The Changing Effect of Women's Education on Canadian Family Fertility Rates from 1986 to 2011

by

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Contents

Abstract

This paper seeks to update the literature on Canadian fertility, accounting for changes in women's education, immigration, and provincial differentials. Data is supplied by the Canadian Census of Population, from 1986 to 2006, and by the National Household Survey of 2011. A descriptive analysis and an OLS regression analysis are given over this twenty-five year period. Education effects on fertility are generally negative; however, women aged 35 to 50 tend to have more children when they are more educated, so the education effect may be to postpone births rather than limit the number of births. Family income effects are positive but near-zero, while female wage effects on the number of children are negative and large relative to the former. Common law attachments have a large negative effect on fertility, while immigrants tend to have higher fertility rates than native-born Canadians.

Introduction

In recent decades the Canadian population has experienced decreasing fertility rates, coupled with societal changes such as rising levels of education and increasing cultural diversity. Although it is clear that fertility rates have fallen, Canadian studies are sparse since the late 1990s, and there is little information available about which segments of the population may be driving

these changes and what the underlying factors might be. Using census data from 1986 to 2011, this paper examines how the number of children per census family has changed over time. With a focus on female education levels, income effects and wage effects, the following analysis also accounts for influences on fertility such as Canadian province of residence and immigrants' region of birth.

This paper is comprised of a literature review, a descriptive analysis of the data in each survey year, and an OLS regression analysis of the number of children per census family in each survey year. There are two age samples, women aged 25 to 50 and women aged 35 to 50, and the regression analysis is performed in two parts. The first set of regressions uses a reported female weekly wage from the data as a measure of a woman's opportunity cost of time, whereas the second set of regressions relies on a wage estimation equation and uses the subsequent predicted weekly wage.

Perhaps the most interesting results in this paper are associated with female education. There is widespread evidence in the literature of an inverse correlation between fertility and women's education (Grindstaff et al., 1991); however, the most recent studies have not demonstrated this relationship as clearly, and neither does the following analysis of Canadian census data. Given a sample of women aged 25 to 50, there is an inverse correlation between fertility and education. But among women aged 35 to 50, which serves as a proxy for a sample of women with completed fertility, the fertility-education pattern varies

between survey years and largely demonstrates that more educated women are having more children.

On the other hand, family income and female wage effects are stable and in keeping with the literature across age samples and survey years. Income effects are positive, but near-zero and declining over the period, whereas wage effects are negative and relatively large. After controlling for age, marital status, and urban or rural areas of residence, controls for province of residence are introduced to account for differential effects over Canada's vast geography. This was prompted by concerns about low fertility rates in Quebec and the unprecedented Allowance for Newborn Children, introduced from 1988 to 1997 in that province to encourage families to have more children (Milligan 2005). Lastly, as recent studies have shown that certain groups of immigrants have larger average numbers of children than their native-born counterparts (Ng and Nault 1997), the number of children per census family is also analysed according the immigrants' place of birth.

Literature Review

Traditional Theories of Fertility

In 1960 Becker laid a foundation for theories of fertility with his treatment of children as consumer durables, an investment to be considered within an economic framework. Central to his analysis was the recent availability of birth control, which granted near-perfect control over the decision to have children so that parents could choose their family size based on income, tastes, desired quality of (or investment in) each child, and the cost of children (Becker 1960).

Although higher incomes lead to a higher desired number of children in Becker's framework, the data suggested that high-income families were actually smaller and fertility in the United States was falling even as average incomes were rising. Becker suggested a few reasons for this, such as the greater use of contraception among well-educated and wealthy individuals, but his explanations were ultimately undermined (Blake 1968). While Becker accounted for the impact of a family's total income on fertility decisions, he did not incorporate the changing opportunity cost of women's time.

As women grew more educated and began to earn more in the labour market, higher incomes began to coincide with a higher opportunity cost of women's time, which opposed the income effect on childbearing. At present, a "pervasive

theme in the economics of fertility [is] the role of the female wage as an indicator of the price of time" (Ashenfelter et al. 1986, p.255) and thus the price of having children. Although econometric tests regarding the use of the female wage as a proxy for opportunity cost have not always been convincing, this measure of a woman's opportunity cost of time is now a feature of economic models of fertility (Ashenfelter at al. 1986).

Theories of fertility diverged with Easterlin and Mincer, who formed relative income models and priceof-time models respectively. Easterlin (Ashenfelter et al. 1986) sought to explain trends in fertility by incorporating differences in the incomes of young adults as compared to their parents' incomes. He reasoned that "the weights individuals place on material goods as sources of satisfaction, relative to numbers of children, are shaped by consumption experiences during adolescence" (Ashenfelter et al. 1986, p.251). Those who grew up in high-income households would be accustomed to a standard of living which would then influence them to have fewer children later in life, especially if they experience lower incomes than their parents, in order to afford their standard in material goods. Due to difficulties in generating measures of relative income from generation to generation many papers have used relative cohort size as a proxy measure, hypothesizing that a larger cohort or workforce would imply smaller wages (Abeysinghe 1991).

Taking another approach, Mincer (1962) modelled fertility and female labor supply with an emphasis on women's price of time. Labour supply depended upon potential long run family income, the wife's market wage, and other factors or tastes (such as number or age of children). Ceteris paribus, a rise in family income would tend to lower a women's labor supply, while an increase in her market wage would tend to increase her labor supply; therefore, a woman with higher wages would be less likely to spend time on "home production" such as bearing and caring for children (Mincer 1962, p.75). Mincer was concerned with distinguishing between the effects of short run or cyclical variations in male income and the effects of potential male income on female labor supply, and found that women's response to fluctuations in short run and long run income varied over the life cycle. Older women tended to respond less to short run deviations in family income by altering their labor force participation, which may be a result of families accumulating savings and other assets over time (Mincer 1962, p.78-82).

Mincer and Polachek (1974) elaborated on the interaction between female labor supply, female wages, and the opportunity cost of children. Reducing labor supply to have children imposes distinct costs which rise with a woman's wage, these costs being forgone earnings and reduced future wages. Noting that the observed wage rate is an imperfect measure of the opportunity cost of time, Mincer and Polachek nonetheless find that "observed wage rates, and even more

so, marginal prices of time… increase with education. Lesser fertility and closer spacing of children are the responses" (Mincer and Polachek 1974, p.104).

Mincer's and Easterlin's theories have been viewed as competing, and yet neither of them has been able to adequately explain changing patterns of fertility in the 20th and 21st centuries (Macunovich 1996). Macunovich presents an excellent overview and synthesis of these two models which have dominated the literature on fertility, finding that a combination of the two offers a much better prediction of fertility rates. She incorporates both female wages and male relative cohort income to explain 99% of all variations in fertility, albeit in a small time series sample, finding that when relative male incomes are lower female wages have a larger positive effect on fertility. Her work suggests that both relative cohort income and the female wage are useful in modelling fertility.

The Recent Literature

Becker's consumer demand theory continues to inform the study of fertility, and it may be said that in broad terms fertility is affected by income, the cost of children, the price of goods related to children, tastes and preferences, and technology (Benjamin et al. 2007). With the prevailing assumption that children are normal goods, Becker posited a positive relationship between family income

and a family's desired number of children – whereas there is a negative relationship between the price of children and the desired number of children.

However, empirical evidence demonstrates an overall negative relationship between income and the number of children in a family, (Benjamin et al. 2007, p.129). Wealthier countries and families are associated with smaller families, and economists have concluded that this follows from the higher earnings potential of women in high-income countries and families, whose opportunity cost of having children inflates the price of bearing and raising a child. A woman's educational attainment, being indicative of her earnings potential, has become a key predictor of fertility (Grindstaff et al. 1991). Moreover, education may influence tastes, encouraging greater investment in the quality of fewer children, or alternately, "self-fulfillment through other means than having children" (Benjamin et al. 2007, p.130).

As shown by the following table from Grindstaff et al. (1991), who employs data from the Canadian Fertility Survey of 1984, 38.7% of women with less than eight years of schooling had four or more children. In contrast, only 11.4% of women with 14 or more years of schooling had four or more children. These highly educated women were also three times more likely not to have any children than their least educated counterparts.

Education also plays a role in marriage and family formation in the sense that individuals tend to marry those with similar educational achievements, so

that a woman's potential earnings are likely correlated with her husband's income (Grindstaff et al. 1991, p.326). These two variables theoretically have opposing effects on fertility.

Table 1: Distribution of women by children born and education

TABLE V
PERCENTAGE DISTRIBUTION OF WOMEN 35–49 BY CHILDREN EVER BORN AND EDUCATION – CFS 1984

Education (Number of Years of Schooling)	*Number of Children*					*Mean Nr. of Births*	*Nr. of Women*
	0	*1*	*2*	*3*	*4+*		
≤ 8	5.9	9.4	17.1	28.8	38.7	3.26	290
9–11	7.7	10.8	28.7	29.4	23.4	2.74	584
12–13	10.3	13.9	35.7	25.3	14.8	2.25	623
≥ 14	18.6	10.8	38.5	20.7	11.4	2.00	585
Total	11.2	11.5	32.0	25.7	19.6	2.46	2082

Source: *Grindstaff et al. (1991)*

As levels of education rise, marriage and age at first birth are delayed (Benjamin et al. 2007). Women with superior education and earnings potential tend to have fewer children, to marry and have their first child later in life, to space births more closely together, and to have fewer children overall. Therefore, in addition to fertility levels, age at first birth and the length of intervals between births have become key variables of interest in the literature (Cain and Weininger 1973). However, there is evidence of a changing trend in age at first birth which could render it less interesting. Grindstaff et al. (1991) hypothesize that age at first birth is becoming a less and less significant indicator of completed fertility. Whereas a woman with high school education may have her first child much

sooner than a women who completes a university degree, "the norm of low fertility is becoming so pervasive" (Grindstaff 1991 et al., p.329) that these women will likely have the same family size and differ only in the timing of their births.

There is also evidence on the international scale of a changing relationship between female labour force participation and fertility. Although higher female education, wages, and labour force participation have historically been associated with lower fertility (Ashenfelter et al. 1986), Brewster and Rindfuss (2000) show that as of the mid-1990s higher female labour force participation is correlated with higher fertility among the countries of the European Union, the United States, Canada, Australia, and Japan. It is notable that "the relative positions of most countries have changed little" (Brewster and Rindfuss 2000, p.278), with Sweden, Finland, Denmark, and the United States displaying the highest rates of female labor force participation in both 1970 and 1996, even as Italy, Spain, and Greece consistently had the lowest rates of female labour force participation.

Brewster and Rindfuss (2000) do not question that at the individual level there will be an inverse relationship between labour force participation and fertility. Rather, the culture and social policies of different countries substantially influence how much time a woman must spend away from work in order to bear and raise a child; for example, in Japan norms dictate that new mothers leave the labor force for a decade or more (Brewster and Rindfuss 2000, p.280). The

availability and acceptability of childcare in the United States and Scandinavia are at a sharp contrast to the latter environment. In addition to these factors, Brewster and Rindfuss state that marital status, the age and number of children, educational background, and type of employment influence the fertility and labour supply decisions of mothers.

This paper by Brewster and Rindfuss leads into two important points: one is the interdependence of fertility and women's labour supply decisions, and the other is the manner in which fertility rates vary by country.

Firstly, McNown has written extensively on problems of cointegration in analyses of fertility, focusing on an empirical methodology. Fertility decisions affect labor supply decisions (and vice versa), just as Mincer theorized, and it may be necessary to use cointegration techniques to obtain reliable results in a model of fertility. McNown (2003) focuses on the likely endogeneity of the principal determinants of fertility, namely female education, wages, and labour force participation. He proposes the use of cointegration techniques in order to address bias and underspecification. Using U.S. time series (census) data and the cointegration model of Johansen (1995), McNown obtains results that are consistent with economic theories of fertility and female labour market participation.

In a similar vein, McNown and Ridao-cano (2004) applies cointegration techniques to Canadian data, finding long run relationships between fertility,

female labour supple, female wages and education, male incomes, and child benefits. The authors include child benefits in the model specification to accommodate pro-natal policies in Canada, which first began in 1918. However, they conclude that child benefits do not significantly impact fertility, which is not overly surprising considering that child benefits do not figure widely in the literature.

