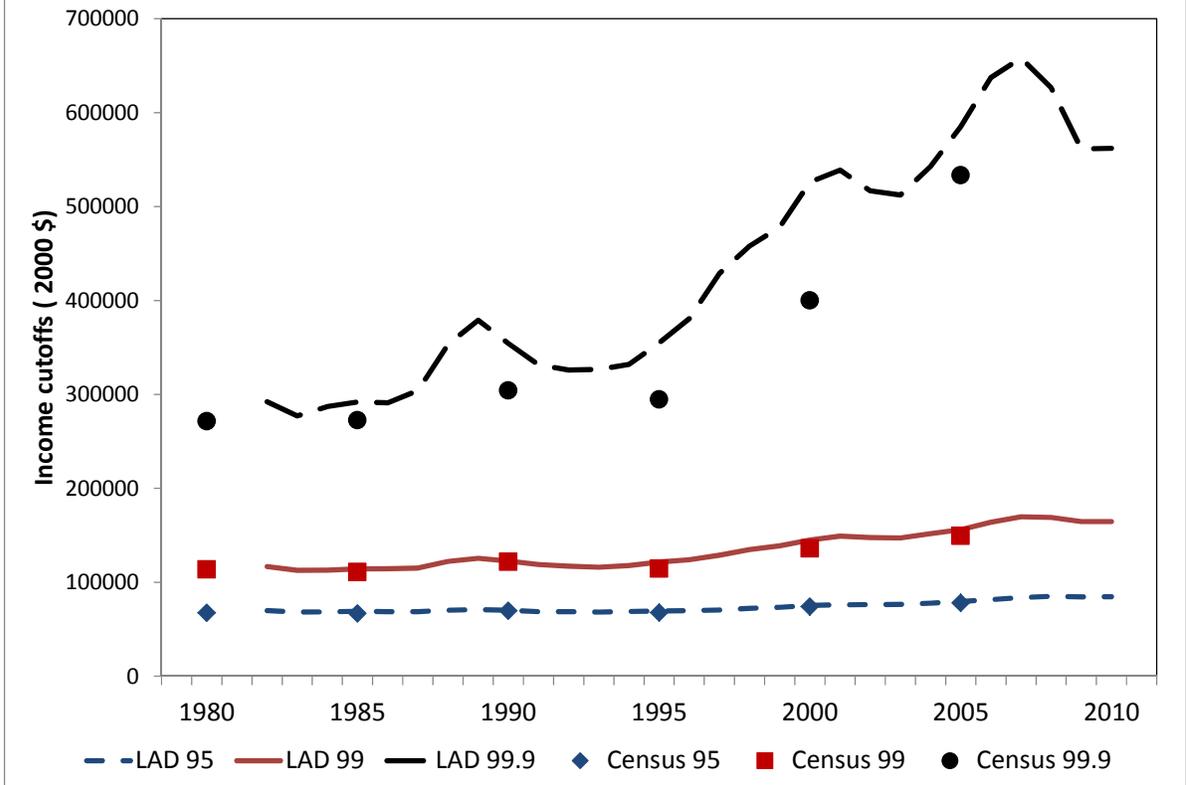


Figure 4b: Top income shares: LAD vs. Census

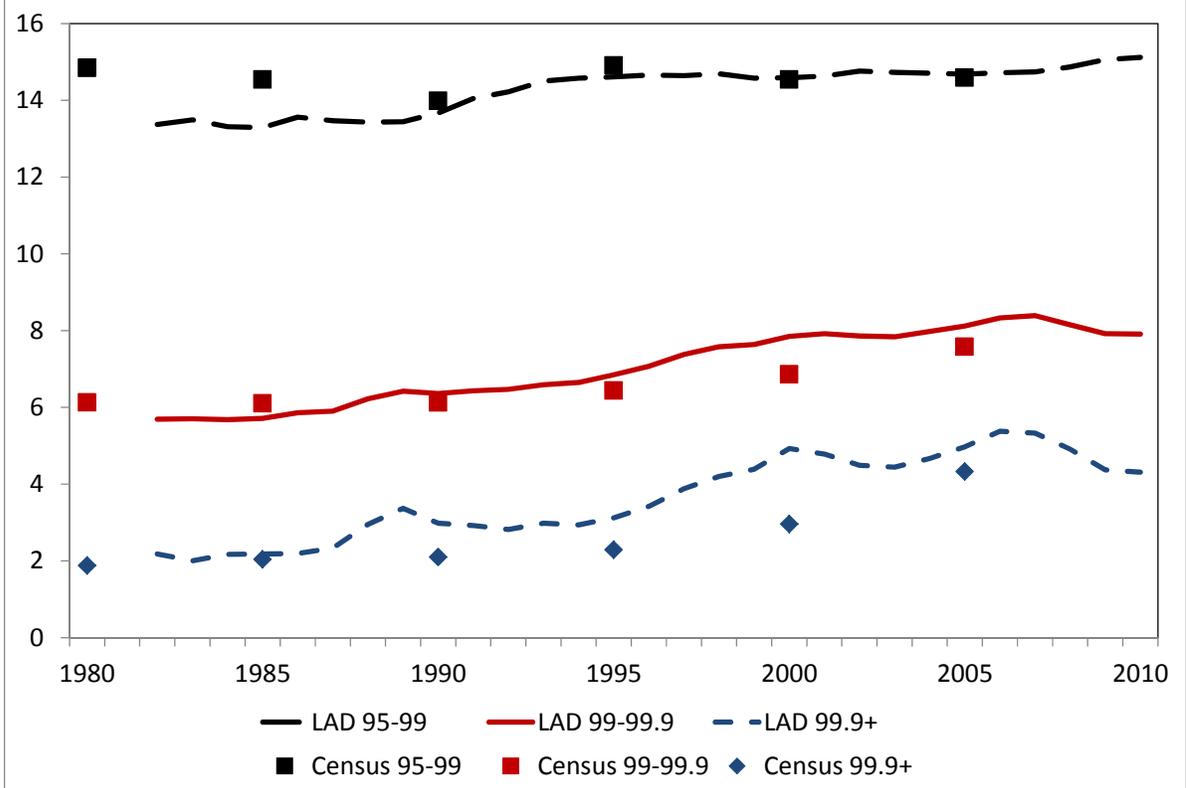


Table 1a: Characteristics of Top Income Earners (Top 1 Percent), 1981-2011

	1981	1986	1991	1996	2001	2006	2011
Income cutoff (2000 Dollars)	122,439	118,871	125,213	119,795	140,150	153,908	160,232
Work and earnings							
Positive hours of work	86.9%	87.1%	85.5%	86.7%	88.5%	87.8%	87.1%
Work 50+ hours a week (only workers)	46.5%	48.0%	46.9%	53.5%	52.7%	54.4%	39.6%
Average hours of work (only workers)	48.6	48.6	47.5	48.7	48.4	48.8	45.8
Fraction of income from earnings	80.1%	81.3%	81.2%	83.1%	85.5%	84.6%	82.0%
Men	91.5%	90.0%	86.5%	84.9%	83.1%	81.2%	79.7%
Education							
Less than a bachelor's degree	53.9%	46.7%	46.7%	40.9%	37.5%	35.4%	32.5%
Bachelor's degree	17.6%	21.3%	21.2%	24.6%	28.1%	29.5%	32.0%
Medicine, dentistry, veterinary	14.7%	15.8%	14.0%	14.2%	12.3%	12.1%	10.4%
Other graduate degrees	13.8%	16.2%	18.2%	20.4%	22.1%	22.9%	25.2%
Age groups							
Under 35	13.7%	10.9%	9.5%	7.8%	7.3%	4.8%	4.2%
35-64	76.5%	78.4%	77.7%	80.3%	83.0%	84.3%	83.7%
Over 64	9.8%	10.7%	12.8%	11.9%	9.7%	11.0%	12.1%
Major Field of Study							
Educational, Recreational and Counselling Services		1.5%	2.1%	2.3%	1.8%	1.7%	2.1%
Fine and Applied Arts		1.0%	1.2%	1.0%	1.1%	0.8%	0.8%
Humanities and Related Fields		2.5%	2.6%	3.0%	3.1%	2.3%	2.3%
Social Sciences and Related Fields		10.0%	11.7%	12.5%	12.8%	11.8%	12.2%
Commerce, Management and Business		16.2%	16.8%	20.2%	22.9%	24.7%	25.3%
Agricultural, Biological, Nutritional, and Food Sc.		1.6%	1.8%	1.8%	1.7%	1.3%	1.4%
Engineering and Applied Sciences		8.0%	7.5%	7.8%	8.9%	9.0%	10.3%
Applied Science Technologies and Trades		5.9%	7.0%	6.7%	7.5%	6.6%	7.6%
Health Professions and Related Technologies		19.3%	17.6%	18.1%	16.1%	16.6%	15.2%
Mathematics, Computer and Physical Sciences		3.2%	3.2%	4.1%	5.1%	3.0%	3.1%
No Specialization/No postsecondary educ.		30.7%	28.5%	22.4%	18.8%	16.7%	13.6%
Overlapped						5.4%	6.2%
Industry							
Agriculture, forestry, fishing and hunting	7.5%	5.0%	4.5%	2.9%	2.0%	1.4%	1.1%
Mining, quarry and oil & gas	3.0%	3.7%	2.5%	2.7%	2.9%	5.7%	7.1%
Manufacturing	11.9%	12.0%	10.7%	11.9%	11.5%	9.6%	7.7%
Construction	5.7%	4.3%	5.4%	3.4%	3.6%	4.2%	5.3%
Transportation and storage	4.5%	4.3%	3.9%	3.7%	3.4%	2.6%	2.4%
Communication and other utility	1.5%	1.9%	2.0%	2.2%	2.5%	2.1%	2.3%
Wholesale trade	7.0%	5.9%	5.4%	6.8%	7.3%	7.7%	7.0%
Retail trade	5.5%	5.0%	5.2%	3.9%	4.1%	4.3%	3.8%
Finance and insurance	5.4%	6.5%	6.7%	8.3%	10.2%	10.8%	11.0%
Real estate	4.8%	4.3%	4.2%	3.9%	3.9%	4.1%	3.9%
Business service	11.9%	13.6%	15.5%	16.7%	20.8%	19.0%	19.2%
Government service	3.4%	3.5%	3.7%	3.4%	2.2%	2.2%	3.5%
Educational service	3.2%	3.3%	3.2%	3.2%	1.9%	1.8%	3.1%
Health and social service	15.6%	17.3%	15.8%	16.4%	15.0%	15.2%	13.3%
