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Abstract

This research attempts to figure out whether the wage distributions of Canadian wage earners have been moving towards or away from the flowing three ideals in the early part of the 21th century. First, there be a pattern of wage increase that is shared by a large majority of wage earners. Second, the historical gender inequality in wage be reduced. Third, there be a decrease in wage inequality for both males and females.

We use the long-form records of the 2001 and 2006 population censuses to carry out our investigation. A nice feature of these records is that the values of income variables are not top-coded so that the true averages will not be understated and good insights into the situations of those with extremely high incomes can be obtained.

We are disappointed by finding that the Canadian economy mostly drifted away from our three ideals, with the main exception being that for female wage earners the improvement in wage was fortunately shared by a large majority. We believe that an important reason for our disappointing finding is the progressive entrenchment of market fundamentalism in Canada.

Incidentally, we have discovered that Statistics Canada did a good job in designing the 2006 census questionnaire so that the annoying choppiness that occurred to the 2000 wage distributions vanished in the 2005 wage distributions.

Keywords: male and female wage distributions; gender inequality; wage inequality; Canada; long-form census records, market fundamentalism

JEL Codes: D31, H31, H24

1. Introduction

In this paper, we choose to consider the following three ideals about the wages of wage earners in the labor market. First, there be a pattern of wage increase that is shared by a large majority of wage earners. Second, the historical gender inequality in wage be reduced. Third, there be a decrease in wage inequality for both males and females.

The main question we wish to deal with is to what extent the Canadian labor market was moving towards or away from these ideals during the first five years of the 21th century.

To provide a concrete answer to this question, we use the long-form records of wage earners in the 2001 and 2006 population censuses of Canada. To access these confidential and valuable records, we were required to submit a research proposal to a joint committee of Statistics Canada and the Social Sciences and Humanities Research Council of Canada. We are thankful to the committee for the approval of our proposal. We access this data base via the Research Data Center (RDC) at McMaster University.

There are two important advantages of this data base over the Public Use Micro-data Files of Canadian censuses due to the fact that income variables are not top-coded in this data base: (1) the average values computed for these variables will not be understated; and (2) greater insights into the incomes of extremely-well-paid individuals can be obtained.

2. The Data

In the long-form questionnaires of the 2001 and 2006 censuses for each household, there was a question on the "total wages and salaries"[1] earned from "paid employment" in the previous calendar year for each individual aged 15 or over. There was another question on the number of weeks worked in the previous calendar year for the same individual. We define "wage earners" as those individuals who (1) had a positive value for "total wages and salaries", (2) worked for at least ten weeks, and (3) was aged less than 65 (the conventional retirement age).[2] The restriction on the duration of work is

[1] For "total wages and salaries", the 2001 census questionnaire instructed respondents to include "commissions, bonuses, tips, etc., before any deductions", whereas the 2006 census questionnaire instructed them to include "commissions, bonuses, tips, taxable benefits, research grants, royalties, etc., before any deductions". This difference in instruction between the two questionnaires might have resulted in somewhat more items being included in the 2006 census than in the 2001 census.

[2] The individuals in collective units (e.g. prisons, nursing homes, and military camps) are excluded from our study, because their records are not included in the RDC data base.

intended to remove occasional or casual workers from our study.[3] Note that these wage earners span a wide range from cashiers and kitchen helpers at one extreme to hedge fund managers and corporate CEOs at the other extreme.

We choose to define "wage" for each wage earner as the "total wages and salaries" divided by the corresponding weeks of work. Thus, the unit of wage is "$/week". To make the 2000 and 2005 wages comparable, we multiply an inflation factor of 1.11272 to the 2000 nominal wage[4]. Thus, the common unit of this variable is measured in terms of the current value of the 2005 dollar.

It is important to note that all records in our data set contain a weight variable whose values are positive and need not be integers.[5] These values have two properties. First, they vary with the sampling intensities of different subsets of individuals: the greater the sampling intensity, the smaller the weight. Second, since each of the two censuses is designed to have about 20% of the residents in Canada receiving the long-form questionnaire, the average values of this variable across all records in our data set is very close to 5. Due to these two properties, we use the weight variable in all of our computations so that we can (1) avoid unintended biases resulting from the designed variation in sampling intensity and (2) reflect properly the actual numbers of various kinds of individuals in the Canadian population.

For every tabulated data to be taken out of the RDC by researchers, a set of restrictions have been imposed by Statistics Canada. First, all weighted volumes of individuals in any cell must be independently rounded so that the last digit is either 0 or 5. Second, any weighted volume must not be less than 10 persons, and the corresponding un-weighted counts must not be less than four records. Third, if any of the income variables is used, then for each cell the income variable must satisfy two conditions: (1) the range must not be less than 15% of the maximum, and (2) the maximum must be less than 95% of the un-weighted sum. An implication of the first restriction is that the sum of

[3] In the previous joint research of the first author (Liaw and Ishikawa, 2011; Liaw and Huang) using the merged micro data of the 2005-2007 American Community Surveys, some records with relatively few work weeks were found to have highly unreliable values for wages and salaries (e.g. a person with a menial occupation reporting an unrealistically high value). To avoid getting misleading results, the records with less than 10 weeks of work were excluded.