Secondly, the manner in which fertility levels can vary dramatically by country introduces another factor in modelling fertility, which is accounting for differing fertility behaviour among immigrants. In the United States, for instance, there has historically been a difference between native-born and immigrant fertility rates. This gap rose during the 1980s, which Kahn (1994) attributes to native fertility rates falling much more rapidly than their immigrant counterparts. She explains the relatively high fertility of immigrants through differences in age, education, income, and ethnicity, noting that ethnicity has become more important since immigrants began to arrive from high-fertility countries in the 1970s (Kahn 1994, p.502) . In particular, the number of immigrants from Mexico and Southeast Asia increased quite substantially.

Immigrants' higher fertility may not simply be attributed to culture, but also to education, income, and skills. Kahn (1994) brings attention to the declining "selectivity" which accompanied the increase in immigration from high-fertility countries, pointing out that less stringent immigration requirements

allow for a greater number of immigrants with lower education and greater expected fertility rates. This also contributes to higher fertility levels among immigrants as compared to the native-born population.

One point which Kahn (1994) mentions, and Ford (1990) elaborates upon, is that "the characteristics of the immigrant population should approach the characteristics of the native born population" (Ford 1990, p.34) after a sufficient period of residence. It is generally accepted that if an individual immigrates before the age of 15 they will mature similarly to the native-born population, and Woldemicael and Beaujot (2012) state that the age at which a woman immigrates has a profound impact on her fertility. Women who arrive before the age of 15 are likely to experience assimilation and have their fertility decisions shaped by the host society (Woldemicael and Beaujot 2012). When accounting for immigrant status and ethnicity in models of fertility, it is therefore considered acceptable to group those who immigrated at a young age with the native-born population.

The Canadian Literature

Many recent studies of immigrant fertility behaviour are in fact Canadian. Foreign-born Canadians historically had lower fertility rates than native Canadians, and one study by Ram and George (1990) is concerned with discovering whether lower fertility precedes or follows immigration. It is possible

that immigration temporarily disrupts fertility, after which immigrants will experience normal or even slightly accelerated rates of fertility – this is the disruption hypothesis. Ram and George found evidence of the disruption hypothesis when studying Canadian data between 1961 and 1986. Accounting for disruptions in fertility, immigrants still had lower overall fertility than native born Canadians during this time period.

This is in direct contrast to Ng and Nault's (1997) more recent work, which finds no trace of the disruption hypothesis among women who immigrated from 1986 to 1991. And although immigrants once had lower fertility rates, lately they have had more children than their native-born Canadian counterparts. Changes in the socioeconomic status and region of origin of immigrants could be responsible for the rise of immigrant fertility, just as supposed by Kahn (1994) in the US case, and these possibilities are investigated in the present paper.

Interestingly, Ng and Nault (1997) do not find evidence that socioeconomic factors or region of origin reversed the historical trend of low immigrant fertility. Instead, the authors explain that the superior "own-infant" method, as opposed to the "own-child" method of accounting for births, has allowed for more precise estimates of current fertility. This presents the possibility that the changing differential between immigrant and native-born fertility may be a technical matter. However, fertility rates among immigrants do

differ by region of birth, with the highest fertility rates among South Asians and the lowest fertility rates among East Asians (Ng and Nault 1997, p.569).

Woldemicael and Beaujot (2012) corroborate Ng and Nault's findings while going into more detail about immigrants' region of origin and visible minority status. The authors state that, although fertility differs by place of origin, with especially low rates among Chinese and high rates among Africans and South Asians, once controls are imposed for socioeconomic factors the effect of birthplace become very small. Furthermore, when studying three successive generations of immigrants, differences in fertility by generation disappear given controls for visible minority status, acculturation, maternal age, education, and marital status. Woldemicael and Beaujot suggest that traditional socioeconomic factors, such as education and marital status, as well as the degree to which immigrants are integrated with their ethnic community or with Canadian society, are what cause differences in fertility.

There has also been work with Canadian data with respect to Easterlin's and Mincer's models of fertility. Although there is evidence that both relative income and the price of time are useful in explaining fertility, when Abeysinghe (1991) tested a variation of Easterlin's theory with Canadian time series data he did not find an equilibrium relationship between relative cohort size and fertility. Abyesinghe adds that relative cohort size may be a poor proxy for relative cohort income, and that Easterlin's hypothesis should not be rejected based on his

findings. But because it is difficult to form any measure or proxy for relative income this variable will not be included in my analysis of the Canadian censuses and National Household Survey later in this paper. It is also worth mentioning that variations on Mincer's model, which emphasize family income and female price of time, feature much more widely in the literature.

One consideration which is uniquely Canadian is the cultural differences between provinces, especially the province of Quebec, which has experienced lower fertility rates in recent times. Quebec is the only province to have instituted subsidized childcare, and it also receives attention from economists due to its Allowance for Newborn Children (ANC), which was implemented between 1988 and 1997 in an effort to encourage larger family sizes. Milligan (2005) takes advantage of this natural experiment to study the effects of family policy on fertility. He does not find significant increases in fertility that could be attributed to the ANC, although Duclos et al. (2001) arrive at more positive results. The effects of the ANC remain unclear, but I will experiment with a dummy variable for the ANC's effects in Quebec over 1988 to 1997 in addition to provincial dummy variables.

Data

This study employs data from the Canadian Census of Population from 1986 to 2006, as well as the Canadian National Household Survey (NHS) from 2011, in which year the NHS replaced the relevant information from the long form census. These are master files rather than public use files, and require use of the census family files for information on family income. The 2011 NHS is relatively consistent with the censuses, and in fact the coding of the 2001 census poses the most problems in the empirical analysis which follows.

The microdata files provide many millions of observations, and the raw data samples are reduced in several ways. First, only records for women between the ages of 25-50 are retained. A second descriptive and empirical analysis follows for women between 35-50 years of age in an effort to study the completed number of children per census family, as well as completed levels of education in the sample. Observations from the northern provinces and territories, as well as institutional residents, are dropped. These comprise a small fraction of the population, and furthermore, this study is most interested in the behaviour of the bulk of Canadians, who live nearer the southern border.

Various years of the censuses differ in terms of the information provided in the microdata files. 1986 does not record common law unions, which are distinguished from marriages in the empirical analysis in an effort to clarify

fertility behaviour in Quebec, where common law unions are much more widespread. In 1986 the effect of common law unions on the number of children per census family cannot be studied. Then, in 1991 an indicator for common law marriages had to be constructed from two other variables; one of which was coded for married, and the other of which was coded for married or common law. The indicator was imputed from the difference between these two variables.

Earlier census years also present difficulties when determining area of residence. In addition to province of residence, census families are classified according to residence in rural/small town areas, medium-sized urban areas, and large urban areas. Census Metropolitan Areas (CMAs) are employed to classify families in this way. However, for census years 1986-1996, there is a fraction of observations for which CMA is simply listed as "Not Applicable". In these three censusyears a dummy for unknown area of residence is introduced, whereas in later years this is not necessary.

Most importantly, the 2001 census codes the number of children per census family differently than in other years, truncating the variable at 5 or more children. To improve consistency, the number of children is truncated at 5 in all other census years and in the NHS. It would be necessary to truncate the number of children at some point, regardless of the construction of the 2001 census, because the years 1986-1996 have a small number of observations for which there are unrealistically high numbers of children per census family. A maximum of 5

children per census family imposes changes only on small portions of each sample.

A descriptive analysis of the data follows for all census years, first with the sample of women aged 25-50, and then with the sample aged 35-50.

Descriptive Analysis

The following analysis is interested in the number of children per census family, principally with reference to female education, but we will also look at immigrants' region of birth, and Quebec residency. Fertility rates in Canada have fallen over time and this has been accompanied by changes which are of interest in this context. Since 1986 women have pursued education to a greater degree, which is indicative of higher earnings potential and thus a higher opportunity cost to having children. Also, since 1986 the source-country composition of the Canadian immigrant population has changed, and it bears investigation into whether this may be contributing to overall fertility levels. Finally, the substantial subsidies of the Allowance for Newborn Children (ANC) hint that Quebec may have experienced lower fertility rates than the rest of Canada, and this also bears investigation.

Observations are grouped by education consistently over time according to the highest level of education attained. These levels are less than high school, high school diploma, CEGEP or college or a degree/certificate below the Bachelor's level, Bachelor's degree, and advanced degree (which include medicine, dentistry, etc.).

When grouping observations by region of birth, women who immigrated before the age of 15 are considered to be Canadian born. This assumption is supported by the literature (Woldemicael and Beaujot, 2012), which generally finds that those who immigrate before their early teens grow up to be very similar to native-born citizens. Therefore, when studying the number of children per census family by region of birth only those who immigrated later in life are classified according to the following categories:

- USA
- South and Central America
- Northern and Western Europe, Australia, and New Zealand
- Eastern and Southern Europe
- The Middle East
- Africa
- South and Southeast Asia
- East Asia

Studying the mean number of children in samples of women aged 25 to 50 (a proxy for overall fertility), and 35 to 50 (a proxy for completed fertility) yields a few interesting results. The declining mean number of children as educational levels rise, evidenced by the 25 to 50 year old sample, may be a result of the timing of births rather than desired number of children. More highly educated women show higher mean numbers of children in the sample aged 35 to 50, whereas there is a much smaller difference for their less educated counterparts. There is also a slightly larger gap between the mean number of children in Quebec and the rest of Canada when one considers the 35 to 50 year old sample.

Sample Aged 25-50

For each survey year the sample consists of women aged 25 to 50, excluding those in the Northern provinces and territories. Although the woman in a census family may not necessarily be the mother of (all) the children in that family, there is no variable in the census or NHS which provides a means of identifying a mother-child link. Critically, we assume that the number of blended families is not so large as to skew the descriptive statistics. The appropriate census weights are used when describing the number of children per census family according to women's educational attainment, place of birth (Canada or elsewhere), and

residence in Quebec versus the rest of Canada (ROC). These weights are compw5 in the 1986 and 1991 censuses, and compw2 in all other years.

Overall, the number of children per census family among these observations for women aged 25 to 50 has declined from a mean of 1.675 in 1986 to a mean of 1.521 in 2011. However, in 2011 the mean number of children did not fall compared to 2006, and this could indicate that the number of children might be stabilizing. These statistics are shown in **Table 2**. Although this sample gives an impression of the mean number of children in any given census family, it should be noted that this does not indicate desired or completed fertility levels.

Table 2: Mean Number of Children per Census Family from 1986-2011, Sample Aged 25-50

Mean Number of Children Among Canadian Women Aged 25-50						
	1986	*1991*	*1996*	*2001*	*2006*	*2011*
Mean number of children	1.675	1.575	1.579	1.268	1.522	1.521

Given that the number of children is truncated at 5 or more, the following histograms (**Figures 2 to 7**) approximate the distribution of the number of children for women aged 25 to 50. Since 1986 the proportion of women with no children has risen, showing a very high spike in 2001. This could be the reason why the summary statistics for 2001 are out of line with other years, but this variable was coded by Statistics Canada and so it will be reported as is. Meanwhile, the only change made to the data in other years was to set all (non-

missing) values for the number of children which were greater than five, as equal to five.

Aside from this, it is notable that the modal number of children (if any) is two, and the fraction of the sample which had 5 or more children is very small in every survey year. This demonstrates that relatively few observations were affected by the truncation of the number of children at 5.