Accommodation, food and beverage	1.4%	1.4%	1.3%	1.1%	1.1%	0.8%	0.8%
Other services	2.2%	2.8%	3.0%	3.1%	2.8%	2.6%	2.8%
Not applicable	5.5%	5.3%	6.8%	6.4%	4.8%	5.8%	5.6%

Table 1a (continuation)

	1981	1986	1991	1996	2001	2006	2011
Occupation (Based on SOC 91)							
Management			35.0%	34.8%	38.2%	38.5%	36.3%
Senior management			13.7%	13.6%	16.0%	16.8%	16.0%
Business, finance and administrative			8.7%	11.2%	11.7%	12.7%	13.0%
Business and finance			5.6%	7.7%	8.9%	9.1%	9.2%
Natural and applied sciences and related			5.0%	5.4%	7.8%	7.5%	9.2%
Health			15.8%	16.1%	14.6%	15.2%	13.8%
Social science, education, government service and religion			9.7%	9.7%	8.7%	9.0%	10.1%
Art, culture, recreation and sport			1.4%	1.5%	1.6%	1.0%	1.2%
Sales and service			7.6%	7.4%	6.2%	5.9%	4.9%
Trades, transport and equipment operators and related			5.0%	3.5%	3.5%	2.4%	3.4%
Occupations unique to primary industry			4.0%	2.6%	1.9%	1.5%	1.7%
Occupations unique to processing, manufacturing and utilities			0.9%	1.3%	1.0%	0.6%	0.7%
Not Applicable			6.8%	6.4%	4.8%	5.8%	5.6%
Industry - Senior Management only							
Agriculture, forestry, fishing and hunting			0.7%	1.0%	0.6%	0.7%	0.8%
Mining, quarry and oil & gas			3.8%	4.4%	3.7%	4.3%	4.9%
Manufacturing			25.6%	24.5%	20.8%	19.7%	15.6%
Construction			7.2%	4.9%	3.7%	5.4%	7.2%
Transportation and storage			3.4%	3.9%	3.4%	3.5%	3.4%
Communication and other utility			3.4%	3.6%	4.9%	3.9%	2.9%
Wholesale trade			12.0%	13.6%	12.0%	12.5%	12.4%
Retail trade			6.7%	4.9%	4.5%	4.4%	4.4%
Finance and insurance			10.2%	10.5%	13.2%	13.6%	14.0%
Real estate			3.2%	3.8%	3.9%	4.3%	4.6%
Business service			11.9%	12.9%	20.2%	17.1%	17.3%
Government service			4.5%	3.2%	1.9%	2.3%	3.2%
Educational service			0.7%	0.9%	0.7%	0.8%	1.0%
Health and social service			1.7%	2.5%	1.9%	1.7%	2.2%
Accommodation, food and beverage			1.7%	1.1%	1.0%	1.2%	1.3%
Other services			3.5%	4.1%	3.6%	4.5%	4.9%
Largest Central Metropolitan Areas							
Montreal	12.7%	12.4%	11.5%	11.9%	11.4%	11.2%	11.0%
Toronto	20.3%	25.6%	27.9%	27.4%	30.2%	28.6%	27.3%
Calgary	5.4%	5.9%	4.8%	5.6%	7.1%	9.4%	10.5%
Edmonton	4.0%	3.4%	2.7%	2.8%	3.2%	3.9%	5.1%
Vancouver	9.1%	8.1%	8.7%	9.3%	8.5%	8.3%	8.4%
Rest of Canada	48.6%	44.6%	44.4%	42.9%	39.7%	38.6%	37.7%
Province of residence							
Newfoundland and Labrador	0.8%	0.8%	0.8%	0.8%	0.7%	0.7%	0.9%
Nova Scotia	1.8%	2.2%	1.9%	1.9%	1.7%	1.5%	1.3%
New Brunswick	1.0%	1.3%	1.3%	1.3%	1.0%	0.9%	1.0%
Quebec	20.8%	19.4%	18.2%	17.8%	16.7%	16.7%	16.3%
Ontario	38.9%	45.2%	49.3%	48.1%	51.1%	47.1%	43.1%
Manitoba	3.2%	3.2%	2.7%	2.7%	2.3%	2.1%	1.9%
Saskatchewan	4.3%	3.4%	2.4%	2.3%	1.7%	1.7%	2.2%
Alberta	14.5%	12.4%	9.9%	10.9%	12.9%	17.0%	20.8%
British Columbia	14.4%	11.7%	13.0%	13.8%	11.5%	12.0%	11.9%
PEI/Yukon/NW Territories/Nunavut	0.4%	0.4%	0.5%	0.5%	0.3%	0.3%	0.4%
Population (000s)	157.2	170.7	193.5	213.0	227.3	244.2	259.2