[4] The inflation factor of 1.11272 is obtained by dividing the CPI in December 2005 by the CPI in December 2000. The source of CPI data is Statistics Canada.

[5] In contrast to Statistics Canada, the U.S. Census Bureau has unwisely imposed the requirement that all weights must be integers. This requirement forces some long-form records to have zero weights. For any computation using the weight variable, all such records will be wiped and hence contribute no information at all. This is a highly undesirable outcome, because most of the records with zero weights belong to the minority groups that were intentionally oversampled so that more reliable information can be collected from them. But, in the end, this additional information is wiped out by the zero weights! To make the matter worse, the Census Bureau has also been applying the same requirement to the records of American Community Surveys.

cell volumes across a row may not be identical to the volume of the row total. An implication of the second restriction is that when many categories are used, the values of some cells in the resulting table may have to be deleted.

To get a clear visual image of the male and female distributions, we use 75 wage intervals with the same width of $40 (0-39, 40-79, ..., 2960-2999) plus an open-ended interval of $3000+ to tabulate the individual records. It turns out that for most wage intervals, the first of the two conditions on wage income is violated. Being unable to take out the tabulated numerical results from the RDC, we drew the distributions directly at the RDC and were able to take out the graphic images.

3. The Findings

The number of Canada's wage earners increased by 816,005 (from 14,049,670 in 2001 to 14,865,675 in 2006), implying a growth rate of 5.8% per 5 years. This growth rate was somewhat higher than the corresponding population growth rate of 5.4%. Incidentally, this difference reflected the fact that immigration has been an important contributor to Canada's population growth.

The growth of male wage earners (304,265 or 4.1%) was slower than the growth of female wage earners (511,740 or 7.6%), resulting in a reduction in the male share of all wage earners from 52.3% in 2001 to 51.5% in 2006. An important reason for this convergence towards gender equality in employment size was the expansions of the female-dominated healthcare and education sectors and the shrinkage of the male-dominated manufacturing sector.

In terms of average wage, the levels of both male and female wages showed clear improvement. For male wage earners, the average wage increased by $60 or 6.3% from $959 in 2000 to $1,020 in 2005 (Table 1). For female wage earners, the average wage increased by $36 or 5.6% from $640 in 2000 to $676 in 2005.

Was the wage improvement shared by a large majority of the wage earners? To answer this question for each gender, we choose to look at the changes in a set of five percentiles from low to high income: the 10th, the 25th (i.e. the 1st quartile), the 50th (i.e. the median), the 75th (i.e. the 3rd quartile), and the 90th (Table 1).

Based on these changes, our answer is "no" for male wage earners and "yes" for female wage earners. For males, the 10th, 25th, and 50th percentiles did not show any improvement from 2000 to 2005. Instead, the changes in these three percentiles were slightly negative. For females, there was clear improvement in all five percentiles, especially the 10th percentile (which increased by 10.5%) and the 90th percentile (which increased by 7.1%).

Table 1. The level, dispersion, and right skewness of weekly wage distributions of male and female wage earners in the 2001 and 2006 censuses.

Year of Income	**Average Wage**	10th percentile	25th percentile	Median Wage	75th percentile	90th percentile	Inter-quartile Range	Inter-quantile Dispersion Index (%)	Inter-decile Dispersion Index (%)	Right Skewness Index	**Volume (person)**
					Male						
2000	**$959**	$214	$467	$810	$1,198	$1,690	$731	90.3	182.3	1.48	**7,351,580**
2005	**$1,020**	$212	$464	$809	$1,250	$1,790	$786	97.1	195.1	1.65	**7,655,845**
Change	**$60**	-$2	-$3	-$1	$52	$100	$55	6.9	12.7	0.17	**304,265**
Change (%)	**6.3**	-0.8	-0.6	-0.1	4.3	5.9	7.5				**4.1**
					Female						
2000	**$640**	$139	$300	$553	$850	$1,199	$550	99.5	191.7	1.56	**6,698,090**
2005	**$676**	$154	$308	$566	$882	$1,284	$573	101.4	199.8	1.74	**7,209,830**
Change	**$36**	$15	$9	$13	$32	$85	$23	1.9	8.1	0.18	**511,740**
Change (%)	**5.6**	10.5	2.9	2.3	3.8	7.1	4.3				**7.6**
					Gender Gap (Male - Female)						
2000	**$319**	$75	$168	$257	$349	$491	$181	-9.2	-9.4	-0.08	**653,490**
2005	**$344**	$59	$156	$243	$368	$506	$212	-4.2	-4.7	-0.10	**446,015**
Change	**$25**	-$16	-$12	-$14	$19	$15	$31	5.0	4.7	-0.02	**-207,475**
Change (%)	**7.7**	-21.9	-7.0	-5.3	5.6	3.1	17.2				**-31.7**
					Gender Ratio (Male / Female)						
2000	**1.50**	1.54	1.56	1.46	1.41	1.41	1.33				**1.10**
2005	**1.51**	1.38	1.51	1.43	1.42	1.39	1.37				**1.06**
Change	**0.01**	-0.16	-0.05	-0.03	0.01	-0.02	0.04				**-0.04**

To study the movement towards or away from gender equality in wage, we choose to measure gender inequality by "gender gap" (i.e. male wage minus female wage) and "gender ratio" (i.e. male wage divided by female wage) (see the bottom two panels of Table 1).