Figure 2

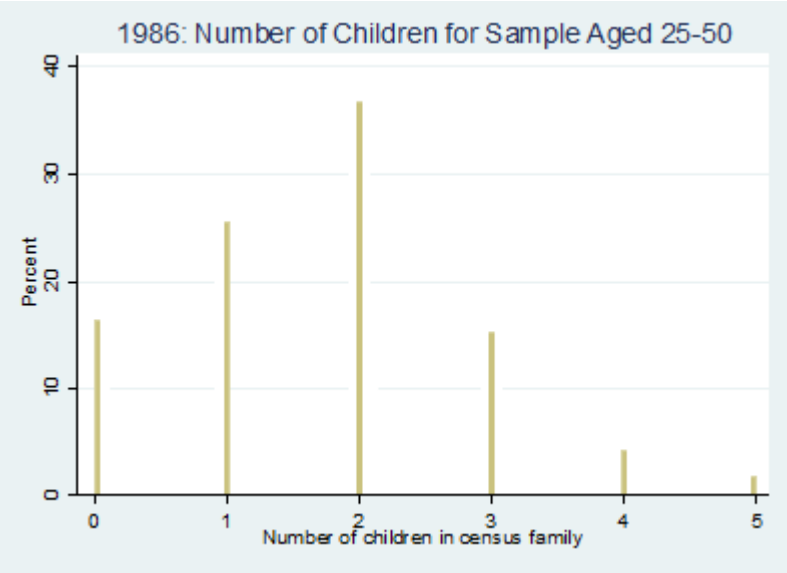


Figure 3

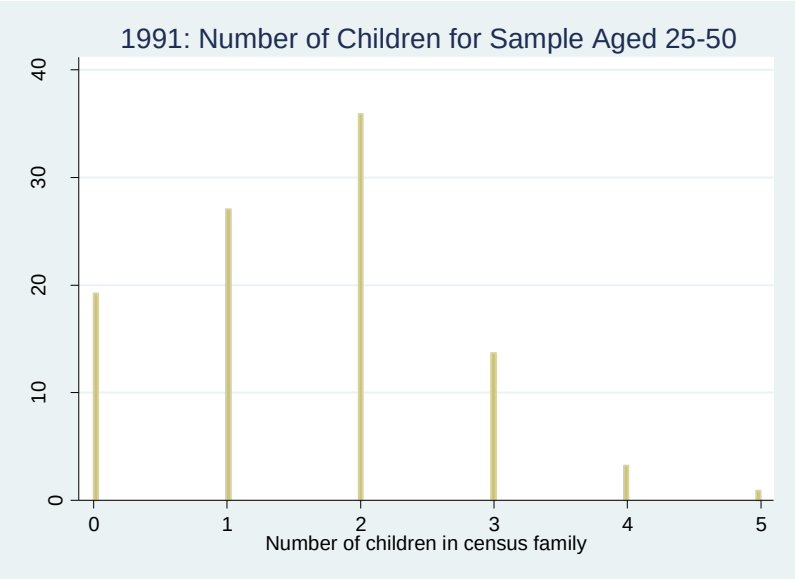


Figure 4

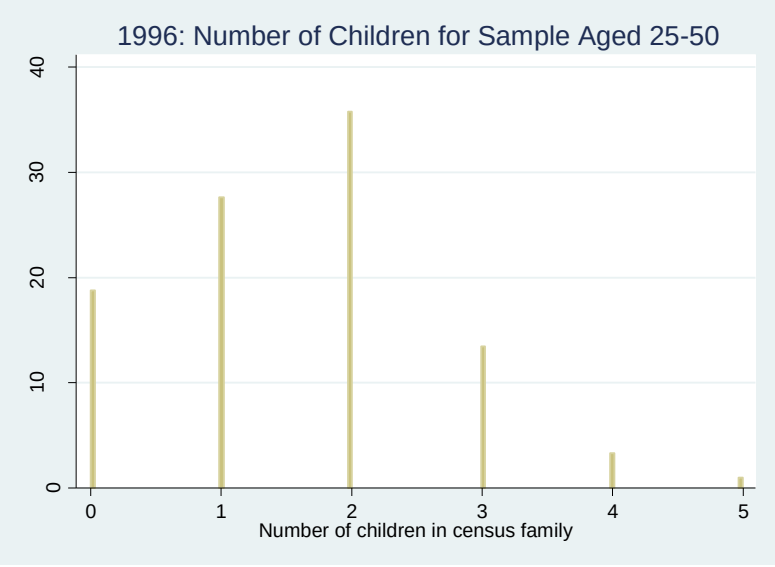


Figure 5

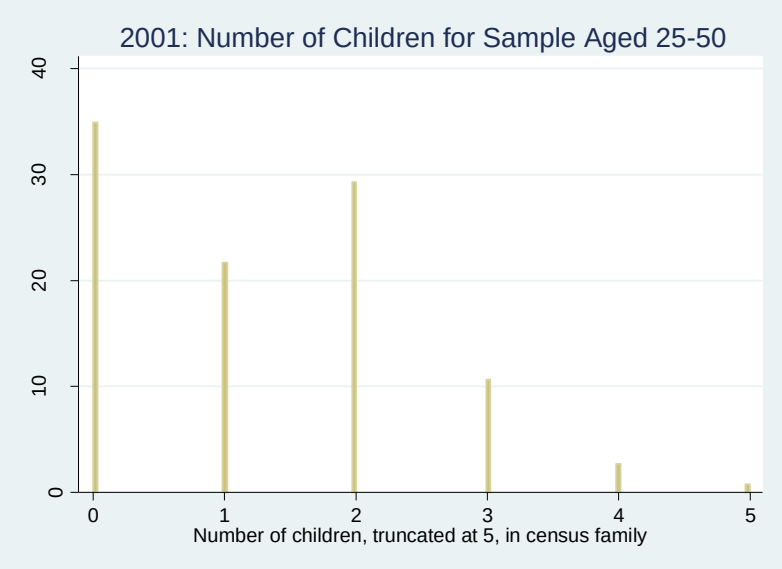


Figure 6

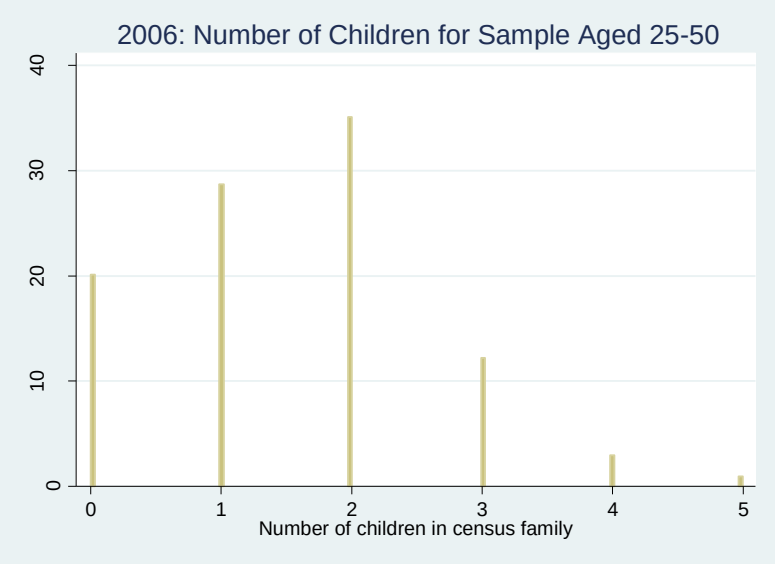
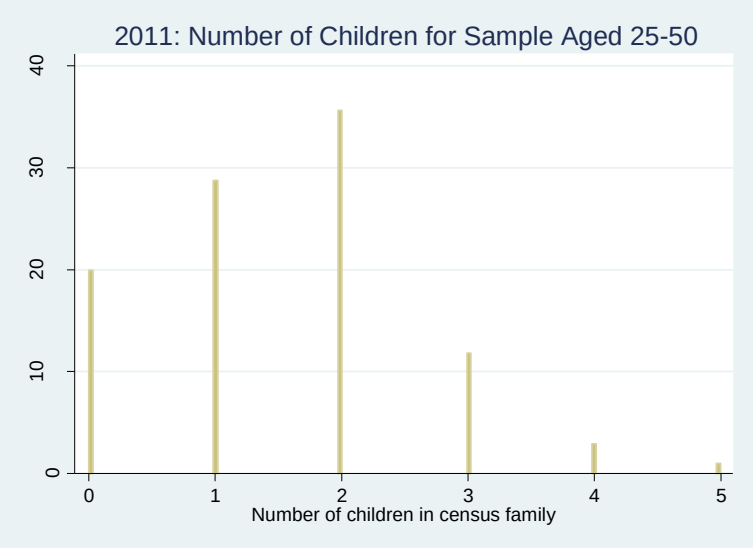


Figure 7



It is immediately clear that a significant change has occurred in the educational levels of women since 1986. As shown in **Table 3**, the percentage of the sample with less than a high school diploma fell from 36.87% in 1986 to 8.95% in 2011. At the other end of the distribution the number of women with advanced degrees rose from just 3.45% to 10.55%, while, as early as 1991, college became the most prevalent highest level of education attained. Note that "College" also includes the trades, those who have completed some CEGEP, and those who have completed a certificate, degree, or diploma below the Bachelor level. An "advanced degree" includes those who have completed a certificate, degree, or diploma above the Bachelor's level.

Table 3: Educational Attainment of Canadian Women, Sample Aged 25-50

Educational Attainment of Canadian Women Aged 25-50						
	1986	*1991*	*1996*	*2001*	*2006*	*2011*
Less than high school	36.87%	27.64%	22.65%	19.01%	11.36%	8.95%
High school	23.46%	26.83%	25.94%	24.09%	23.68%	20.74%
College	27.45%	30.69%	33.51%	35.24%	38.68%	38.72%
Bachelor's degree	8.77%	10.38%	12.54%	15.11%	17.86%	21.03%
Advanced degree	3.45%	4.47%	5.36%	6.55%	8.42%	10.55%

Higher levels of education are associated with a higher opportunity cost of time, and in turn with lower fertility. Education thus has a direct effect on fertility as well as an indirect effect through women's earnings. It is tempting to assume that Canada's falling fertility rates have been due, in some measure, to these increases in women's educational attainment. However, **Table 4** shows that the number of children per census family has declined for all levels of female education excepting those with Bachelor's and advanced degrees. Note that the descriptive statistics for the year 2001, in which the number of children per census family had already been truncated at 5 by Statscan, should be treated with caution; 2001 shows a much lower mean number of children than the years preceding or following, and it is difficult to know to what extent this reflects real changes in fertility. Although the methodology used to truncate the number of children in every other year at 5 appears to match the 2001 coding, the codebooks are very terse. In this analysis 2001 is used more to compare relative mean numbers of children within educational categories than with other survey years.

Table 4: Number of Children per Census Family by Female Educational Attainment, Sample Aged 25-50

1986	***Mean number of children***	***Standard deviation***	***Kurtosis***
Sample	1.675	1.117	2.946
Less than high school	1.808	1.152	2.997
High school	1.646	1.066	2.936
College	1.617	1.087	2.852
Bachelor's degree	1.432	1.119	2.684
Advanced degree	1.378	1.101	2.687
1991	*Mean number of children*	*Standard deviation*	*Kurtosis*
Sample	1.575	1.099	2.865
Less than high school	1.667	1.138	2.980
High school	1.613	1.068	2.896
College	1.525	1.076	2.772
Bachelor's degree	1.421	1.122	2.622
Advanced degree	1.394	1.091	2.579
1996	*Mean number of children*	*Standard deviation*	*Kurtosis*
Sample	1.579	1.100	2.929
Less than high school	1.667	1.154	3.032
High school	1.631	1.070	2.980
College	1.547	1.071	2.860
Bachelor's degree	1.445	1.114	2.660
Advanced degree	1.423	1.095	2.697
2001	*Mean number of children*	*Standard deviation*	*Kurtosis*
Sample	1.268	1.167	2.669
Less than high school	1.394	1.229	2.815
High school	1.378	1.156	2.635
College	1.266	1.138	2.587
Bachelor's degree	1.042	1.141	2.691
Advanced degree	1.026	1.113	2.679
2006	*Mean number of children*	*Standard deviation*	*Kurtosis*
Sample	1.522	1.091	2.992
Less than high school	1.658	1.207	3.097
High school	1.574	1.087	3.017
College	1.521	1.061	2.955
Bachelor's degree	1.422	1.080	2.716
Advanced degree	1.390	1.061	2.766
2011	*Mean number of children*	*Standard deviation*	*Kurtosis*
Sample	1.521	1.086	3.057
Less than high school	1.700	1.237	3.078
High school	1.566	1.097	3.094
College	1.524	1.052	3.017
Bachelor's degree	1.448	1.071	2.753
Advanced degree	1.400	1.050	2.786

Overall, the mean number of children among census families containing a woman aged 25-50 fell from 1.671 in 1986 to 1.521 in 2011. Women with less than high school had a mean number of 1.808 children in 1986, which fell as low as 1.658 in 2006 and rested at 1.700 in 2011. Women with high school had a mean of 1.646 children in 1986, down to 1.5766in 2011. Those with a college level education show a mean number of children that declined from 1.617 to 1.524.