Note: The sample consists of the top one percent of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Table 1b: Characteristics of all Income Earners, 1981-2011

	1981	1986	1991	1996	2001	2006	2011
Work and earnings							
Positive hours of work	64.6%	63.4%	62.6%	60.3%	61.6%	61.8%	60.3%
Work 50+ hours a week (only workers)	14.3%	15.8%	15.0%	17.7%	17.9%	18.2%	12.5%
Average hours of work (only workers)	39.1	39.1	38.3	38.1	38.8	39.0	37.6
Fraction of income from earnings	76.7%	69.9%	77.9%	62.7%	61.8%	63.0%	59.5%
Men	53.8%	52.3%	50.8%	50.3%	49.2%	48.9%	49.1%
Education							
Less than a bachelor's degree	90.9%	89.4%	87.9%	86.0%	84.0%	81.2%	78.4%
Bachelor's degree	5.9%	7.1%	7.9%	9.2%	10.5%	12.0%	13.8%
Medicine, dentistry, veterinary	0.4%	0.4%	0.5%	0.5%	0.5%	0.5%	0.6%
Other graduate degrees	2.8%	3.1%	3.7%	4.3%	5.0%	6.2%	7.2%
Age groups							
Under 35	44.9%	41.8%	38.8%	34.5%	31.4%	29.9%	29.4%
35-64	41.5%	43.8%	46.3%	49.9%	52.7%	53.7%	53.1%
Over 64	13.6%	14.4%	15.0%	15.6%	15.9%	16.5%	17.5%
Major Field of Study (Based on MFS classification, 1986 - 2006)							
Educational, Recreational and Counselling Services		3.5%	3.9%	4.5%	4.7%	4.4%	4.7%
Fine and Applied Arts		1.9%	2.1%	2.3%	2.5%	2.7%	2.8%
Humanities and Related Fields		2.2%	2.3%	2.6%	2.9%	2.7%	2.8%
Social Sciences and Related Fields		2.8%	3.3%	4.1%	4.5%	4.4%	4.8%
Commerce, Management and Business		7.7%	8.5%	9.3%	9.9%	10.5%	11.3%
Agricultural, Biological, Nutritional, and Food Sc.		1.7%	1.8%	2.0%	2.2%	1.9%	2.1%
Engineering and Applied Sciences		1.3%	1.5%	1.8%	2.1%	2.8%	3.0%
Applied Science Technologies and Trades		8.5%	9.1%	9.5%	9.8%	10.0%	10.3%
Health Professions and Related Technologies		3.9%	4.4%	4.7%	5.0%	5.8%	6.6%
Mathematics, Computer and Physical Sciences		1.1%	1.2%	1.4%	1.7%	0.8%	0.9%
No Specialization/No postsecondary educ.		65.4%	61.9%	57.9%	54.7%	48.0%	44.4%
Overlapped						6.0%	6.5%
Industry							
Agriculture, forestry, fishing and hunting	4.2%	4.1%	3.7%	3.3%	2.9%	2.4%	2.0%
Mining, quarry and oil & gas	1.4%	1.2%	1.0%	0.8%	0.8%	1.0%	1.1%
Manufacturing	15.3%	13.5%	11.4%	10.4%	10.4%	8.9%	6.8%
Construction	5.2%	4.7%	5.1%	4.2%	4.3%	4.9%	5.2%
Transportation and storage	3.8%	3.5%	3.2%	3.0%	3.1%	3.0%	2.9%
Communication and other utility	2.6%	2.5%	2.6%	2.2%	2.1%	2.0%	2.0%
Wholesale trade	3.8%	3.6%	3.3%	3.6%	3.8%	3.8%	3.6%
Retail trade	9.9%	10.0%	10.3%	9.2%	8.9%	9.0%	9.0%
Finance and insurance	2.9%	2.8%	3.1%	2.6%	2.7%	2.7%	2.8%
Real estate	1.4%	1.4%	1.3%	1.4%	1.3%	1.4%	1.4%
Business service	3.4%	3.7%	4.4%	4.8%	6.1%	6.7%	6.8%
Government service	6.2%	6.1%	6.1%	4.6%	4.2%	4.2%	5.1%
Educational service	5.4%	5.2%	5.4%	5.2%	5.2%	5.4%	5.8%
Health and social service	6.0%	6.5%	7.0%	7.2%	7.5%	7.9%	8.3%
Accommodation, food and beverage	4.9%	5.1%	5.3%	5.2%	5.2%	5.1%	4.9%
Other services	4.6%	5.2%	5.4%	5.8%	5.5%	5.6%	5.4%
Not applicable	19.0%	20.9%	21.5%	26.5%	26.1%	25.8%	27.2%

Table 1b (continuation)