In terms of both gender gap and gender ratio, the gender inequality in average wage actually widened from 2000 to 2005. The gender gap widened by $25 (7.7%) from $319 in 2000 to $344 in 2005. The gender ratio increased by 0.01 from 1.50 in 2000 to 1.51 in 2005.

However, for the bottom half of the wage earners, especially the bottom 10 percent, the gender inequality clearly decreased in terms of both gender gap and gender ratio. The gender gap decreased by $16 (or 21.9%) for the 10th percentile, by $12 (or 7.0%) for the 25th percentile, and by $14 (or 5.3%) for the 50th percentile. The gender ratio decreased by 0.16 (from 1.54 to 1.38) for the 10th percentile, by 0.05 (from 1.56 to 1.51) for the 25th percentile, and by 0.03 (from 1.46 to 1.43) for the 50th percentile. The widespread reduction in gender inequality among the bottom half of wage earners was mainly due to clear wage improvement for females and partly due to slight wage deterioration for male.

An interesting finding is that although the gender gap showed a widened pattern for both 75th and 90th percentiles (the former by $19 and the latter by $15), the magnitudes of these changes were substantially smaller than the widened gender gap for the average wage (namely $25). Behind this puzzling contrast was the hidden fact that there was a very sharp widening of gender gap beyond the 90th percentile (i.e. among the very highly paid wage earners). We will take a closer look at this phenomenon later in this paper.

For each gender, did wage inequality increase or decrease from 2000 to 2005? To answer this question, we choose to measure wage inequality by three indicators: (1) ***inter-quartile range***, which is defined as **(P75 - P25)**, where P75 is the 75th percentile and P25 is the 25th percentile; (2) ***inter-quartile dispersion index***, which is defined as (**P75 -P25) / P50 * 100%**, where P50 is the median; and (3) ***inter-decile dispersion index***, which is defined as **(P90 - P10) / P50 * 100%**, where P90 is the 90th percentile and P10 is the 10th percentile. While the unit of the first indicator is real dollar, the second and third indicators are relative measures using the median as the reference. By considering the wage earners between the 25th and 75th percentiles as ***the middle class***, the first two indicators measure the inequality within the middle class. The third indicator has a broader scope: it measures the difference between the upper limit of the bottom 10% individuals and the lower limit of the top 10% individuals, expressed as a percentage of the median.

We see in Table 1 that in terms of any of these three indicators, wage inequality became worse for both male and female wage earners from 2000 to 2005. *Inter-quartile range* increased by $55 (7.5%) from $731 to $786 for males, and by $23 (4.3%) from $550 to $573 for females. *Inter-quartile dispersion index* increased by 6.9 percentage point (from 90.3% to 97.1%) for males, and by 1.9 percentage point (from 99.5% to 101.4%) for females. *Inter-decile dispersion index* increased by 12.7 percentage point (from 182.3% to 195.1%) for males, and by 8.1 percentage point (from 191.7% to 199.8%) for females. Thus, for both males and females, the worsening of income inequality occurred not only within the middle class but also between the worst paid 10% and the best paid 10%.

Although wage inequality in terms of real dollars has been greater for males than females in both 2000 and 2005, it is important to point out that wage inequality relative to median wage has been greater for females than for males, because median wage has been substantially lower for females than for males. Since the worsening of all three indicators of inequality was greater for males than for females, we see in Table 1 (panel 3) that while the gender gap in *inter-quartile range* increased by $31 (17.2%) from $181 in 2000 to $212 in 2005, the gender gap in *inter-quartile dispersion index* decreased in magnitude by 5 percentage points from -9.2% in 2000 to -4.2% in 2005, and the gender gap in *inter-decile dispersion index* also decreased in magnitude by 4.7 percentage points from -9.4% in 2000 to -4.7% in 2005.

Although the increase in wage inequality among both male and female wage earners was a disappointing outcome, we note that the increase was mainly related to the relatively large increase in the 75th and especially the 90th percentile. In other words, it was mainly due to better paid jobs becoming even better paid rather than not-so-well-paid jobs becoming poorly paid. This development should cause the wage distributions to become more "positively skewed".

To measure the extent of positive skewness, we choose to use ***right skewness index***, which is defined as (P90 - P50) / (P50 - P10). In other words, it is the gap between the 90th percentile and the median divided by the gap between the median and the 10th percentile. For a symmetric distribution, this index assumes the value of 1. The more the individuals are shifted from the symmetric pattern to the right-hand tail, the greater the index exceeds 1.

We find that in both 2000 and 2005, the wage distribution was more positively-skewed for females than for males, and that the wage distributions of both males and females became substantially more positively-skewed from 2000 to 2005. The *right skewness index* increased by 0.17 (from 1.48 to 1.65) for males and by 0.18 (from 1.56 to 1.74) for females (Table 1).

To get more detailed visual knowledge on the changes of male and female wage distributions, we have constructed Figures 1 to 3. For each gender and each year, Figure 1 shows the numbers of wage earners in 75 wage intervals of equal length, ranging from \$0-\$39 to \$2960-\$2999. The four curves linking these numbers show that for each gender, the curves became higher and more positively-skewed from 2000 to 2005.