Conversely, those with a Bachelor's degree had 1.432 children in 1986 and 1.448 children in 2011, while those with advanced degrees had 1.378 children in 1986 and 1.400 children in 2011. These trends are accentuated in the sample aged 35 to 50 (to be considered below).

Despite the distribution of children being truncated at 5 or more, it is interesting to note that women with less than high school education always display the highest kurtosis (or incidence of extreme values), which then declines as educational levels rise. Regardless of changing mean numbers of children, women with less education remain more likely to have a higher, outlying number of children, than their more educated counterparts. And before the data were truncated for consistency this difference was much more marked.

Tables A1 to **A6** in Appendix A demonstrate how the size and composition of the immigrant population have changed among women aged 25 to 50, and display the mean number of children by place of birth. Recall that

women are counted as immigrants only if they arrived in Canada at age 15 or older. Native-born women as a percentage of the population have decreased somewhat, from 86.13% to 80.09%, and they had a mean number of children of 1.646 in 1986 (below the full sample average of 1.675) versus a mean number of children of 1.476 in 2011 (below the full sample average of 1.521). (The gap in the mean number of children among native-born women and the entire sample population proves different in the sample of women aged 35 to 50.)

Immigrants from the United States are distinguished from those from other western countries, namely Western or Northern Europe, Australia and New Zealand[1]; and Americans show higher mean numbers of children than the latter group. Women aged 25 to 50 from western countries other than the United States tend to have the same number of children as native-born women. These first two immigrant groups decline as a percentage of the full sample. Those from the United States fall from 0.94% to 0.41%, and those from other western countries fall from 3.33% to 1.12%.

Whereas most immigrants were originally from Western or Northern Europe, Australia and New Zealand, or from Southern or Eastern Europe, by 2011 most immigrants were born in Asia. Immigrants from Southern or Eastern Europe had mean numbers of children comparable to those from Asia in 1986, and all had numbers of children much higher than native-born women or the

[1] Ng and Nault (1997) distinguish between immigrants from the United States and other western countries, as do Woldemicael and Beaujot (2012).

sample overall. But by 2011 the fertility of women from Southern or Eastern Europe declined to a mean of 1.444 children, and only women from Eastern Asia had fewer children on average, at 1.386. On the other hand the South and Southeast Asian population continued to have higher mean numbers of children than the sample mean, at 1.790 in 2011.

By 2011 the highest mean numbers of children are found among Middle Easterners and Africans, and both of these groups increased as a percentage of the full sample population. In 1986 Middle Easterners had 2.017 children on average, and Africans had 1.817 children; this compared to 25 years later, with Africans having the highest mean numbers of children at 2.042, and Middle Easterners having 1.982. Since the immigrant groups with the highest fertility will be seen to differ in the sample of women aged 35-50, Middle Eastern and African immigrants may be more likely to have children earlier, although they might not have the highest completed fertility.

The main points of interest from this analysis according to place of birth are as follows: consistently higher mean numbers of children among American immigrants, a noticeable drop in fertility among Southern or Eastern Europeans and East Asians, and the much higher mean numbers of children among Middle Eastern, South and Southeast Asian, African, and Latin American immigrants.

Ng and Nault (1997) found that controlling for other socioeconomic factors, such as marriage, education, and income, almost eliminated fertility differentials

by place of birth. The following regression analysis is not as sophisticated as their analysis, and is not specifically focused on immigrant fertility, and the results do not conform to Ng and Nault's findings despite controls for major determinants of fertility. Immigrants' places of birth nearly always enter significantly, and have relatively large coefficients.

Finally, the sample aged 25 to 50 is divided or stratified according to residence in Quebec or the rest of Canada, in an effort to see whether concerns about low fertility in Quebec, which motivated policies such as the ANC (from 1988-1997), are reflected in the census data. As shown by **Table A7**, in Appendix A, Quebec does display lower mean numbers of children than the rest of Canada, there being a difference as large as 0.111 children in 1991 and as small as 0.055 in 2011. These gaps are not as large as those between native-born Canadians and many immigrant groups which were just examined, but they could be the grounds for the ANC.

Sample Aged 35-50

The sample aged 35 to 50 aims to give an impression of completed fertility. As shown in **Table 5** below, the mean number of children among women aged 35 to 50 fell from 1.802 in 1986 to 1.631 in 2011, a difference of 0.171 children as opposed to a difference of 0.154 children in the sample aged 25 to 50. This would

imply that completed family sizes may have fallen by slightly more than the mean number of children in any given census family. However, since the average age at first birth has been rising, the sample aged 35 to 50 may contain a larger share of women who have not completed their fertility in 2011 than it did in 1986; this could be amplifying the apparent decrease in completed family sizes.

Table 5: Mean Number of Children per Census family from 1986-2011, Sample Aged 35-50

Mean Number of Children Among Canadian Women Aged 25-50						
	1986	*1991*	*1996*	*2001*	*2006*	*2011*
Mean number of children	1.802	1.669	1.660	1.418	1.616	1.631

In comparison to the sample of women aged 25 to 50, the educational distribution of women aged 35 to 50 is skewed slightly toward lower levels of education (**Table 13**). Yet there is the same trend over the years 1986-2011: falling mean numbers of children which seem to stabilize in 2006 and 2011 (**Table 12**), a substantial decrease in the percentage of women without high school, and increases in the percentage of women with higher levels of education, particularly college. The slightly lower levels of education among women aged 35-50 are likely just a reflection of progressive increases in female educational attainment, such that younger women have more and more education than their predecessors.

Figures 8 to 13 approximate the distribution of the number of children in each survey year for this sample of women aged 35-50. Compared to the

distributions of children for women aged 25-50, there are far fewer women with no children and more women with two children. 2001 still shows a relatively high number of women with no children. Otherwise, the shape of the distribution is quite similar from year to year.