	1981	1986	1991	1996	2001	2006	2011
Occupation (Based on SOC 91)							
Management			7.4%	6.4%	7.5%	7.0%	7.1%
Senior management			0.7%	0.7%	0.9%	0.9%	0.8%
Business, finance and administrative			15.0%	13.9%	13.2%	13.4%	13.0%
Business and finance			2.1%	2.2%	2.6%	2.7%	2.8%
Natural and applied sciences and related			3.6%	3.6%	4.7%	4.8%	5.0%
Health			3.8%	3.6%	3.8%	4.1%	4.5%
Social science, education, government service and religion			5.0%	4.9%	5.1%	5.5%	6.8%
Art, culture, recreation and sport			1.9%	2.1%	2.2%	2.3%	2.5%
Sales and service			19.8%	19.6%	18.5%	18.8%	17.6%
Trades, transport and equipment operators and related			12.0%	10.3%	10.3%	10.7%	10.6%
Occupations unique to primary industry			4.1%	3.6%	3.2%	2.9%	2.4%
Occupations unique to processing, manufacturing and utilities			5.9%	5.6%	5.6%	4.8%	3.2%
Not Applicable			21.5%	26.5%	26.1%	25.8%	27.2%
Industry - Senior Management only							
Agriculture, forestry, fishing and hunting			1.1%	1.0%	1.0%	1.5%	1.4%
Mining, quarry and oil & gas			1.5%	1.9%	1.6%	1.8%	1.8%
Manufacturing			19.5%	18.2%	15.2%	14.1%	11.9%
Construction			8.1%	6.8%	5.4%	6.8%	7.7%
Transportation and storage			3.3%	3.6%	3.2%	3.4%	2.9%
Communication and other utility			2.4%	2.1%	2.8%	1.9%	1.3%
Wholesale trade			10.0%	11.6%	10.8%	10.5%	10.3%
Retail trade			9.0%	7.5%	5.7%	5.7%	5.6%
Finance and insurance			5.5%	5.3%	6.9%	6.3%	7.2%
Real estate			2.3%	2.6%	3.1%	3.5%	3.3%
Business service			10.1%	12.7%	17.3%	17.6%	17.4%
Government service			13.2%	11.9%	11.2%	9.1%	8.8%
Educational service			1.5%	1.5%	1.8%	2.2%	2.4%
Health and social service			4.1%	4.6%	5.3%	5.2%	6.2%
Accommodation, food and beverage			2.4%	1.7%	1.5%	2.1%	2.4%
Other services			5.9%	7.0%	7.2%	8.4%	9.2%
Largest Central Metropolitan Areas							
Montreal	11.9%	11.8%	11.6%	11.6%	11.5%	11.5%	11.4%
Toronto	13.2%	14.3%	14.6%	14.8%	15.5%	15.9%	16.5%
Calgary	2.6%	2.7%	2.8%	2.9%	3.3%	3.4%	3.6%
Edmonton	2.8%	3.1%	3.1%	3.0%	3.2%	3.3%	3.4%
Vancouver	5.7%	5.7%	6.1%	6.5%	6.7%	6.8%	7.0%
Rest of Canada	63.8%	62.2%	61.8%	61.2%	59.9%	59.0%	58.1%
Province of residence							
Newfoundland and Labrador	1.9%	1.9%	1.9%	1.9%	1.7%	1.6%	1.6%
Nova Scotia	3.3%	3.4%	3.2%	3.2%	3.0%	2.9%	2.8%
New Brunswick	2.7%	2.7%	2.6%	2.6%	2.5%	2.3%	2.3%
Quebec	25.6%	25.3%	25.0%	24.7%	24.2%	24.1%	23.9%
Ontario	36.5%	37.1%	37.6%	37.4%	37.8%	38.2%	38.3%
Manitoba	4.3%	4.2%	4.0%	3.9%	3.7%	3.5%	3.5%
Saskatchewan	3.9%	3.9%	3.5%	3.4%	3.2%	3.0%	3.0%
Alberta	9.3%	9.2%	9.1%	9.2%	10.0%	10.3%	10.6%
British Columbia	11.8%	11.6%	12.2%	13.2%	13.2%	13.2%	13.4%
PEI/Yukon/NW Territories/Nunavut	0.7%	0.8%	0.8%	0.8%	0.7%	0.7%	0.7%
Population (000s)	15,722.6	17,061.9	19,345.6	20,916.8	22,723.1	24,423.2	25,918.5

Note: The sample consists of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Table 2a: Average Income by Sub-Groups of Top Income Earners, 1981 to 2011 (2000 Dollars)

	1980	1985	1990	1995	2000	2005	2010
Income cutoff (2000 Dollars)	122,439	118,871	125,213	119,795	140,150	153,908	160,232
Total Income (Millions)	31,048	33,233	41,163	43,523	59,888	83,649	83,000
Work and earnings							
Mean total income	197,476	194,733	212,754	204,364	263,433	342,487	320,235
Mean employment income	154,596	154,945	169,234	168,224	222,532	283,925	257,510
Work 50 hours or more per week	202,404	201,109	221,366	213,126	270,227	351,551	338,824
Only workers	196,968	195,765	213,683	206,172	264,366	341,078	317,956
Men	197,927	195,902	215,445	207,591	269,305	353,899	330,569
Women	192,610	184,237	195,546	186,258	234,520	293,277	279,690
Education							
Less than a bachelor's degree	199,026	192,360	212,036	202,334	252,479	332,147	310,945
Bachelor's degree	199,174	199,138	217,153	207,275	280,681	362,247	332,140
Medicine, dentistry, veterinary	193,395	195,346	209,020	198,711	228,682	264,072	276,029
Other graduate degrees	193,614	195,187	212,340	208,867	279,417	374,532	335,313
Age groups							
Under 35	184,330	175,753	194,326	190,027	237,574	265,980	267,993
35-64	198,259	195,169	212,291	203,744	263,734	339,881	314,670
Over 64	209,804	210,998	229,180	217,966	280,223	395,761	377,184
Major Field of Study							
Educational, Recreational and Counselling Services	166,541	185,078	193,567	242,902	305,506	277,523	
Fine and Applied Arts	183,822	201,533	187,580	252,626	319,172	302,072	
Humanities and Related Fields	182,058	211,401	204,854	268,565	333,744	301,970	
Social Sciences and Related Fields	199,789	222,292	210,366	283,285	353,880	330,882	
Commerce, Management and Business	197,619	213,723	213,166	290,116	387,484	351,715	
Agricultural, Biological, Nutritional, and Food Sc.	179,463	199,455	189,589	235,333	294,068	287,939	
Engineering and Applied Sciences	197,808	212,678	198,421	267,591	345,467	335,847	
Applied Science Technologies and Trades	178,062	202,611	191,909	241,776	311,860	280,756	
Health Professions and Related Technologies	194,524	208,495	198,239	231,352	273,891	278,402	
Mathematics, Computer and Physical Sciences	183,677	206,442	195,933	247,649	375,666	333,075	
No Specialization/No postsecondary educ.	198,856	217,589	208,378	260,149	357,498	330,015	
Overlapped					321,675	298,417	
Industry							
Agriculture, forestry, fishing and hunting	197,024	184,941	195,098	186,982	223,138	298,872	349,005
Mining, quarry and oil & gas	191,041	189,723	212,942	202,876	262,076	368,425	325,085
Manufacturing	192,290	195,838	208,717	216,429	276,795	358,888	339,291
Construction	202,966	202,125	265,346	210,151	278,968	412,812	353,933
Transportation and storage	186,373	173,678	190,267	184,994	228,670	312,807	268,646
Communication and other utility	172,405	172,038	192,443	182,760	252,521	286,168	294,521
Wholesale trade	204,423	203,908	225,948	212,640	262,643	339,279	309,513
Retail trade	201,587	206,712	220,390	206,246	270,912	355,267	337,182
Finance and insurance	232,659	229,941	233,053	247,249	347,607	449,075	393,278
Real estate	206,261	202,139	220,071	209,897	266,416	387,307	349,802
Business service	197,907	198,432	216,638	206,211	264,166	337,294	316,488
Government service	157,928	154,112	166,808	159,680	191,907	225,459	228,836
Educational service	159,630	160,243	169,264	166,891	200,941	260,351	254,150
Health and social service	196,175	196,509	209,671	198,872	230,133	270,557	276,712
Accommodation, food and beverage	212,749	212,422	205,750	193,637	245,854	381,346	335,958
Other services	208,189	181,251	219,319	210,336	269,699	300,353	330,258
Not applicable	209,271	189,551	209,522	188,098	239,726	352,244	333,820

Table 2a (continuation)