To remove the effect of the 2000-2005 increase in the employment sizes of male and female wage earners, we change the raw frequency distributions in Figure 1 to the percentage distributions in Figure 2.

We see in Figure 2 that a long stretch of the right tail of both male and female distributions grew bigger from 2000 to 2005, implying increase in skewness. More interestingly, we also see that the greater skewness for females than for males in each year (shown in table 1) was due to the fact that the modal portion of female distributions was much closer to the left end of the wage scale than was the modal portion of male distributions. It was not due to female distributions having a bigger right tail than male distributions. On the contrary, the right tail was substantially smaller for females than for males. In short, the greater female skewness resulted from the fact that a huge proportion of female wage earners received very low weekly wages, partly as a consequence of their higher propensity to be part-time workers.

What might be the reason for the annoying choppiness in the curves for 2000? In order to understand why the curves were so choppy in 2000 and became quite smooth in 2005, we took a closer look at the long-form questionnaires. We found that Statistics Canada did a great job in adding the following question into the 2006 census questionnaire:

"Does this person give Statistics Canada permission to use the income information already available in his / her income tax files for the year ending
December 31, 2005?"

Before this question, Statistics Canada also added the following statement to help increase the chance that the respondents would answer "yes".

"To save time, each person can give Statistics Canada permission to use the income information already available in his / her income tax files instead of answering Question 52."

We believe the choppiness in the curves for 2000 resulted from the common tendency for people to write down simple numbers like 30,000, 40,000, 50,000, 60,000 or 70,000 as approximations for their annual wage and salary incomes. Indeed, we have confirmed that the major spikes in Figures 1 and 2 indeed correspond to such simple numbers. We also believe that the smoothness in the curves for 2005 was due to the above-mentioned improvement in the design of the 2006 census questionnaire.

Figure 1. Wage distributions of male and female wage earners in Canada in 2000 and 2005.
(The width of each wage interval is $40 per week. The $3K+ category is not shown.)