Figure 8

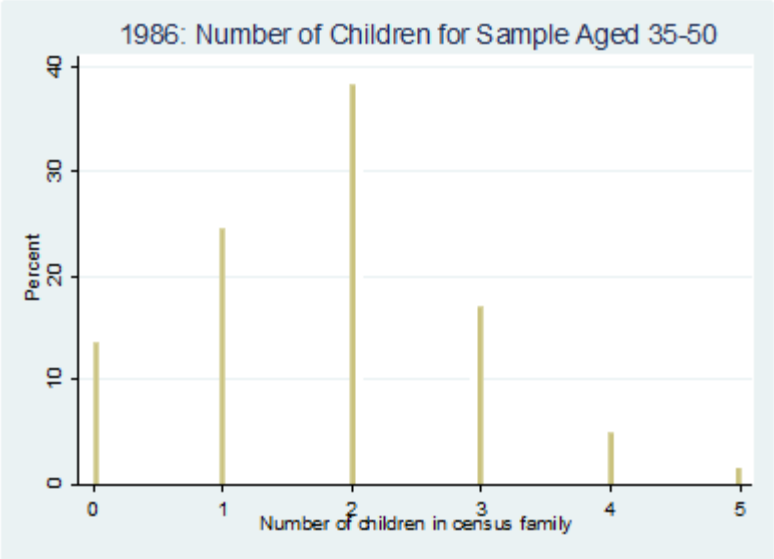


Figure 9

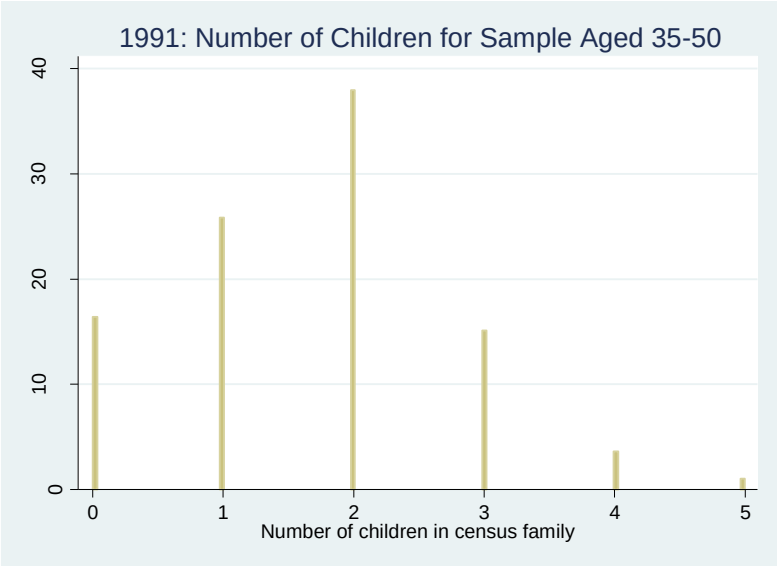


Figure 10

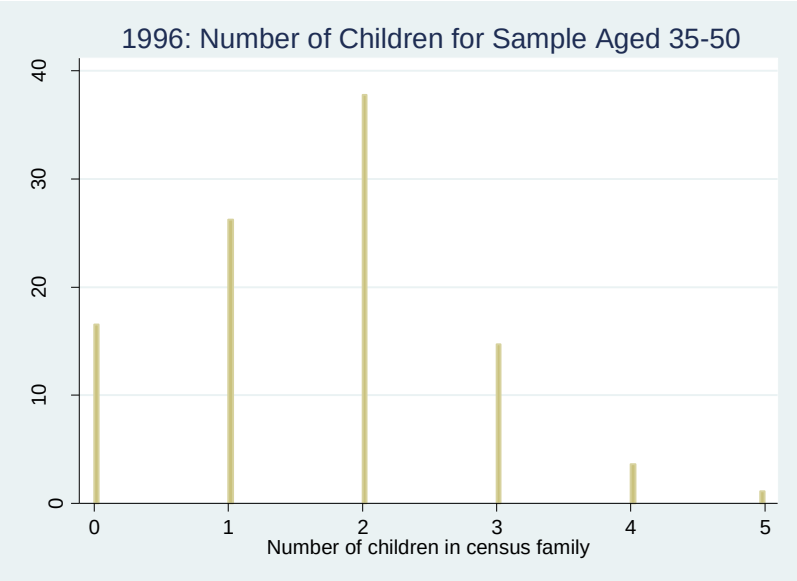


Figure 11

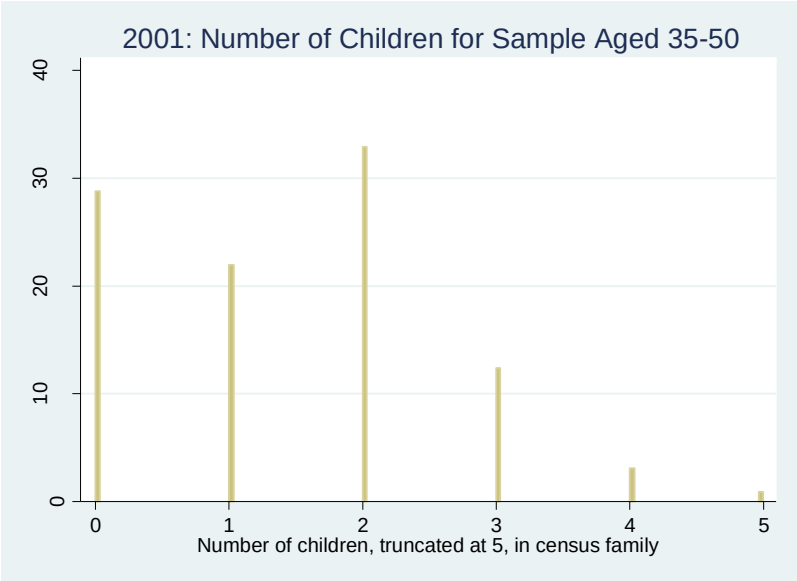


Figure 12

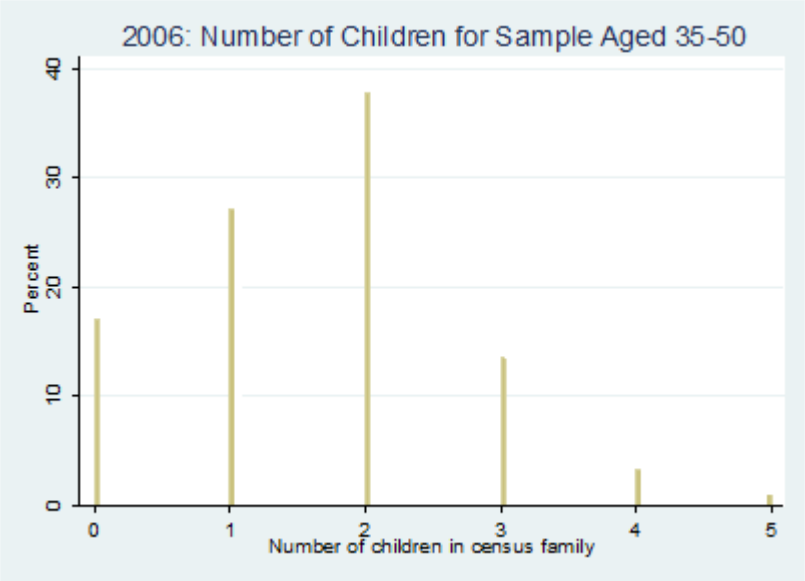
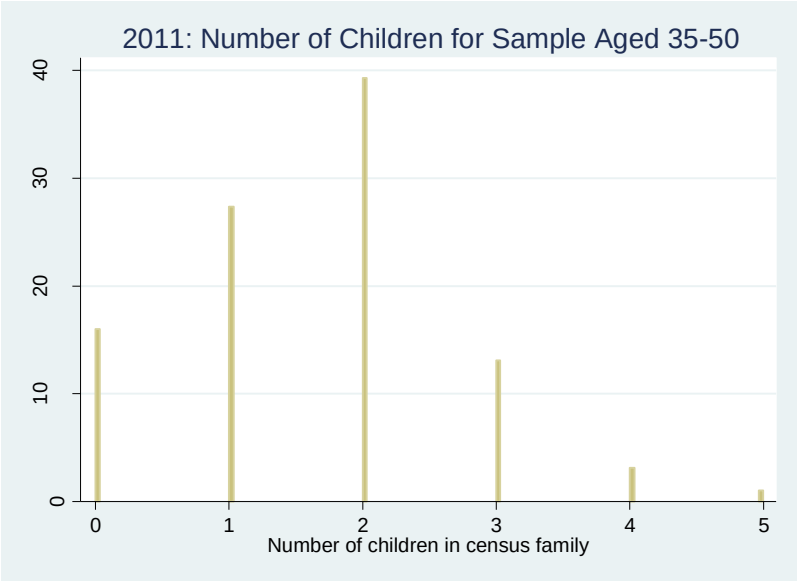


Figure 13



The sample aged 35-50 had more women without high school diplomas in 1986, 42.06% versus 36.87% in the full age sample (see **Table 6**). However, by 2011 a mere 9.75% of women aged 35-50 did not have high school diplomas (versus 8.95% in the full age sample).

Table 6: Educational Attainment of Canadian Women, Sample Aged 35-50

Educational Attainment of Canadian Women Aged 25-50						
	1986	*1991*	*1996*	*2001*	*2006*	*2011*
Less than high school	42.06%	30.49%	24.86%	20.90%	12.50%	9.75%
High school	20.42%	36.21%	26.77%	25.70%	25.45%	21.86%
College	26.64%	29.26%	32.17%	34.74%	39.10%	39.89%
Bachelor's degree	7.28%	9.11%	10.63%	12.42%	15.09%	18.58%
Advanced degree	3.59%	4.94%	5.57%	6.25%	7.86%	9.93%

Although there was a dramatic increase in women with high school diplomas between 1986 and 1991, those with high school diplomas then declined

as a portion of the sample while those with college, trades, or CEGEP education became most common.

The mean number of children by female educational attainment for those aged 35-50, shown in **Table 7**, shows some very interesting results. Mean numbers of children are higher for this sample, confirming that women are having children later in life. The sample average is 1.802 children per census family in 1986, as compared to the average of 1.675 children among women aged 25-50 in 1986. A key difference in the sample aged 35-50 is that the wider age sample displayed a mean number of children that fell as educational attainment rose, which is consistent with the theory that rising opportunity costs depress fertility. However, this inverse relationship between education and the mean number of children does not persist among mature women.

In 1986, the mean numbers of children per census family were very nearly identical for women with less than high school through to those with a Bachelor's degree. And by 1991, women with Bachelor's degrees were having the most children on average, 1.755 as compared to 1.615 children among women with less than a high school diploma. Even more surprising is that from 1991 to 2011 (excepting 2001) women with advanced degrees had more children than their least educated counterparts, without high school diplomas.

Table 7: Number of Children per Census Family by Female Educational Attainment, Sample Aged 35-50

Number of Children per Census Family by Female Educational Attainment				
1986		*Mean number of children*	*Standard deviation*	*Kurtosis*
	Sample	1.802	1.124	2.983
	Less than high school	1.813	1.189	2.914
	High school	1.787	1.066	3.016
	College	1.816	1.073	2.998
	Bachelor's degree	1.802	1.074	2.917
	Advanced degree	1.645	1.081	2.805
1991		*Mean number of children*	*Standard deviation*	*Kurtosis*
	Sample	1.669	1.095	2.918
	Less than high school	1.615	1.152	2.960
	High school	1.692	1.062	2.966
	College	1.687	1.067	2.877
	Bachelor's degree	1.755	1.082	2.870
	Advanced degree	1.620	1.065	2.738
1996		*Mean number of children*	*Standard deviation*	*Kurtosis*
	Sample	1.660	1.096	2.952
	Less than high school	1.605	1.162	3.025
	High school	1.683	1.068	3.003
	College	1.660	1.071	2.902
	Bachelor's degree	1.748	1.082	2.853
	Advanced degree	1.636	1.078	2.808
2001		*Mean number of children*	*Standard deviation*	*Kurtosis*
	Sample	1.418	1.166	2.616
	Less than high school	1.359	1.219	2.869
	High school	1.468	1.149	2.654
	College	1.418	1.145	2.548
	Bachelor's degree	1.450	1.175	2.390
	Advanced degree	1.342	1.143	2.395
2006		*Mean number of children*	*Standard deviation*	*Kurtosis*
	Sample	1.616	1.081	3.017
	Less than high school	1.572	1.197	3.168
	High school	1.597	1.089	2.993
	College	1.615	1.058	2.983
	Bachelor's degree	1.690	1.043	2.943
	Advanced degree	1.621	1.036	2.919
2011		*Mean number of children*	*Standard deviation*	*Kurtosis*
	Sample	1.631	1.063	3.127
	Less than high school	1.63	1.226	3.182
	High school	1.59	1.089	3.087
	College	1.613	1.039	3.080
	Bachelor's degree	1.713	1.018	3.092
	Advanced degree	1.643	1.006	3.053

Women with Bachelor's degrees continued to have the most children, with 2001 being an exception again. By 2006 and 2011 the educational levels with the highest mean numbers of children were women with Bachelor's degrees, followed by women with advanced degrees, then followed by women with college degrees. Unlike the sample aged 25-50, this does not indicate a clear correlation between education and mean number of children.

One possible explanation for this behavior could be that, although the opportunity cost of having children rises with education, as incomes also tend to rise with education an own-income effect is incentivizing more educated women to have more children. Alternately, there could be a family-income effect at play, as women with more education are more likely to marry more educated men, whose incomes may allow the family to have a greater number of children. The following regression analysis will attempt to shed some light on these speculations.

Tables A8 to A13, in Appendix A, give the sample statistics by region of birth. When analyzing the sample of women aged 35-50 by place of birth, it is first apparent that, in every survey year, the native-born population is a slightly smaller fraction of the sample than among women aged 25-50. In the more mature sample, there are also consistently more immigrants from the United States, though they follow a similar decline as a percentage of the full sample (from 1.12% in 1986 to 0.47% in 2011). Women from the United States continue to

demonstrate higher mean numbers of children than native-born women or women from Northern or Western Europe, Australia and New Zealand.

Accounting for the fact that mean numbers of children are elevated across all regions of birth, and for small differences in the composition of the population, the results for the sample aged 35-50 are similar to those for women aged 25-50. The highest mean numbers of children among immigrants in 1986 were for women born in the Middle East or South and Southeast Asia, and East Asia. Immigrants from these regions amounted to 0.46%, 2.19%, and 1.40% of the sample, respectively. By 2011 those with the highest mean numbers of children shifted to Africa, the Middle East, and South and Southeast Asia, comprising 1.91% 1.64%, and 7.07% of the sample.

Between 1986 and 2011 immigrants from East Asia saw a sharp decline in mean numbers of children comparable to that in the sample aged 25-50, falling below the sample average and below the average for native-born women. Immigrants from Southern or Eastern Europe also saw a decline of similar magnitude in their mean numbers of children, and along with East Asians they are the only groups with mean numbers below those of native-born Canadians. While Southern or Eastern Europeans fell as a percentage of the full sample, East Asians rose as a percentage of the sample by a factor of three.

The summary statistics for Quebec and the ROC are shown in **Table A14** of Appendix A. Until 1996, the gap in mean numbers of children between Quebec

and the ROC is smaller among women aged 35-50 than among women aged 25-50. However, from 1996-2011 the gap is wider for women aged 35-50, which may indicate that women in the ROC are continuing to have children at later ages when most Quebec women have stopped, raising mean numbers of children in the ROC relative to those in Quebec for this age sample.

Regression Analysis

The following model (1) is estimated using OLS, after the sample proved too large for use with multinomial logit and ordered nonlinear regression analyses. This model incorporates traditional determinants of fertility – age, martial status, family income, female opportunity cost of time, and female education – as well as individuals' province/region of residence, immigrants' region of origin, and individuals' are of residence (whether rural or urban). Census family income and the opportunity cost of time are divided by a factor of 1000 in order to clarify the regression tables.

(1) $chd = \beta_1 age + \beta_2 single + \beta_3 wsd + \beta_4 com + \beta_5 y\_cf + \beta_6 opcost + \beta_7 qc + \beta_8 atl + \beta_9 pra + \beta_{10} ab + \beta_{11} bc + \beta_{12} + \beta_{13} atl + \beta_{14} qc + \beta_{15} pra + \beta_{16} ab + \beta_{17} bc + \beta_{18} hsch + \beta_{19} coll + \beta_{20} uni + \beta_{21} adv + \beta_{22} usa + \beta_{23} west + \beta_{24} eur + \beta_{25} midea + \beta_{26} sasia + \beta_{27} easia + \beta_{28} afri + \beta_{29} samer + \beta_{30} murb + \beta_{31} lurb + \beta_{32} ukwn + \mu$

Table 8: Model (1) Variables and Descriptions

Variable	Description
chd	The dependent variable of interest: the number of children per census family, which takes on values from 0 to 5 or more children.
age	In years, continuous.
mar	The default marital status, married.
single	Dummy variable for single women.
wsd	Dummy variable for women who are widowed, separated, or divorced.
com	Dummy variable for women in a common law union (not available for the year 1986).
y_cf	Census family income, continuous, scaled down by a factor of 1000.
opcost	Average weekly wage, constructed from individual women's wages and the number of weeks they worked in the past year.
on	The default province of residence, Ontario.
qc	Dummy variable for Quebec residents.
atl	Dummy variable for residents of the Atlantic provinces.
pra	Dummy variable for residents of Saskatchewan and Manitoba.
ab	Dummy variable for residents of Alberta.
bc	Dummy variable for residents of British Columbia.
less_hsch	The default level of education, less than a high school diploma.
hsch	Dummy variable for those whose highest degree is a high school diploma.
coll	Dummy variable for those whose highest degree is a college diploma or certificate, a trades certificate, some CEGEP, or another diploma or certificate below the Bachelor's level.
uni	Dummy variable for those whose highest degree is a Bachelor's degree.
can	The default country of birth, Canada.
adv	Dummy variable for those with degrees above the Bachelor's level.
usa	Dummy variable for immigrants born in the USA.
west	Dummy variable for immigrants born in Northern or Western Europe, Australia or New Zealand.
eur	Dummy variable for immigrants born in Southern or Eastern Europe.
midea	Dummy variable for immigrants born in the Middle East.
sasia	Dummy variable for immigrants born in South or Southeast Asia.
easia	Dummy variable for immigrants born in East Asia.
afri	Dummy variable for immigrants born in Africa.
samer	Dummy variable for immigrants born in Latin America.
surb	The default area of residence, small urban or rural areas.
murb	Dummy variable for residents of medium-sized urban areas.
lurb	Dummy variable for residents of large urban areas, which include Toronto, Montreal, and Vancouver.
ukwn	Dummy variable for those whose area of residence remains unknown (appears in 1986 – 1996).