	1980	1985	1990	1995	2000	2005	2010
Occupation (Based on SOC 91)							
Management			233,410	225,875	301,671	397,701	353,533
Senior management			256,621	263,210	342,551	445,925	390,037
Business, finance and administrative			204,133	212,245	273,323	355,372	336,412
Business and finance			210,283	220,435	281,659	353,330	343,050
Natural and applied sciences and related			184,521	174,519	219,891	290,086	282,178
Health			209,752	199,356	229,263	271,421	277,195
Social science, education, government service and religion			204,166	195,482	252,477	314,536	309,064
Art, culture, recreation and sport			215,348	221,876	279,888	303,670	374,332
Sales and service			191,051	176,701	222,594	274,526	272,218
Trades, transport and equipment operators and related			197,882	172,922	218,951	322,284	273,754
Occupations unique to primary industry			193,292	179,833	211,977	279,549	297,147
Occupations unique to processing, manufacturing and utilities			171,831	165,297	214,086	273,332	228,985
Not Applicable			209,522	188,098	239,726	352,244	333,820
Industry - Senior Management only							
Agriculture, forestry, fishing and hunting			272,260	215,018	305,168	458,750	310,790
Mining, quarry and oil & gas			334,310	299,272	397,253	681,684	639,084
Manufacturing			249,078	293,979	353,118	463,607	445,659
Construction			312,731	264,124	404,440	496,645	462,190
Transportation and storage			268,117	228,839	293,758	423,008	318,682
Communication and other utility			227,350	241,222	323,706	372,645	396,251
Wholesale trade			274,594	266,511	336,590	461,882	383,925
Retail trade			259,883	272,602	354,937	442,294	355,764
Finance and insurance			263,570	273,484	427,296	487,603	411,622
Real estate			286,661	280,374	328,055	531,239	402,583
Business service			240,609	245,907	314,708	410,386	330,496
Government service			160,911	151,849	196,108	260,101	229,527
Educational service			170,478	165,186	209,828	265,655	241,631
Health and social service			190,313	196,205	257,095	290,660	360,945
Accommodation, food and beverage			222,514	213,016	330,137	445,109	378,791
Other services			251,944	256,687	258,298	271,616	271,460
Largest Central Metropolitan Areas							
Montreal	191,205	188,265	209,441	201,578	249,712	310,967	309,024
Toronto	209,676	211,223	229,959	221,335	301,527	385,355	352,476
Calgary	205,390	193,738	208,526	212,789	269,211	412,905	358,449
Edmonton	193,350	201,612	212,676	206,276	245,142	348,040	314,705
Vancouver	205,173	197,428	216,497	213,185	272,301	343,962	338,543
Rest of Canada	192,058	186,187	202,546	191,146	236,880	301,936	286,223
Province of residence							
Newfoundland and Labrador	184,419	187,803	206,902	184,575	227,296	265,317	241,721
Nova Scotia	180,915	183,004	190,830	184,965	240,071	274,421	279,402
New Brunswick	191,906	179,358	213,136	185,062	225,937	263,484	258,638
Quebec	189,566	183,171	200,401	193,293	241,122	300,482	298,238
Ontario	203,796	203,163	221,478	209,525	278,548	352,817	331,055
Manitoba	186,891	187,540	201,743	197,599	235,650	304,016	298,565
Saskatchewan	188,779	180,712	191,733	188,495	227,656	328,678	302,810
Alberta	197,450	193,180	205,166	210,247	254,731	381,821	326,647
British Columbia	200,227	194,212	213,600	206,797	260,012	334,455	324,817
PEI/Yukon/NW Territories/Nunavut	186,672	172,333	183,156	170,088	208,480	269,473	249,566

Note: The sample consists of the top one percent of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Table 2b: Average Income by Sub-Groups of All Income Earners, 1981 to 2011 (2000 Dollars)

	1980	1985	1990	1995	2000	2005	2010
Total Income (Millions)	443,231	470,174	565,253	573,945	676,442	772,984	862,766
Work and earnings							
Mean total income	28,191	27,557	29,219	27,439	29,769	31,650	33,288
Mean employment income	23,139	21,677	22,727	20,670	22,942	24,120	24,851
Work 50 hours or more per week	46,119	43,728	47,365	47,178	52,400	56,601	60,101
Only workers	34,617	33,488	35,115	33,907	36,546	38,499	41,297
Men	36,731	35,263	36,787	33,888	36,865	38,948	39,793
Women	18,252	19,112	21,397	20,918	22,885	24,655	27,023
Education							
Less than a bachelor's degree	25,827	24,880	26,205	24,266	25,747	26,851	27,986
Bachelor's degree	44,808	43,375	44,805	41,210	45,746	47,171	48,156
Medicine, dentistry, veterinary	103,663	107,178	104,207	94,618	94,607	102,625	96,600
Other graduate degrees	58,743	57,382	58,123	53,631	57,106	58,093	57,332
Age groups							
Under 35	23,377	21,624	22,458	19,498	20,427	20,442	21,944
35-64	36,261	35,369	36,763	34,368	36,932	39,412	41,246
Over 64	19,488	20,973	23,406	22,840	24,437	26,668	28,160
Major Field of Study (Based on MFS classification, 1986 - 2006)							
Educational, Recreational and Counselling Services		34,253	37,075	34,897	35,203	38,001	40,518
Fine and Applied Arts		23,331	25,547	22,471	24,404	23,340	24,763
Humanities and Related Fields		34,724	35,526	32,121	34,404	33,962	35,330
Social Sciences and Related Fields		42,585	44,237	39,436	43,365	46,210	46,789
Commerce, Management and Business		34,559	36,583	35,027	39,991	43,082	43,814
Agricultural, Biological, Nutritional, and Food Sc.		30,334	32,245	29,535	31,011	31,943	33,180
Engineering and Applied Sciences		60,272	59,557	51,366	56,264	53,848	56,609
Applied Science Technologies and Trades		37,971	40,186	36,831	38,987	39,676	40,682
Health Professions and Related Technologies		38,701	40,130	38,071	39,562	41,635	42,025
Mathematics, Computer and Physical Sciences		45,600	47,195	44,252	48,655	55,875	55,197
No Specialization/No postsecondary educ.		22,552	23,249	21,171	22,124	22,599	23,222
Overlapped						34,564	37,014
Industry							
Agriculture, forestry, fishing and hunting	26,384	23,431	25,080	24,266	25,622	25,045	27,475
Mining, quarry and oil & gas	46,735	50,280	51,946	53,053	57,949	72,235	79,406
Manufacturing	33,882	34,788	36,409	36,719	38,899	41,260	42,701
Construction	35,051	31,164	35,033	30,752	34,354	35,338	38,296
Transportation and storage	37,618	37,392	37,913	36,643	37,841	37,906	39,502
Communication and other utility	41,098	42,833	42,274	42,502	44,541	46,754	50,538
Wholesale trade	35,625	34,326	36,751	36,128	39,328	42,794	45,355
Retail trade	22,612	21,338	22,398	20,631	22,120	22,814	24,601
Finance and insurance	34,823	36,961	38,468	42,284	50,982	57,595	58,510
Real estate	38,624	36,300	39,719	36,684	42,288	46,133	47,521
Business service	38,225	37,748	41,251	39,091	44,861	45,619	48,772
Government service	36,464	36,597	38,418	39,856	42,373	46,817	49,052
Educational service	37,757	37,513	38,371	37,830	36,882	37,649	40,983
Health and social service	30,853	31,677	33,207	32,950	34,467	37,165	39,099
Accommodation, food and beverage	14,648	14,145	15,168	14,178	15,570	15,305	16,862
Other services	20,838	19,456	21,851	20,457	23,332	23,602	26,200
Not applicable	13,913	15,208	17,554	16,157	17,061	18,706	18,933

Table 2b (continuation)