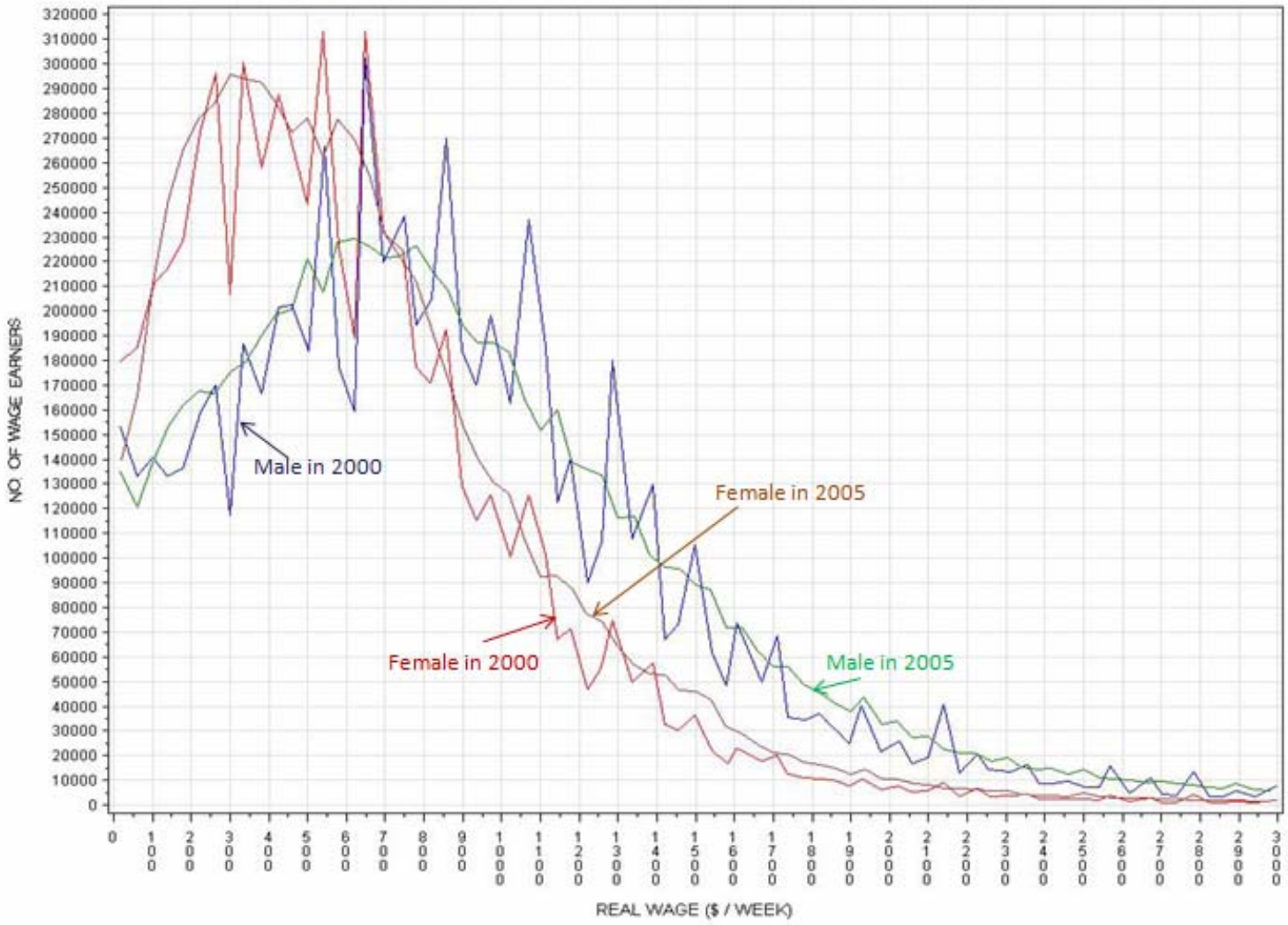


Figure 2. Percentage wage distributions of male and female wage earners in Canada in 2000 and 2005.
(The width of each wage interval is $40 per week. The $3K+ category is not shown.)

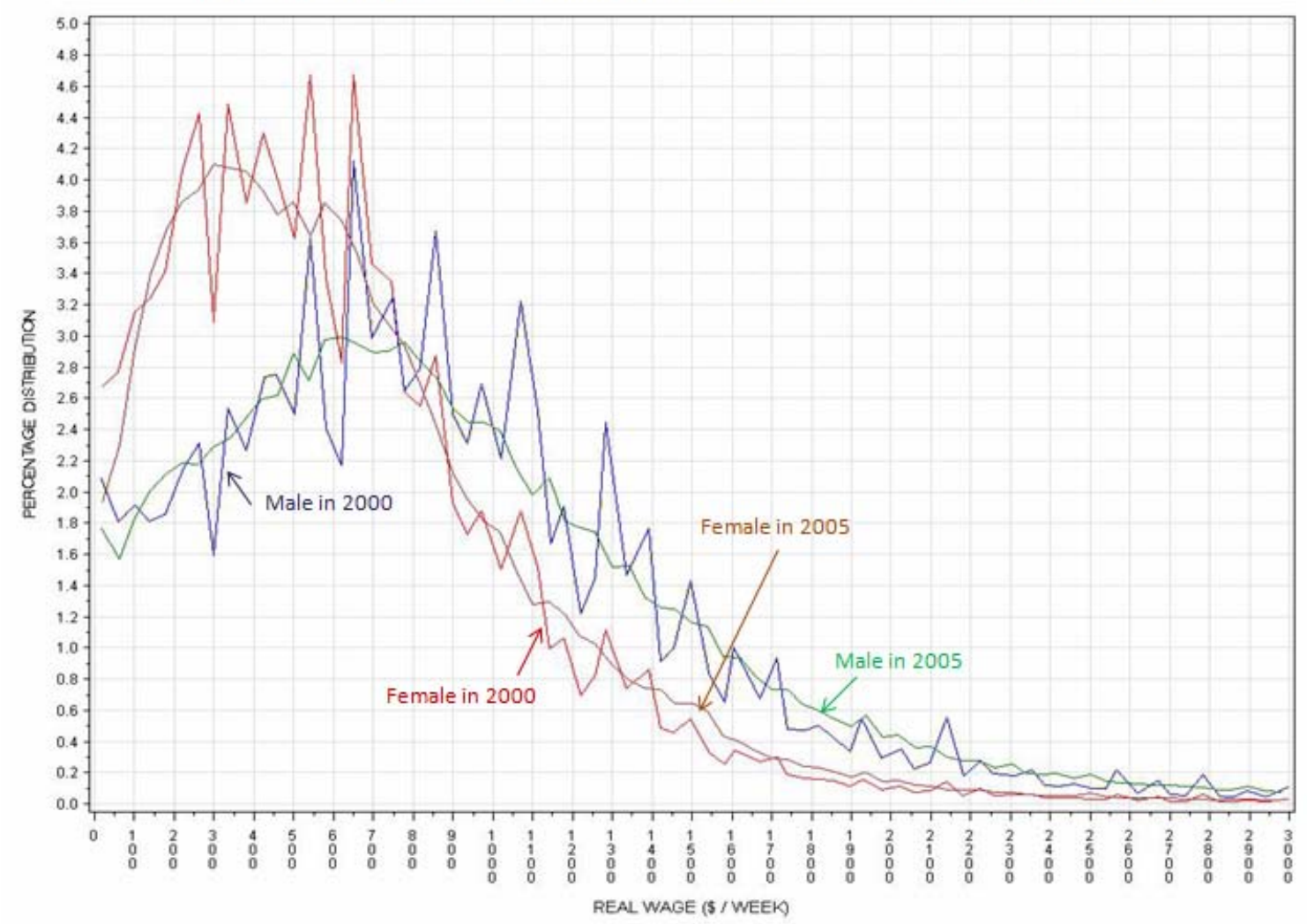
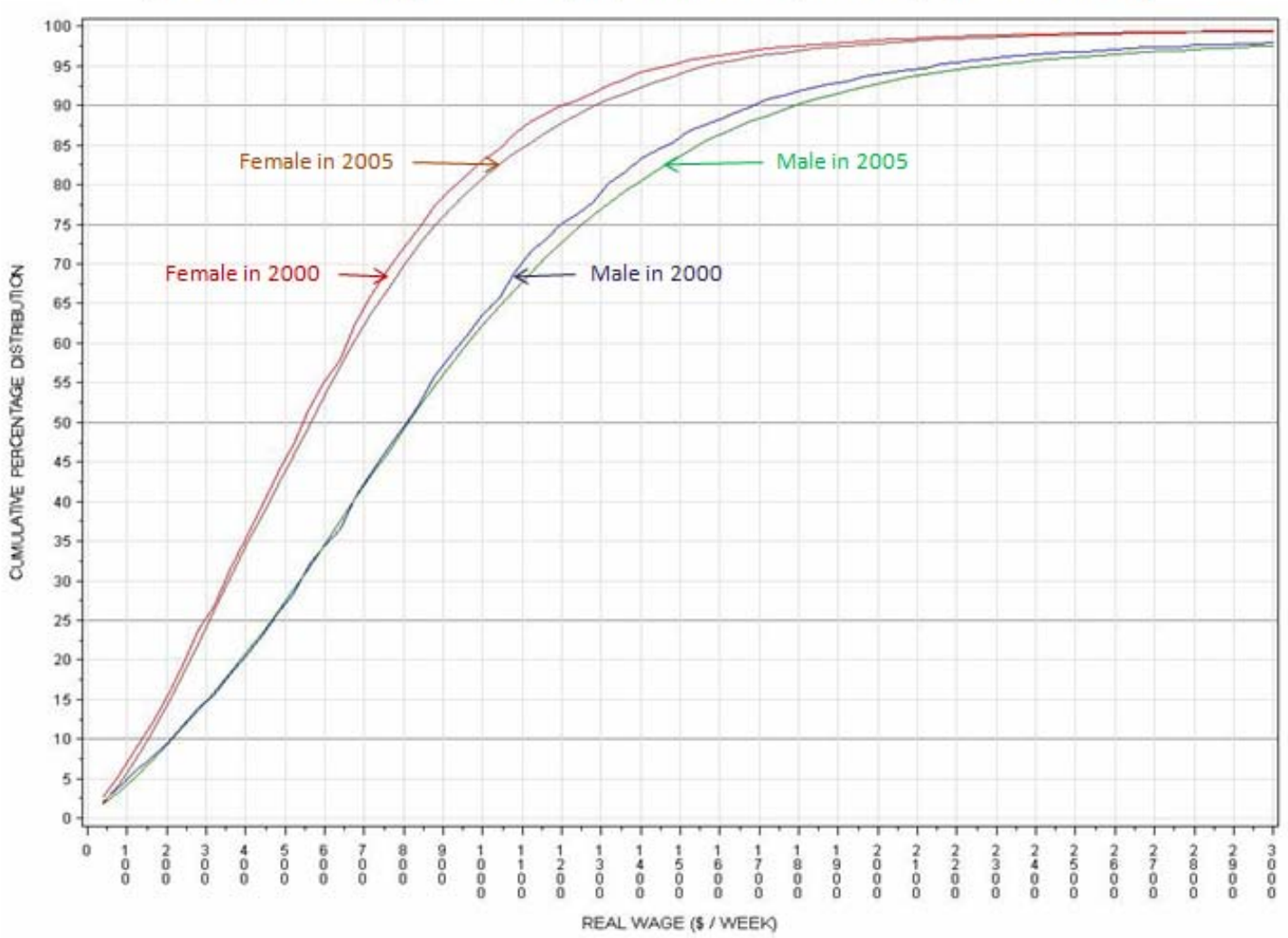