Variable names and descriptions are given in **Table 8**. The northern provinces and territories are purposefully excluded from this analysis. The Atlantic provinces (Prince Edward Island, Nova Scotia, Newfoundland and Labrador, and New Brunswick) are grouped together. Ontario, Alberta, and British Columbia are held separate, while Saskatchewan and Manitoba are grouped as the Prairies.

Observations are further broken down by geographic location according to rural/small town areas, medium-sized urban areas, and large urban areas. By a process of elimination, all CMAs excepting Montreal, Toronto, Vancouver, and the medium-sized urban areas are classified as rural or small town areas. The medium-sized urban areas consist of cities of a wide range of sizes, and are listed as follows:

- St. John's
- GrandFalls-Windsor'
- Halifax
- Moncton
- Saint John
- Saguenay
- Quebec
- Trois-Rivieres
- Ottawa – Gatineau
- Kingston
- Oshawa
- Hamilton
- St. Catherines – Niagra
- London
- Windsor
- Barrie
- Greater Sudbury/Grand Sudbury

- Thunder Bay
- Winnipeg
- Regina
- Saskatoon
- Calgary
- Edmonton
- Kelowna
- Abbortsford – Mission
- Victoria

The opportunity cost of time of a woman's time in the labour market is given as an average weekly wage rather than an hourly wage. This is partly due to the manner in which censuses report the number of weeks worked and the number of hours worked. The number of weeks worked is given as the total number of weeks a respondent worked in the year previous to the current census. On the other hand, hours worked are given as the number of hours worked in the week previous to the census. Since these variables relate to different time frames, this analysis uses average weekly wages.

Although the following regressions use a weekly wage as an opportunity cost of time, there is possible endogeneity between fertility and female wages – as mentioned with regard to McNown (2003) in the literature review. Therefore, in a later section a predicted weekly wage is used in lieu of the calculated weekly wage mentioned here. The results are then compared.

As mentioned above, this analysis resorts to OLS regressions because of the large sample sizes available in the census master files, despite the fact that a nonlinear multinomial logit analysis, such as that of Van Soest (1995), or a linear

ordered probit/logit regression analysis may have been preferable. Even in the case of drastically reduced sample sizes, nonlinear multinomial logit regressions and linear ordered probit/logit regressions failed to converge. This is an area in which there could be further study.

The OLS regressions are weighted according to the appropriate personal weights. From 1986 to 1991, the weight variable is compw5, while from 1996-2011 the weight variable is compw2. In 2011, when the survey in question is the NHS rather than a census, the weights vary across records. However, in census years the weights are the same within individual censuses.

Regression Results for the Sample Aged 25-50

The regressions performed on the sample aged 25-50 for individual census files over the period from 1986 to 2011 explain from 6% to 11% of the variation in the number of children per census family. The numbers of observations per regression vary from 646 thousand to 1.046 million, and results are presented and discussed by survey year. As shown in **Table 9**, in 1986 all regressors are significant at the 5% level save for originating from Northern or Western Europe, Australia or New Zealand. The latter could relate to how immigrants from these countries have very similar numbers of children to native-born Canadians (who are the default category). The primary variables of interest in this analysis are

levels of education, family income, and female weekly wage. These will be assessed first, followed by the effects of age, marital status, province of residence, area of residence, and immigrants' place of birth.

As expected for the sample aged 25 to 50, higher levels of education among women have successively larger negative impacts on the number of children per census family. In 1986 family income has a positive but negligible effect on the number of children, while the opportunity cost of a woman's time has a slightly larger negative impact on the number of children; these effects are consistent from 1986 to 2011 for this age sample.

Another consistent effect over the interval from 1986 to 2011 is that, for the sample aged 25 to 50, female age has a small positive effect on the number of children per census family. Then, both being single and being widowed, separated, or divorced have relatively large, positive impacts on the number of children. Although it seems intuitive that widowed, separated, or divorced individuals might be more likely to have children (since they are also more likely to be older), the positive coefficient on single stands out.

Table 9: OLS Regression on the Number of Children per Census Family, Sample Aged 25-50, 1986

Obs.	646625		
R-squared	0.063		
Root MSE	1.064		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.017	0.000	0.000
Single, never married	0.324	0.006	0.000
Widowed, separated, or divorced	0.252	0.005	0.000
Census family income	0.0032	0.000	0.000
Opportunity cost of woman's time	-0.030	0.001	0.000
Quebec	-0.062	0.004	0.000
Atlantic Canada	0.126	0.005	0.000
Manitoba and Saskatchewan	0.092	0.005	0.000
Alberta	-0.022	0.005	0.000
British Columbia	-0.090	0.005	0.000
High school diploma	-0.082	0.004	0.000
Colleges, trades, or some CEGEP	-0.117	0.003	0.000
Bachelor level degree	-0.308	0.005	0.000
Advanced degree	-0.381	0.008	0.000
Born in the USA	0.118	0.014	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.004	0.007	0.627
Born in Southern or Eastern Europe	0.337	0.007	0.000
Born in the Middle East	0.495	0.022	0.000
Born in South or Southeast Asia	0.565	0.009	0.000
Born in East Asia	0.427	0.012	0.000
Born in Africa	0.359	0.019	0.000
Born in Latin America	0.447	0.010	0.000
Medium-sized urban area	0.093	0.004	0.000
Small urban or rural area	0.194	0.004	0.000
Unknown rural or urban area	0.371	0.004	0.000
Constant	0.694	0.008	0.000

The positive effect of being single may be due to the construction of this census. In the 1986 microdata there is no means of accounting for common law unions, so women who appear to be single with children may actually be in common law relationships. As the following years will show, introducing a dummy variable for common law status coincides with a change in sign on the coefficient for single women. Therefore, the effect of being single in 1986 is probably a side effect of there being no classification for common law unions

Residing in Quebec has a slight negative effect on the number of children as compared to residing in Ontario (the default category), but living in British Columbia has a stronger negative effect than living in Quebec, so this initial analysis does not make Quebec residents seem remarkable for very low fertility rates. Residing in Atlantic Canada, Manitoba, or Saskatchewan, all have positive effects. The greatest positive effects on the number of children are attributed to immigrants' place of birth; aside from the United States and Northern or Western Europe, Australia and New Zealand, a women's being born in a region outside Canada seems to increase the number of children in a census family. Finally, residing in medium-sized urban areas, or small urban or rural areas, has successively larger effects on the number of children per census family relative to the default category or residence in a large urban area. This is consistent with the theory that those living in less densely populated areas tend to have more children.

Table 10: OLS Regression on the Number of Children per Census Family, Sample Aged 25-50, 1991

Obs.	799410		
R-squared	0.095		
Root MSE	1.030		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.005	0.000	0.000
Single, never married	0.072	0.004	0.000
Common law	-0.908	0.005	0.000
Widowed, separated, or divorced	0.247	0.004	0.000
Census family income	0.0022	0.000	0.000
Opportunity cost of woman's time	-0.016	0.001	0.000
Quebec	0.022	0.003	0.000
Atlantic Canada	0.042	0.005	0.000
Manitoba and Saskatchewan	0.124	0.005	0.000
Alberta	0.040	0.004	0.000
British Columbia	-0.044	0.004	0.000
High school diploma	-0.017	0.003	0.000
Colleges, trades, or some CEGEP	-0.094	0.003	0.000
Bachelor level degree	-0.216	0.004	0.000
Advanced degree	-0.259	0.006	0.000
Born in the USA	0.114	0.012	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.005	0.007	0.532
Born in Southern or Eastern Europe	0.281	0.007	0.000
Born in the Middle East	0.585	0.018	0.000
Born in South or Southeast Asia	0.512	0.007	0.000
Born in East Asia	0.280	0.009	0.000
Born in Africa	0.321	0.015	0.000
Born in Latin America	0.440	0.008	0.000
Medium-sized urban area	0.050	0.004	0.000
Small urban or rural area	0.154	0.003	0.000
Unknown rural or urban area	0.302	0.004	0.000
Constant	1.171	0.007	0.000

The results for 1991 are shown in **Table 10**. Again, all regressors except originating from Northern or Western Europe, Australia or New Zealand, are individually significant at the 5% level. Higher levels of education continue to yield larger and larger negative effects on the number of children per woman in a census family. And as in 1986, census family income has a slight positive effect on the number of children present, which is outweighed by the negative effect of the female weekly wage, a woman's opportunity cost of time in the labour market.

In 1991 the data recorded common law unions, and being in a common law union enters as having a strong negative effect on the number of children per census family, and simultaneously being single has a much smaller effect on the number of children (as compared to 1986). Another change relative to 1986 is that the various provinces enter with coefficients of varying signs and magnitudes.

Residing in Quebec now has a small positive effect on the number of children per census family, as does living in Alberta. Immigrants' place of birth have broadly similar effects to the previous year, as does area of residence. The coincidence of the introduction of a common law dummy variable and the change in sign for Quebec residents is worth consideration. Residents of Quebec are more likely to live in common law unions (Le Bourdais et al., 2004) and so contributions to lower numbers of children per census family, which were

ascribed to Quebec residency in 1986, might now be discerned as a an effect of common law unions instead.

In 1996 the effects of women's education on the number of children per census family remain similar. However, having a high school diploma is no longer significant at the 5% or even the 10% level (see **Table 11**).

The positive effect of census family income is outweighed by the negative effect of the female weekly wage, just as before, reinforcing the impression that the positive family income effect is dominated by the negative substitution effect of the female opportunity cost of time. Since the remaining survey years for the sample aged 25 to 50 are consistent in this way, the fact will go unremarked in the remainder of this analysis.

The effect of living in Atlantic Canada becomes negative, and those in unknown rural or urban areas have a less marked positive effect on the number of children. Meanwhile, immigrants' being born in Northern or Western Europe, Australia or New Zealand is now significant at the 5% level. Being born in those countries has a small negative effect on the number of children as compared to native-born Canadians. The positive effect of being born in East Asia has also diminished significantly from 1986 levels.

Table 11: OLS Regression on the Number of Children per Census Family, Sample Aged 25-50, 1996

Obs.	839055		
R-squared	0.086		
Root MSE	1.031		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.002	0.000	0.000
Single, never married	0.044	0.004	0.000
Common law	-0.824	0.004	0.000
Widowed, separated, or divorced	0.200	0.004	0.000
Census family income	0.00203	0.000	0.000
Opportunity cost of woman's time	-0.021	0.001	0.000
Quebec	0.045	0.003	0.000
Atlantic Canada	-0.036	0.005	0.000
Manitoba and Saskatchewan	0.106	0.005	0.000
Alberta	0.010	0.004	0.011
British Columbia	-0.072	0.004	0.000
High school diploma	-0.003	0.003	0.332
Colleges, trades, or some CEGEP	-0.067	0.003	0.000
Bachelor level degree	-0.189	0.004	0.000
Advanced degree	-0.224	0.006	0.000
Born in the USA	0.086	0.013	0.000
Born in Northern or Western Europe, Australia, or New Zealand	-0.020	0.008	0.014
Born in Southern or Eastern Europe	0.151	0.007	0.000
Born in the Middle East	0.517	0.016	0.000
Born in South or Southeast Asia	0.381	0.006	0.000
Born in East Asia	0.194	0.008	0.000
Born in Africa	0.363	0.013	0.000
Born in Latin America	0.357	0.008	0.000
Medium-sized urban area	0.047	0.003	0.000
Small urban or rural area	0.134	0.004	0.000
Unknown rural or urban area	0.250	0.004	0.000
Constant	1.340	0.008	0.000

Table 12: OLS Regression on the Number of Children per Census Family, Sample Aged 25-50, 2001

Obs.	869405		
R-squared	0.114		
Root MSE	1.047		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.010	0.000	0.000
Single, never married	-0.700	0.004	0.000
Common law	-0.147	0.004	0.000
Widowed, separated, or divorced	-0.124	0.004	0.000
Census family income	0.00048	0.000	0.000
Opportunity cost of woman's time	-0.011	0.001	0.000
Quebec	0.096	0.003	0.000
Atlantic Canada	-0.102	0.005	0.000
Manitoba and Saskatchewan	0.080	0.005	0.000
Alberta	-0.021	0.004	0.000
British Columbia	-0.066	0.004	0.000
High school diploma	-0.024	0.004	0.000
Colleges, trades, or some CEGEP	-0.063	0.003	0.000
Bachelor level degree	-0.222	0.004	0.000
Advanced degree	-0.257	0.005	0.000
Born in the USA	0.125	0.014	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.031	0.009	0.001
Born in Southern or Eastern Europe	0.014	0.007	0.054
Born in the Middle East	0.299	0.013	0.000
Born in South or Southeast Asia	0.260	0.006	0.000
Born in East Asia	-0.093	0.007	0.000
Born in Africa	0.420	0.012	0.000
Born in Latin America	0.358	0.008	0.000
Medium-sized urban area	0.068	0.003	0.000
Small urban or rural area	0.170	0.003	0.000
Constant	1.156	0.008	0.000

In 2001 the effects of levels of education appear consistent (see **Table 12**) with previous years, but **Figure 14** at the end of this section reveals slight fluctuations in the coefficients, and a tendency toward convergence over time. Whereas census family income had shown a small but positive effect up to this point, in 2001 is seems to have practically no effect on the number of children per census family.