	1980	1985	1990	1995	2000	2005	2010
Occupation (Based on SOC 91)							
Management			54,783	53,924	60,112	68,569	68,055
Senior management			96,386	95,677	109,304	131,894	126,672
Business, finance and administrative			29,222	30,022	32,659	35,057	37,806
Business and finance			42,520	44,717	49,293	53,584	56,226
Natural and applied sciences and related			46,869	45,922	48,026	51,168	54,932
Health			40,902	42,187	43,901	47,816	49,223
Social science, education, government service and religion			44,772	43,894	44,103	45,842	45,376
Art, culture, recreation and sport			27,423	25,074	27,743	26,042	27,917
Sales and service			20,746	19,577	20,506	20,820	22,643
Trades, transport and equipment operators and related			34,191	32,512	34,033	34,273	36,589
Occupations unique to primary industry			25,165	23,980	24,959	25,311	28,934
Occupations unique to processing, manufacturing and utilities			29,887	29,493	30,405	31,559	32,122
Not Applicable			17,554	16,157	17,061	18,706	18,933
Largest Central Metropolitan Areas							
Montreal	28,882	27,836	29,136	26,818	29,199	30,489	31,348
Toronto	31,489	32,182	35,070	31,560	35,618	36,291	36,409
Calgary	34,279	33,030	32,953	31,542	35,693	43,579	46,349
Edmonton	32,692	30,090	29,892	28,019	30,468	35,575	40,343
Vancouver	32,397	29,795	31,908	29,894	31,421	32,207	33,600
Rest of Canada	26,556	25,866	27,385	26,078	27,823	29,648	31,524
Province of residence							
Newfoundland and Labrador	22,712	21,450	22,866	21,465	22,620	24,640	28,734
Nova Scotia	23,406	24,291	25,389	23,471	25,297	26,914	29,052
New Brunswick	22,610	22,530	24,115	22,603	24,091	25,366	27,932
Quebec	27,022	25,840	27,257	25,264	27,125	28,597	29,768
Ontario	28,891	29,488	31,916	29,741	32,865	33,969	34,609
Manitoba	25,329	25,454	25,725	24,685	26,416	27,925	30,050
Saskatchewan	26,955	25,498	25,125	24,548	25,811	28,188	33,409
Alberta	31,879	29,789	29,738	28,465	31,350	37,654	41,727
British Columbia	30,894	28,141	30,125	28,636	29,613	30,777	32,276
PEI/Yukon/NW Territories/Nunavut	23,830	23,992	26,583	25,929	26,831	29,095	32,897

Note: The sample consists of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Summary Table: Selected Characteristics of Income Earners, 1981-2011

	Top earners			All earners			Relative proportions		
	1981	2006	2011	1981	2006	2011	1981	2006	2011
Income cutoff (2000 Dollars)	122,439	153,908	160,232						
Work and earnings									
Average hours of work (only workers)	48.6	48.8	45.8	39.1	39.0	37.6			
Fraction of income from earnings	80.1%	84.6%	82.0%	76.7%	63.0%	59.5%	1.0	1.3	1.4
Men	91.5%	81.2%	79.7%	53.8%	48.9%	49.1%	1.7	1.7	1.6
Education									
Less than a bachelor's degree	53.9%	35.4%	32.5%	90.9%	81.2%	78.4%	0.6	0.4	0.4
Bachelor's degree	17.6%	29.5%	32.0%	5.9%	12.0%	13.8%	3.0	2.5	2.3
Medicine, dentistry, veterinary	14.7%	12.1%	10.4%	0.4%	0.5%	0.6%	34.2	22.1	17.7
Other graduate degrees	13.8%	22.9%	25.2%	2.8%	6.2%	7.2%	5.0	3.7	3.5
Major Field of Study (base year: 1986)									
Commerce, Management and Business	16.2%	24.7%	25.3%	7.7%	10.5%	11.3%	2.1	2.3	2.2
Engineering and Applied Sciences	8.0%	9.0%	10.3%	1.3%	2.8%	3.0%	6.2	3.2	3.4
Health Professions and Related Technologies	19.3%	16.6%	15.2%	3.9%	5.8%	6.6%	4.9	2.9	2.3
Industry									
Mining, quarry and oil & gas	3.0%	5.7%	7.1%	1.4%	1.0%	1.1%	2.1	5.4	6.6
Finance and insurance	5.4%	10.8%	11.0%	2.9%	2.7%	2.8%	1.9	4.0	3.9
Business service	11.9%	19.0%	19.2%	3.4%	6.7%	6.8%	3.6	2.8	2.8
Occupation (base year: 1991)									
Management	35.0%	38.5%	36.3%	7.4%	7.0%	7.1%	4.7	5.5	5.1
Senior management	13.7%	16.8%	16.0%	0.7%	0.9%	0.8%	19.0	18.6	19.1
Business, finance and administrative	8.7%	12.7%	13.0%	15.0%	13.4%	13.0%	0.6	1.0	1.0
Business and finance	5.6%	9.1%	9.2%	2.1%	2.7%	2.8%	2.7	3.3	3.3
Natural and applied sciences and related	5.0%	7.5%	9.2%	3.6%	4.8%	5.0%	1.4	1.6	1.8
Province of residence									
Quebec	20.8%	16.7%	16.3%	25.6%	24.1%	23.9%	0.8	0.7	0.7
Ontario	38.9%	47.1%	43.1%	36.5%	38.2%	38.3%	1.1	1.2	1.1
Alberta	14.5%	17.0%	20.8%	9.3%	10.3%	10.6%	1.6	1.7	2.0
British Columbia	14.4%	12.0%	11.9%	11.8%	13.2%	13.4%	1.2	0.9	0.9

Note: The sample consists of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Appendix Table 1: Detailed Distribution for the Top 25 Fields of Study Among Top Income Earners