Figure 3. Cumulative wage distributions of male and female wage earners in Canada in 2000 and 2005. (The width of each wage interval is $40 per week. The $3K+ category is not included.)



The fact that sharp spikes tended to be immediately preceded or followed by sharp troughs in the curves for 2000 in Figures 1 and 2 implies that the respondents did not write down the simple numbers carelessly in the 2001 census. Instead, they tended to choose the simple numbers that were close to their actual incomes. Consequently, the curves representing the *cumulative percentage distributions* for 2000 in Figure 3 appear to be rather smooth.

Looking at the *horizontal gap* between the 2000 and 2005 male curves in Figure 3, we find that among male wage earners, the lack of clear improvement essentially spanned as many as 55% of them, stretching from the bottom all the way to a point beyond the median. Beyond the 55% mark, the horizontal gap tends to become wider as wage increases. This finding means that the jobs that became better paying in 2000-2005 were mostly already better paying jobs in 2000, and that among these relatively rewarding jobs, the magnitude of wage growth tended to be greater for the jobs that were already better paying in 2000. In short, the rich got richer, while the majority of the less fortunate got stuck.

For female wage earners, the whole cumulative percentage curve shifted to the right from 2000 to 2005, with the horizontal gap tending to be wider at higher wages. In other words, the rising tide lifted all boats. In terms of our first ideal that economic improvement be widely shared, this pattern of shift was a nice development. The fact that the horizontal gap widened markedly from the 75th percentile to the 90th percentile indicates that the females who were already very well paid in 2000 become much better paid than did their less well paid counterparts. Thus, although practically all female jobs became better paying, the improvement was particularly large for jobs that were already quite well-paying in 2000.

What Figures 1 to 3 have not shown was the situation and change of the wage earners in the $3,000+ interval. For simplicity, we call them ***elite wage earners***, and we will take a close look at them in the next subsection.