There is further variation in the effects of province of residence, the coefficient on Alberta becoming negative relative to the default province of Ontario, while the coefficient on residence in British Columbia is the only one with a similar magnitude to 1996. As the rest of this analysis will show, the effects of province of residence are quite inconsistent.

The effects of being single and of being widowed, separated, or divorced change sign, becoming negative. For the first time, in 2001 being single also has a larger negative effect than being in a common law union. There are no longer any observations for which CMA remains unknown, and this could be a part of the increase in the coefficients for resident of medium-sized urban areas, and small urban or rural areas.

Table 13: OLS Regression on the Number of Children per Census Family, Sample Aged 25-50, 2006

Obs.	898425		
R-squared	0.083		
Root MSE	1.022		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.007	0.000	0.000
Single, never married	0.097	0.003	0.000
Common law	-0.736	0.004	0.000
Widowed, separated, or divorced	0.181	0.004	0.000
Census family income	0.00079	0.000	0.000
Opportunity cost of woman's time	-0.007	0.000	0.000
Quebec	0.055	0.003	0.000
Atlantic Canada	-0.151	0.005	0.000
Manitoba and Saskatchewan	0.033	0.005	0.000
Alberta	-0.071	0.004	0.000
British Columbia	-0.095	0.004	0.000
High school diploma	-0.063	0.004	0.000
Colleges, trades, or some CEGEP	-0.080	0.004	0.000
Bachelor level degree	-0.191	0.004	0.000
Advanced degree	-0.244	0.005	0.000
Born in the USA	0.030	0.015	0.047
Born in Northern or Western Europe, Australia, or New Zealand	0.045	0.010	0.000
Born in Southern or Eastern Europe	-0.058	0.007	0.000
Born in the Middle East	0.389	0.011	0.000
Born in South or Southeast Asia	0.281	0.005	0.000
Born in East Asia	-0.096	0.006	0.000
Born in Africa	0.434	0.010	0.000
Born in Latin America	0.219	0.007	0.000
Medium-sized urban area	0.014	0.003	0.000
Small urban or rural area	0.108	0.003	0.000
Constant	1.295	0.008	0.000

Excepting being born in Southern or Eastern Europe, all regressors are individually significant at the 5% level. In terms of immigrants' region of birth, the positive effect of being born in Southern or Eastern Europe falls below that of being born in Northern or Western Europe, Australia or New Zealand; additionally, the coefficient on being born in East Asia turns negative.

In 2006 (**Table 13**) the effects of education, family income, and female weekly wage among women aged 25 to 50 are consistent with previous years. All variables are individually significant at the 5% level. Being single or widowed, separated, or divorced once again have positive effects on the number of children per census family, and provincial effects continue to vary. Across the provinces only residents of Quebec, Manitoba, and Saskatchewan display positive coefficients. By 2006 significant positive effects of immigrants' being born in another region are restricted to South or Southeast Asia, the Middle East, Africa, and Latin America.

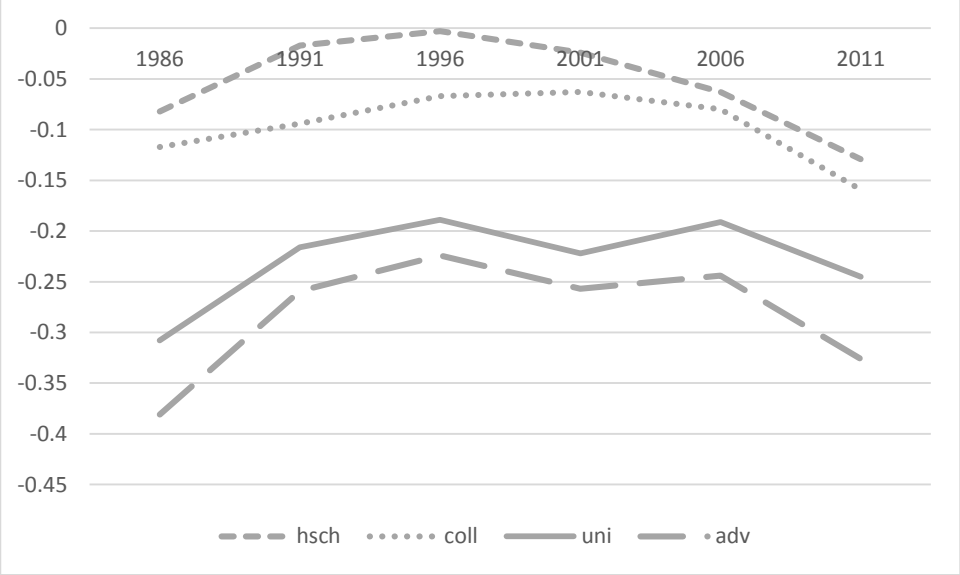
In 2011 the results are quite similar to 2006, as can be seen in **Table 14**. However, immigrants' being born in Southern and Eastern Europe, as well as East Asia, now have negative effects on the number of children per census family, in line with the earlier descriptive analysis.

Table 14: OLS Regression on the Number of Children per Census Family, Sample Aged 25-50, 2011

Obs.	1046265		
R-squared	0.081		
Root MSE	1.041		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.006	0.000	0.000
Single, never married	0.103	0.003	0.000
Common law	-0.674	0.003	0.000
Widowed, separated, or divorced	0.181	0.003	0.000
Census family income	0.00088	0.000	0.000
Opportunity cost of woman's time	-0.026	0.001	0.000
Quebec	0.077	0.003	0.000
Atlantic Canada	-0.169	0.004	0.000
Manitoba and Saskatchewan	0.069	0.005	0.000
Alberta	-0.069	0.004	0.000
British Columbia	-0.104	0.003	0.000
High school diploma	-0.129	0.004	0.000
Colleges, trades, or some CEGEP	-0.159	0.004	0.000
Bachelor level degree	-0.245	0.004	0.000
Advanced degree	-0.326	0.005	0.000
Born in the USA	0.106	0.015	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.043	0.010	0.000
Born in Southern or Eastern Europe	-0.062	0.007	0.000
Born in the Middle East	0.458	0.008	0.000
Born in South or Southeast Asia	0.294	0.004	0.000
Born in East Asia	-0.089	0.006	0.000
Born in Africa	0.506	0.008	0.000
Born in Latin America	0.177	0.007	0.000
Medium-sized urban area	0.012	0.003	0.000
Small urban or rural area	0.101	0.003	0.000
Constant	1.415	0.007	0.000

In review, the effects of women's highest level of education converged to some extent over the period of 1986 to 2011 for this sample aged 25 to 50, and the coefficients are graphed **in Figure 14** below. Compared to the default case of no high school diploma, lower levels of education (high school and college) had a comparatively larger negative effect on the number of children by 2011, while higher levels of education (Bachelor's and advanced degrees) had a smaller negative effect on the number of children by 2011.

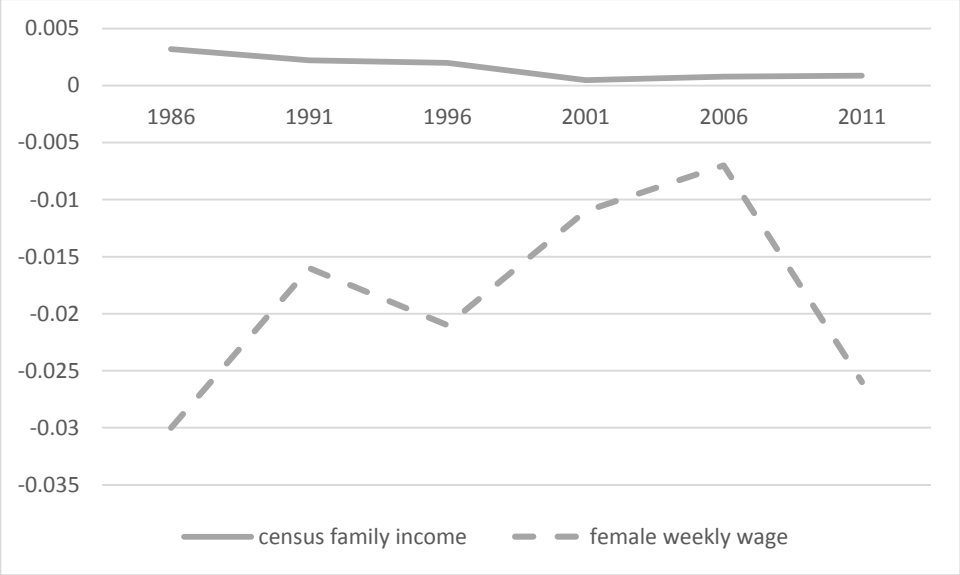
Figure 14: The Effects of Education Levels on the Number of Children per Census Family, 1986-2011. Sample Aged 25 to 50



Whereas family income had a fairly constant effect on the number of children per census family from 1986 to 2011, being positive but near zero, as shown in **Figure 15,** the effect of the female weekly wage fluctuated comparatively widely. In fact, this negative effect of a woman's opportunity cost

of time appeared to be trending toward zero when it dropped sharply between 2006 and 2011, nearly reaching 1986 levels.

Figure 15: The Effects of Family Income and Female Weekly Wage on the Number of Children per Census Family, 1986-2011. Sample Aged 25-50



For the sample aged 25 to 50, women's age had a slight positive effect on the number of children throughout the sample period, which is consistent with the notion that an additional year of age provides the opportunity to have more children. Age effects are further discussed following the regression analysis of the older age sample. The effects of marital status became consistent once a dummy variable for common law status was introduced in 1991, with common law unions having a distinct negative effect on the number of children. Finally, the effects of immigrants' place of birth shifted as expected from the Descriptive

Analysis; however, the effects of a woman's province of residence varied in ways that cannot be readily explained within the scope of this paper.

Regression Results for the Sample Aged 35-50

The following OLS regressions on the sample aged 35 to 50 explain from 5% to 11% of the variation in the number of children per census family. The sample sizes are smaller (though still quite large), at from 346 thousand to 693 thousand due to the reduced age interval of the sample. As before, virtually all the coefficients are individually statistically significant, and the results are presented by survey year.

In 1986 (refer to **Table 15** below) a woman's level of education has a progressively larger negative effect on the number of children per census family, similar to the sample aged 25 to 50 – but this is the only year for which this relationship holds in the sample aged 35 to 50. On the other hand, the very slight positive effect of family income, and the larger negative effect of the female weekly wage, are similar to the sample aged 25 to 50 and persist throughout the sample years.