	Top income earners				All income earners				Relative proportions	
	1986	1991	1996	2001	1986	1991	1996	2001	1986	2001
Business and Commerce	5.9%	6.6%	8.5%	11.2%	1.4%	1.7%	2.1%	2.8%	4.2	4.0
Medicine — General	10.2%	9.8%	9.7%	8.8%	0.3%	0.3%	0.3%	0.3%	38.5	26.1
Financial Management	6.8%	6.6%	7.6%	8.2%	1.7%	2.0%	2.3%	2.5%	4.0	3.3
Law and Jurisprudence	6.2%	7.2%	7.2%	6.9%	0.4%	0.5%	0.5%	0.5%	15.1	12.6
Economics	1.7%	1.9%	2.2%	2.6%	0.3%	0.4%	0.4%	0.5%	5.2	5.2
Engineering, n.e.c.	0.7%	1.3%	1.7%	2.4%	0.1%	0.2%	0.3%	0.4%	6.7	6.6
Dentistry	2.6%	2.3%	2.6%	2.2%	0.1%	0.1%	0.1%	0.1%	31.0	20.3
Electrical/Electronic Engineering	1.2%	1.2%	1.2%	1.9%	0.3%	0.3%	0.3%	0.4%	4.9	4.1
Marketing, Merchandising, Retailing and Sales	1.1%	1.3%	1.7%	1.7%	0.6%	0.7%	0.7%	0.8%	1.9	2.1
Computer Science and Other Applied Mathematics	0.2%	0.4%	0.7%	1.6%	0.2%	0.3%	0.4%	0.5%	1.0	2.9
Medical Specializations (Non-surgical)	1.8%	1.5%	1.8%	1.6%	0.1%	0.1%	0.1%	0.1%	35.0	22.7
Electronic and Electrical Technologies	1.0%	1.0%	1.1%	1.3%	1.3%	1.4%	1.4%	1.3%	0.7	1.0
Building Technologies	1.1%	1.5%	1.2%	1.2%	1.9%	2.2%	2.1%	2.1%	0.6	0.6
Mechanical Engineering Technologies	1.3%	1.3%	1.3%	1.2%	2.0%	2.1%	2.2%	2.1%	0.6	0.6
Mechanical Engineering	1.5%	1.1%	1.3%	1.1%	0.2%	0.2%	0.3%	0.3%	6.4	3.5
Surgery and Surgical Specializations	1.7%	1.2%	1.3%	1.1%	0.0%	0.0%	0.0%	0.0%	52.5	34.0
Civil Engineering	1.6%	1.5%	1.2%	1.0%	0.2%	0.2%	0.3%	0.3%	6.8	3.5
Education - General	1.0%	1.2%	1.3%	1.0%	2.0%	2.2%	2.4%	2.4%	0.5	0.4
Psychology	0.6%	0.7%	0.9%	1.0%	0.5%	0.5%	0.7%	0.7%	1.2	1.4
Data Processing and Computer Technologies	0.1%	0.2%	0.4%	0.9%	0.5%	0.7%	0.9%	1.3%	0.2	0.7
Industrial Management and Public Administration	1.3%	1.0%	1.4%	0.9%	0.6%	0.7%	0.8%	0.7%	2.0	1.3
Biological and Chemical Engineering	1.1%	0.8%	0.8%	0.8%	0.1%	0.1%	0.1%	0.1%	11.0	6.3
Political Science	0.5%	0.6%	0.8%	0.7%	0.2%	0.2%	0.4%	0.3%	2.4	2.4
Mathematics	0.5%	0.5%	0.7%	0.7%	0.2%	0.2%	0.2%	0.2%	2.7	3.8
Geology and Related Fields	0.8%	0.6%	0.6%	0.7%	0.1%	0.1%	0.1%	0.1%	6.9	5.6
Other Major Fields of Study	17.1%	18.1%	18.6%	18.6%	19.3%	20.8%	22.7%	24.4%	0.9	0.8
No Specialization/No postsecondary education	30.7%	28.5%	22.4%	18.8%	65.4%	61.9%	57.9%	54.7%	0.5	0.3

Note: Major Field of Study classification used for 1986 to 2001

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Appendix Table 1 (continuation)

	Top income earners		All income earners		Relative proportions	
	2006	2011	2006	2011	2006	2011
Medicine (MD)	7.0%	6.5%	0.3%	0.3%	25.8	20.3
Business Administration, Management and Operations	6.9%	7.3%	2.3%	2.5%	3.0	2.9
Business/Commerce, General	6.5%	7.1%	1.4%	1.8%	4.5	4.0
Law (LLB, JD, BCL)	6.0%	5.8%	0.5%	0.5%	12.9	11.9
Accounting and Related Services	5.6%	5.7%	2.0%	2.2%	2.8	2.6
Medical Residency Programs	3.0%	2.1%	0.1%	0.1%	36.8	29.2
Economics	2.4%	2.3%	0.5%	0.6%	4.3	3.9
Finance and Financial Management Services	2.4%	2.3%	0.6%	0.6%	4.3	3.8
Medical Scientist (MSc, PhD)	2.0%	2.1%	0.1%	0.1%	23.1	21.1
Mechanical Engineering	1.6%	1.5%	0.4%	0.4%	3.7	3.7
Electrical, Electronics and Communications Engineering	1.5%	1.4%	0.6%	0.6%	2.5	2.5
Civil Engineering	1.4%	1.4%	0.4%	0.4%	3.8	3.8
Engineering, General	1.4%	3.0%	0.3%	0.6%	5.1	5.1
Dentistry (DDS, DMD)	1.4%	1.2%	0.1%	0.1%	18.4	13.4
Legal Research and Advanced Professional Studies (Post-LLB/JD)	1.1%	1.3%	0.1%	0.1%	13.7	13.2
Geological and Earth Sciences/Geosciences	1.1%	1.1%	0.1%	0.1%	8.4	8.1
Education, General	1.0%	1.3%	2.5%	2.7%	0.4	0.5
Liberal Arts and Sciences, General Studies and Humanities	1.0%	1.5%	1.0%	1.3%	1.0	1.2
Computer Science	0.9%	1.1%	0.7%	0.8%	1.4	1.4
Marketing	0.9%	0.8%	0.4%	0.4%	2.4	1.9
Chemical Engineering	0.9%	0.9%	0.1%	0.1%	6.1	6.0
Political Science and Government	0.8%	0.8%	0.3%	0.4%	2.6	2.4
Pharmacy, Pharmaceutical Sciences and Administration	0.8%	0.7%	0.2%	0.2%	4.3	3.5
Precision Metal Working	0.7%	0.7%	1.3%	1.3%	0.6	0.5
Psychology, General	0.7%	0.7%	0.6%	0.7%	1.1	1.0
Other Major Fields of Study	24.4%	25.9%	35.2%	36.9%	0.7	0.7
No Specialization/No postsecondary certificate or diploma	16.7%	13.6%	48.0%	44.4%	0.3	0.3

Note: Classification of Instructional Programs (2000) classification used for 2006 and 2011.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Appendix Table 2: Detailed Distribution by Industry

	Top income earners					All income earners					Relative proportions	
	1981	1986	1991	1996	2001	1981	1986	1991	1996	2001	1981	2001
Industry classification based on SIC 1970 (1981) and SIC 1980 (1986-2001)												
Agricultural and rel. service	6.6%	4.3%	3.7%	2.0%	1.5%	3.2%	3.0%	2.8%	2.5%	2.1%	2.1	0.7
Fishing and trapping	0.2%	0.2%	0.2%	0.3%	0.1%	0.3%	0.3%	0.3%	0.3%	0.3%	0.6	0.6
Logging and forestry	0.7%	0.5%	0.6%	0.6%	0.3%	0.7%	0.7%	0.6%	0.6%	0.5%	1.0	0.7
Mining, quarry and oil wells	3.0%	3.7%	2.5%	2.7%	2.9%	1.4%	1.2%	1.0%	0.8%	0.8%	2.1	3.6
Manufacturing	11.9%	12.0%	10.7%	11.9%	11.5%	15.3%	13.5%	11.4%	10.4%	10.4%	0.8	1.1
Construction	5.7%	4.3%	5.4%	3.4%	3.6%	5.2%	4.7%	5.1%	4.2%	4.3%	1.1	0.8
Transportation and storage	4.5%	4.3%	3.9%	3.7%	3.4%	3.8%	3.5%	3.2%	3.0%	3.1%	1.2	1.1
Communication and other utility	1.5%	1.9%	2.0%	2.2%	2.5%	2.6%	2.5%	2.6%	2.2%	2.1%	0.6	1.2
Wholesale trade	7.0%	5.9%	5.4%	6.8%	7.3%	3.8%	3.6%	3.3%	3.6%	3.8%	1.8	1.9
Retail trade	5.5%	5.0%	5.2%	3.9%	4.1%	9.9%	10.0%	10.3%	9.2%	8.9%	0.6	0.5
Finance and insurance	5.4%	6.5%	6.7%	8.3%	10.2%	2.9%	2.8%	3.1%	2.6%	2.7%	1.9	3.8
Real estate	4.8%	4.3%	4.2%	3.9%	3.9%	1.4%	1.4%	1.3%	1.4%	1.3%	3.4	3.0
Business services	11.9%	13.6%	15.5%	16.7%	20.8%	3.4%	3.7%	4.4%	4.8%	6.1%	3.6	3.4
Government services	3.4%	3.5%	3.7%	3.4%	2.2%	6.2%	6.1%	6.1%	4.6%	4.2%	0.5	0.5
Educational services	3.2%	3.3%	3.2%	3.2%	1.9%	5.4%	5.2%	5.4%	5.2%	5.2%	0.6	0.4
Health and social services	15.6%	17.3%	15.8%	16.4%	15.0%	6.0%	6.5%	7.0%	7.2%	7.5%	2.6	2.0
Accommodation, food and beverage	1.4%	1.4%	1.3%	1.1%	1.1%	4.9%	5.1%	5.3%	5.2%	5.2%	0.3	0.2
Other service industries	2.2%	2.8%	3.0%	3.1%	2.8%	4.6%	5.2%	5.4%	5.8%	5.5%	0.5	0.5
Not applicable	5.5%	5.3%	6.8%	6.4%	4.8%	19.0%	20.9%	21.5%	26.5%	26.1%	0.3	0.2