3.2. The Elite Wage Earners

In 2000, among the elite wage earners, there were 150,115 males and 34,535 females. Their sex ratio was 4.35, compared with the sex ratio of 1.10 for all wage earners in Canada. Clearly, females were substantially underrepresented among the elite. In other words, the glass ceiling was still a formidable barrier for them.

Among the elite, the average wage was $5,540 for males and $4,794 for females, implying a gender gap of $746 and a gender ratio of 1.16 (Table 2). Thus, above the glass

Table 2. The level, dispersion, and right skewness of weekly wage distributions of male and female wage earners in the $3K+ wage category in the 2001 and 2006 censuses.

Year of Income	**Average Wage**	10th percentile	25th percentile	Median Wage	75th percentile	90th percentile	Inter-quartile Range	Inter-quartile Dispersion Index (%)	Inter-decile Dispersion Index (%)	Right Skewness Index	**Volume (person)**
					Male						
2000	**$5,540**	$3,185	$3,386	$4,066	$5,378	$8,345	$1,992	49.0	126.9	4.86	**150,115**
2005	**$6,381**	$3,132	$3,395	$4,105	$5,867	$9,961	$2,472	60.2	166.3	6.02	**188,825**
Change	**$841**	-$53	$9	$39	$489	$1,615	$480	11.2	39.4	1.16	**38,710**
Change (%)	**15.2**	-1.7	0.3	1.0	9.1	19.4	24.1				**25.8**
					Female						
2000	**$4,794**	$3,140	$3,338	$3,852	$4,893	$6,777	$1,555	40.4	94.4	4.11	**34,535**
2005	**$5,176**	$3,112	$3,332	$3,894	$5,074	$7,508	$1,743	44.8	112.9	4.63	**44,340**
Change	**$382**	-$28	-$6	$42	$181	$731	$188	4.4	18.5	0.51	**9,805**
Change (%)	**8.0**	-0.9	-0.2	1.1	3.7	10.8	12.1				**28.4**
					Gender Gap (Male - Female)						
2000	**$746**	$45	$48	$214	$485	$1,568	$437	8.6	32.5	0.75	**115,580**
2005	**$1,206**	$20	$63	$212	$793	$2,453	$729	15.5	53.4	1.39	**144,485**
Change	**$459**	-$24	$15	-$2	$307	$885	$292	6.8	20.9	0.65	**28,905**
Change (%)	**61.6**	-55.0	32.2	-1.1	63.4	56.4	66.8				**25.0**
					Gender Ratio (Male / Female)						
2000	**1.16**	1.01	1.01	1.06	1.10	1.23	1.28				**4.35**
2005	**1.23**	1.01	1.02	1.05	1.16	1.33	1.42				**4.26**
Change	**0.08**	-0.01	0.00	0.00	0.06	0.10	0.14				**-0.09**

ceiling, female elites were still substantially less well paid than were male elites at the beginning of our study period.

A particularly impressive change from 2000 to 2005 was a very sharp increase in the numbers of both male and female elite wage earners. For males, the volume of the elite increased by 25.8%, compared with only 4.1% for all male wage earners. For females, the volume of the elite increased by 28.4%, compared with only 7.6% for all female wage earners (Tables 1 and 2). Thus, during 2000-2005, both males and females were able to break into the elite class with a vengeance. The sex ratio of the elite was cut by 0.09 from 4.35 in 2000 to 4.26 in 2005. Here we indeed see an approach towards the ideal of gender equality.

However, the gender inequality in average wage among the elite actually worsened substantially from 2000 to 2005. The gender gap in average wage increased from $746 in 2000 to a hefty $1,206 in 2005, with the increase being $459 or 61.6%! And the corresponding gender ratio in average wage increased from 1.16 to 1.23. Although the average wage of female elites did increase markedly by $382 or 8.0%, the average wage of male elites increased drastically by $841 or 15.2%.

For both male and female elites, much of the increase in wage was concentrated in the upper 50%, and especially the top 10% (Table 2). If we call the top 10% of the elite as ***the super-elite***, then among male wage earners, the lower limit of the wages of the super-elite increased most sharply by 19.4% from $ 8,345 in 2000 to $9,961 in 2005. For female super-elites, the corresponding increase was a respectable 10.8% from $6,777 to $7,508.

The elite represented very small proportions of all wage earners. For males, their share was 2.04% in 2000 and 2.47% in 2005. For females, their share was 0.52% in 2000 and 0.61% in 2005.

Despite their very small shares of all wage earners, both male and female elites had rather large wage inequality among themselves in 2000, and the inequality increased substantially from 2000 to 2005 (Table 2). For male elites, the inter-quartile range was $1,992 in 2000 and increased by 24.1% to $2,472 in 2005. For female elites, the inter-quartile range was $1,555 in 2000 and increased by 12.1% to $1,743 in 2005.