Note: The sample consists of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Appendix Table 2 (continuation)

	Top income earners			All income earners			Relative proportions	
	2001	2006	2011	2001	2006	2011	2006	2011
Industry classification based on NAICS 1997 (2001), 2002 (2006), and 2007 (2011)								
Agriculture, forestry, fishing and hunting	1.8%	1.2%	0.9%	2.7%	2.3%	1.8%	0.5	0.5
Mining and oil and gas extraction	2.8%	5.6%	7.0%	0.8%	1.0%	1.1%	5.4	6.6
Utilities	0.7%	1.0%	1.5%	0.6%	0.6%	0.6%	1.7	2.4
Construction	3.6%	4.1%	5.2%	4.1%	4.7%	5.0%	0.9	1.0
Manufacturing	10.9%	9.0%	7.1%	10.2%	8.7%	6.6%	1.0	1.1
Wholesale trade	6.9%	7.3%	6.6%	3.2%	3.2%	3.0%	2.3	2.2
Retail trade	4.2%	4.4%	4.0%	8.4%	8.5%	8.5%	0.5	0.5
Transportation and warehousing	3.5%	2.7%	2.5%	3.6%	3.6%	3.4%	0.8	0.7
Information and cultural industries	3.6%	3.0%	2.7%	2.0%	1.8%	1.7%	1.6	1.6
Finance and insurance	10.9%	11.5%	11.6%	3.0%	3.0%	3.1%	3.9	3.7
Real estate and rental and leasing	3.1%	3.3%	3.1%	1.2%	1.3%	1.3%	2.5	2.3
Professional, scientific and technical	18.5%	16.8%	17.0%	4.6%	4.9%	5.1%	3.4	3.3
Management of companies and enterprises	0.6%	0.7%	0.5%	0.1%	0.1%	0.1%	7.9	6.9
Administrative and support, waste man	1.6%	1.4%	1.6%	2.9%	3.2%	3.1%	0.4	0.5
Educational services	1.8%	1.7%	3.0%	4.9%	5.1%	5.5%	0.3	0.5
Health care and social assistance	15.0%	15.3%	13.3%	7.1%	7.5%	8.0%	2.0	1.7
Arts, entertainment and recreation	0.8%	0.7%	0.6%	1.5%	1.6%	1.6%	0.4	0.4
Accommodation and food services	1.1%	0.8%	0.8%	5.1%	5.1%	4.8%	0.2	0.2
Other services (except public administration)	1.3%	1.2%	1.5%	3.6%	3.6%	3.4%	0.3	0.5
Public administration	2.3%	2.3%	3.6%	4.3%	4.3%	5.2%	0.5	0.7
Not applicable	4.8%	5.8%	5.6%	26.1%	25.8%	27.2%	0.2	0.2

Note: The sample consists of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.

Appendix Table 3: Industry Distribution for Senior Management, 1981-2011

	1991	1996	2001	2006	2011	Relative proportions		
						1991	2006	2011
Top income earners (top 1 percent), senior management								
Agriculture, forestry, fishing and hunting	0.7%	1.0%	0.6%	0.7%	0.8%	0.6	0.5	0.6
Mining, quarry and oil & gas	3.8%	4.4%	3.7%	4.3%	4.9%	2.5	2.4	2.7
Manufacturing	25.6%	24.5%	20.8%	19.7%	15.6%	1.3	1.4	1.3
Construction	7.2%	4.9%	3.7%	5.4%	7.2%	0.9	0.8	0.9
Transportation and storage	3.4%	3.9%	3.4%	3.5%	3.4%	1.0	1.0	1.2
Communication and other utility	3.4%	3.6%	4.9%	3.9%	2.9%	1.4	2.1	2.2
Wholesale trade	12.0%	13.6%	12.0%	12.5%	12.4%	1.2	1.2	1.2
Retail trade	6.7%	4.9%	4.5%	4.4%	4.4%	0.7	0.8	0.8
Finance and insurance	10.2%	10.5%	13.2%	13.6%	14.0%	1.9	2.2	2.0
Real estate	3.2%	3.8%	3.9%	4.3%	4.6%	1.4	1.2	1.4
Business service	11.9%	12.9%	20.2%	17.1%	17.3%	1.2	1.0	1.0
Government service	4.5%	3.2%	1.9%	2.3%	3.2%	0.3	0.3	0.4
Educational service	0.7%	0.9%	0.7%	0.8%	1.0%	0.5	0.4	0.4
Health and social service	1.7%	2.5%	1.9%	1.7%	2.2%	0.4	0.3	0.4
Accommodation, food and beverage	1.7%	1.1%	1.0%	1.2%	1.3%	0.7	0.6	0.5
Other services	3.5%	4.1%	3.6%	4.5%	4.9%	0.6	0.5	0.5
All income earners (senior management only)								
Agriculture, forestry, fishing and hunting	1.1%	1.0%	1.0%	1.5%	1.4%			
Mining, quarry and oil & gas	1.5%	1.9%	1.6%	1.8%	1.8%			
Manufacturing	19.5%	18.2%	15.2%	14.1%	11.9%			
Construction	8.1%	6.8%	5.4%	6.8%	7.7%			
Transportation and storage	3.3%	3.6%	3.2%	3.4%	2.9%			
Communication and other utility	2.4%	2.1%	2.8%	1.9%	1.3%			
Wholesale trade	10.0%	11.6%	10.8%	10.5%	10.3%			
Retail trade	9.0%	7.5%	5.7%	5.7%	5.6%			
Finance and insurance	5.5%	5.3%	6.9%	6.3%	7.2%			
Real estate	2.3%	2.6%	3.1%	3.5%	3.3%			
Business service	10.1%	12.7%	17.3%	17.6%	17.4%			
Government service	13.2%	11.9%	11.2%	9.1%	8.8%			
Educational service	1.5%	1.5%	1.8%	2.2%	2.4%			
Health and social service	4.1%	4.6%	5.3%	5.2%	6.2%			
Accommodation, food and beverage	2.4%	1.7%	1.5%	2.1%	2.4%			
Other services	5.9%	7.0%	7.2%	8.4%	9.2%			

Note: The sample consists of all income earners (individuals with non-zero income) age 15 and above.

Source: Authors' calculations based on data from the master files of the 1981 to 2006 census and the 2011 National Household Survey.