For each gender, the distribution of the elite was very skewed in 2000 and became markedly more skewed in 2005 (Table 2). For males, the *right skewness index* was 4.86 in 2000 and increased by 1.16 to 6.02 in 2005. For females, the *right skewness index* was 4.11 in 2000 and increased by 0.51 to 4.63 in 2005. The increased skewness reflected the fact that *the super-elite was the group that enjoyed the great benefit of Canada's economic improvement from 2000 to 2005. And this was especially true for males.*

It is highly likely that most of the new entrants into the elite class ended up in the lowest quarter. This is suggested by the negative changes in the 10th percentile and the near-zero changes in the 25th percentile of the elite class (Table 2). It contributed partly to the increases in both the inequality and the right skewness of the male and female distributions of the elite class. But, much of these increases were due to the sharp rise in the wages of the super-elite.

4. Concluding Discussion

We are disappointed by our finding that the Canadian economy mostly drifted away from our three ideals, with the main exception being that for female wage earners the improvement in wage was fortunately shared by a large majority.

The main features of our empirical finding, perhaps except for the widened gender gap in average wage, should be considered as part of a long-term trend since the mid-1980s (rather than an aberration) for two reasons. First, the Canadian economy did not experience major shocks in both 2000 and 2005. The year 2000 preceded the recession resulting from the bursting of the dot-com bubble, whereas the Canadian economy had recovered from the preceding recession by 2005, and the next recession resulting indirectly from the bursting of the housing bubble in the United States did not happen until 2008. Second, two recent studies (Beach, Finnie, and Gray, 2010; Veall, 2012), using the individual income tax records since 1982 in the Longitudinal Administrative Database (LAD), revealed that both male and female earners of wage income and "market income" in Canada experienced a long-term upward trend since 1985 (1) in income inequality and (2) in the shares of income by the top 1%, 0.1%, and 0.01% earners.[6]

To get some understanding of our empirical finding and a comparative perspective, we reproduce here Paul Krugman's (1999, p. 19) statements about the income inequality in the United States in the late 1990s when there was an impressive economic boom:

The forces of technological change and globalization had made it easier than ever before to grow truly rich, and raised the demand for highly skilled workers in general; but they had reduced the demand for the less skilled. Inequality of both wealth and income had increased to levels not seen since Great Gatsby days, and by official measures real wages had actually declined for many workers. Even if the numbers were taken with a grain of salt, it was pretty clear that the American economy's progress had left at least 20 or 30 million people at the bottom of the distribution slipping backward.

[6] Compared with the long-form census data set, LAD has the disadvantage of lacking information on such important attributes as educational attainment, duration of work, and country of birth. It is not useful for a multivariate explanatory study that involves such attributes.

It is likely that technological change and globalization were also an important cause for our finding that wage inequality increased for both male and female wage earners in Canada from 2000 to 2005.

But, at a more fundamental level, wage and income inequalities in not only Canada and the U. S. but also many other countries are aggravated by the progressive entrenchment of the ideology of ***market fundamentalism*** that had been very skillfully promoted by economists like Milton Friedman and Arthur Laffer, by politicians like Margaret Thatcher and Ronald Reagan, and by policymakers like Alan Greenspan and Robert Rubin over several decades (Krugman, 2012; Smith, 2010; Stiglitz, 2010). [7]

Market fundamentalism aggravates wage and income inequalities through various channels (Krugman, 2012, pp. 71-90). For example, via deregulation and failure to regulate new financial entities, it has helped boost extravagantly the rewards of hedge fund managers and corporate CEOs (not only in the financial sector but also in other sectors through increase in their powers and through "contagion"). Contrary to the claim of market fundamentalists that unfettered markets can prevent massive concentrations of power (Friedman, 1962; Miller, 1985), the big operators in the less-regulated markets became bigger and more powerful not only in markets *per se* but also in political arenas. Ironically, in the end "recipients of high incomes don't live in a supply-and-demand world" (Krugman, 2012, p. 78).

Michael Sandel (2009, p. 18) reported that "CEOs at top U.S. companies earn an average of $13.3 million per year (using 2004-2006 data), compared to $6.6 million for European chief executives and $1.5 million for CEOs in Japan." In our view, the big difference between Japan and the U.S. reflects that market fundamentalism is more entrenched in the U.S. than in Japan. In light of the near meltdown of the financial system of the U.S. in 2008, it would be absurd to claim that American CEOs are much more capable and hence deserve greater salaries than their Japanese counterparts. We believe that our finding that the super-elite had the greatest wage gain was a natural consequence of the progressive entrenchment of market fundamentalism. We also believe that our finding from Figure 3 that the lower half of the wage distributions of male and female wage earners did not slip (had not yet slipped?) backward in 2000-2005 reflected that this entrenchment was not (not yet?) as serious in Canada as in the U.S.

Sandel (2012) also showed a dreadful development in many parts of the world as a consequence of the spread of market fundamentalism. This ideology, by promoting the encroachment of market mechanisms into the societal spheres that used to be well guided

[7] Another name for market fundamentalism is neo-liberalism (Harvey, 2007), which may be a misleading name, because it might be taken as a new version of what is commonly understood as liberalism.

by moral and communal principles, has created many harmful effects on societies as a whole and especially on their weaker members.

In sum, in order to achieve our ideals and to make the world a better place to live, efforts against market fundamentalism must be strengthened. For being effective in these efforts, we highly recommend the books by Krugman and Stiglitz (Nobel Laureates in Economics) and Sandel (a world-renowned political philosopher), shown in the list of references.

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