Table 15: OLS Regression on the Number of Children per Census family, Sample Aged 35-50, 1986

Obs.	345790		
R-squared	0.057		
Root MSE	1.063		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.042	0.000	0.000
Single, never married	-0.325	0.012	0.000
Widowed, separated, or divorced	0.134	0.006	0.000
Census family income	0.0033	0.000	0.000
Opportunity cost of woman's time	-0.025	0.002	0.000
Quebec	-0.009	0.005	0.079
Atlantic Canada	0.182	0.007	0.000
Manitoba and Saskatchewan	0.081	0.007	0.000
Alberta	-0.035	0.007	0.000
British Columbia	-0.125	0.006	0.000
High school diploma	-0.043	0.005	0.000
Colleges, trades, or some CEGEP	-0.012	0.005	0.007
Bachelor level degree	-0.128	0.007	0.000
Advanced degree	-0.271	0.010	0.000
Born in the USA	0.056	0.017	0.001
Born in Northern or Western Europe, Australia, or New Zealand	0.052	0.008	0.000
Born in Southern or Eastern Europe	0.353	0.008	0.000
Born in the Middle East	0.454	0.028	0.000
Born in South or Southeast Asia	0.538	0.012	0.000
Born in East Asia	0.533	0.015	0.000
Born in Africa	0.394	0.024	0.000
Born in Latin America	0.434	0.012	0.000
Medium-sized urban area	0.075	0.005	0.000
Small urban or rural area	0.106	0.006	0.000
Unknown rural or urban area	0.246	0.006	0.000
Constant	3.216	0.018	0.000

Age now has a small negative effect on the number of children, in direct contrast with the sample aged 25 to 50. Furthermore, although there is no dummy variable for common law status in 1986, unlike the previous results, the sample aged 35 to 50 does not show a positive coefficient on single marital status in 1986. There is still a relatively substantial positive effect of being widowed, separated, or divorced, however.

Quebec residency has only a very small negative effect on the number of children when compared to the sample aged 25 to 50, and it is the only regressor which is not significant at the 5% level. Area of residence has consistent effects throughout the two age samples, with a larger positive effect in areas with a lower population density. Lastly, the effects of immigrants' region of origin are thus far consistent with the descriptive analysis and the regression for those aged 25 to 50 in 1986.

In 1991 all regressors are individually significant at the 5% level, and the results are shown in **Table 16**. Unlike the results from 1986, the only higher level of education associated with a lower number of children per census family is that of advanced degrees. Women with college degrees have the largest positive effect on the number of children. Since coefficients on census family income and the female weekly wage yield similar results throughout the sample aged 35 to 50, they will be discussed at the end of this section.

Table 16: OLS Regression on the Number of Children per Census family, Sample Aged 35-50, 1991

Obs.	458200		
R-squared	0.117		
Root MSE	1.010		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.053	0.000	0.000
Single, never married	-0.314	0.007	0.000
Common law	-0.804	0.007	0.000
Widowed, separated, or divorced	0.075	0.005	0.000
Census family income	0.0022	0.000	0.000
Opportunity cost of woman's time	-0.013	0.001	0.000
Quebec	0.019	0.004	0.000
Atlantic Canada	0.075	0.006	0.000
Manitoba and Saskatchewan	0.084	0.006	0.000
Alberta	-0.018	0.006	0.002
British Columbia	-0.098	0.005	0.000
High school diploma	0.035	0.004	0.000
Colleges, trades, or some CEGEP	0.040	0.004	0.000
Bachelor level degree	0.031	0.006	0.000
Advanced degree	-0.085	0.007	0.000
Born in the USA	0.093	0.014	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.085	0.008	0.000
Born in Southern or Eastern Europe	0.327	0.008	0.000
Born in the Middle East	0.654	0.023	0.000
Born in South or Southeast Asia	0.533	0.009	0.000
Born in East Asia	0.376	0.011	0.000
Born in Africa	0.364	0.018	0.000
Born in Latin America	0.474	0.010	0.000
Medium-sized urban area	0.043	0.005	0.000
Small urban or rural area	0.096	0.004	0.000
Unknown rural or urban area	0.188	0.005	0.000
Constant	3.639	0.015	0.000

Another factor which is consistent throughout this age sample is that age continues to have a slight negative effect on the number of children per census family, although it had a positive effect in the wider age sample. Conversely, there is a negative effect on the number of children associated with common law status, just as in the wider age sample.

The negative effect of common law status is noticeably greater even than that of being single. Residency in Alberta and British still contribute negative effects on the number of children, whereas Manitoba, Saskatchewan, and Atlantic Canada contribute slight positive effects, and Quebec residency also has a slight positive effects (again, which may be due to the data on common law marriages). Note that, as for the sample aged 25 to 50 in the same year, residency in Alberta had a positive effect on the number of children per census family.

Area of residence and immigrants' place of birth are broadly consistent with the descriptive statistics. However, it is notable that the magnitude of the coefficients on immigrants' place of birth differ when compared to the sample aged 25 to 50, such that the immigrant groups which contribute the greatest positive effects, and the greatest negative effects, differ between age samples.

In 1996 having an advanced degree does not enter the regression significantly and has a lesser negative effect on the number of children per census family, as shown in **Table 17**. However, the coefficients on education, family income, and female weekly wage are largely consistent with past years.

Table 17: OLS Regression on the Number of Children per Census family, Sample Aged 35-50, 1996

Obs.	529105		
R-squared	0.113		
Root MSE	1.011		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.050	0.000	0.000
Single, never married	-0.272	0.006	0.000
Common law	-0.732	0.006	0.000
Widowed, separated, or divorced	0.050	0.004	0.000
Census family income	0.0018	0.000	0.000
Opportunity cost of woman's time	-0.018	0.001	0.000
Quebec	0.015	0.004	0.000
Atlantic Canada	-0.021	0.006	0.000
Manitoba and Saskatchewan	0.074	0.006	0.000
Alberta	-0.019	0.005	0.000
British Columbia	-0.086	0.005	0.000
High school diploma	0.061	0.004	0.000
Colleges, trades, or some CEGEP	0.042	0.004	0.000
Bachelor level degree	0.078	0.005	0.000
Advanced degree	-0.007	0.007	0.299
Born in the USA	0.075	0.014	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.064	0.009	0.000
Born in Southern or Eastern Europe	0.213	0.008	0.000
Born in the Middle East	0.564	0.020	0.000
Born in South or Southeast Asia	0.426	0.008	0.000
Born in East Asia	0.246	0.009	0.000
Born in Africa	0.403	0.015	0.000
Born in Latin America	0.434	0.009	0.000
Medium-sized urban area	0.032	0.004	0.000
Small urban or rural area	0.075	0.005	0.000
Unknown rural or urban area	0.160	0.004	0.000
Constant	3.581	0.014	0.000

Common law status still has a large negative effect on the number of children. Residents of Alberta and British Columbia still have fewer children per

census family relative to residents of Ontario, but now residents of Atlantic Canada display a negative coefficient as well. Quebec, Manitoba, and Saskatchewan residents have relatively more children.

Although there are no longer any observations for which area of residence remains unknown, the coefficients on residence in a medium-sized urban area, or a small urban or rural area, do not change significantly in sign or magnitude. Instead, over the period of 1986 to 2011 for this sample the aforementioned coefficients gradually decrease in magnitude, which would indicate that population density is having a declining effect on the number of children per census family.

In 2001 all regressors excepting an advanced degree are significant at the 5% level. A woman's having an advanced degree still has a slight negative effect on the number of children per census family, as shown in **Table 18** below, but all other levels of education above less than a high school diploma have a positive effect.

2001 is the only instance in which the sample aged 35 to 50 indicates that being single has a greater negative effect on the number of children per census family than being in a common law union. This is also the only instance in which being widowed, separated, or divorced has a negative effect on the number of children. It is difficult to speculate on the reasons for such changes. In addition to

the differences highlighted in the descriptive analysis, these are additional anomalies which set 2001 apart from the other survey years.

Table 18: OLS Regression on the Number of Children per Census Family, Sample Aged 35-50, 2001

Obs.	585095		
R-squared	0.108		
Root MSE	1.033		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.045	0.000	0.000
Single, never married	-0.618	0.005	0.000
Common law	-0.388	0.005	0.000
Widowed, separated, or divorced	-0.082	0.004	0.000
Census family income	0.0010	0.000	0.000
Opportunity cost of woman's time	-0.015	0.001	0.000
Quebec	0.042	0.004	0.000
Atlantic Canada	-0.124	0.006	0.000
Manitoba and Saskatchewan	0.039	0.006	0.000
Alberta	-0.045	0.005	0.000
British Columbia	-0.073	0.004	0.000
High school diploma	0.057	0.004	0.000
Colleges, trades, or some CEGEP	0.039	0.004	0.000
Bachelor level degree	0.062	0.005	0.000
Advanced degree	-0.011	0.006	0.086
Born in the USA	0.097	0.016	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.059	0.010	0.000
Born in Southern or Eastern Europe	0.032	0.008	0.000
Born in the Middle East	0.377	0.016	0.000
Born in South or Southeast Asia	0.307	0.007	0.000
Born in East Asia	-0.043	0.008	0.000
Born in Africa	0.462	0.014	0.000
Born in Latin America	0.394	0.009	0.000
Medium-sized urban area	0.034	0.004	0.000
Small urban or rural area	0.074	0.004	0.000
Constant	3.440	0.014	0.000

On the other hand the coefficients on province of residence and immigrants' region of origin are much as expected based on other years. The positive effects of living in a medium-sized urban area, or a small urban or rural area, continue to decline. Finally, in 2001 the coefficient on being born in East Asia has become negative relative to native-born Canadians.

The results for 2006, displayed in **Table 19**, indicate that the positive coefficients on high school, college, and a bachelor's degree have decreased in magnitude, while a woman with an advanced degree has a slightly greater negative effect on the number of children per census family. Having a high school diploma is significant at the 10% level, but not at the 5% level.

Coefficients on marital status yield the same signs as before 2001, with being widowed, separated, or divorced having a positive effect on the number of children once more. In 2006, residency in Manitoba or Saskatchewan does not enter significantly, and the coefficients on the area of residence dummy variables decline again, most notably for residence in small urban or rural areas. Given these results, it would be interesting to research the possibility that women in large cities are no longer having far fewer children than those in smaller cities and rural areas, despite a higher cost of living and (generally) a higher opportunity cost of women's time in dense urban areas.

Table 19: OLS Regression on the Number of Children per Census Family, Sample Aged 35-50, 2006

Obs.	609080		
R-squared	0.087		
Root MSE	1.011		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.036	0.000	0.000
Single, never married	-0.160	0.005	0.000
Common law	-0.574	0.005	0.000
Widowed, separated, or divorced	0.040	0.004	0.000
Census family income	0.00069	0.000	0.000
Opportunity cost of woman's time	-0.006	0.000	0.000
Quebec	0.039	0.004	0.000
Atlantic Canada	-0.173	0.005	0.000
Manitoba and Saskatchewan	-0.001	0.006	0.841
Alberta	-0.089	0.005	0.000
British Columbia	-0.109	0.004	0.000
High school diploma	0.009	0.005	0.072
Colleges, trades, or some CEGEP	0.017	0.005	0.000
Bachelor level degree	0.015	0.005	0.006
Advanced degree	-0.051	0.006	0.000
Born in the USA	0.032	0.017	0.055
Born in Northern or Western Europe, Australia, or New Zealand	0.064	0.011	0.000
Born in Southern or Eastern Europe	-0.081	0.008	0.000
Born in the Middle East	0.380	0.013	0.000
Born in South or Southeast Asia	0.297	0.006	0.000
Born in East Asia	-0.135	0.007	0.000
Born in Africa	0.491	0.012	0.000
Born in Latin America	0.255	0.008	0.000
Medium-sized urban area	0.020	0.004	0.000
Small urban or rural area	0.039	0.003	0.000
Constant	3.155	0.014	0.000

Finally, in terms of immigrants' place of birth, being born in the United States is significant at the 10% level but not at the 5% level. Being born in East

Asia has a stronger negative effect on the number of children per census family than in the previous year, while the effect of being born in Southern or Eastern Europe becomes negative in 2001.

The regression results for 2011 indicate that all regressors enter significantly, and are shown in **Table 20** below. The results are characteristic of this sample over the time period of interest, excepting the results for levels of education. These are similar to the sample aged 25 to 50, as all levels of education from a high school diploma to an advanced degree display negative coefficients. This is at odds with the descriptive statistics for 2011 (**Table 7**), which showed that those with the most children per census family were women with Bachelor's degrees, followed by women with advanced degrees, women with less than a high school diploma, women with a college diploma or equivalent, and lastly women with a high school diploma. The regression results could indicate that something other than the level of education is responsible for women with higher levels of education having higher mean numbers of children.

A woman's age has a slight negative effect on the number of children per census family, while being single or in a common law union have successively larger negative effects. Being widowed, separated, or divorced has a small positive effect on the number of children present. Census family income has a very small positive effect, and the opportunity cost of a woman's time has a larger negative effect.

Table 20: OLS Regression on the Number of Children per Census Family, Sample Aged 35-50, 2011

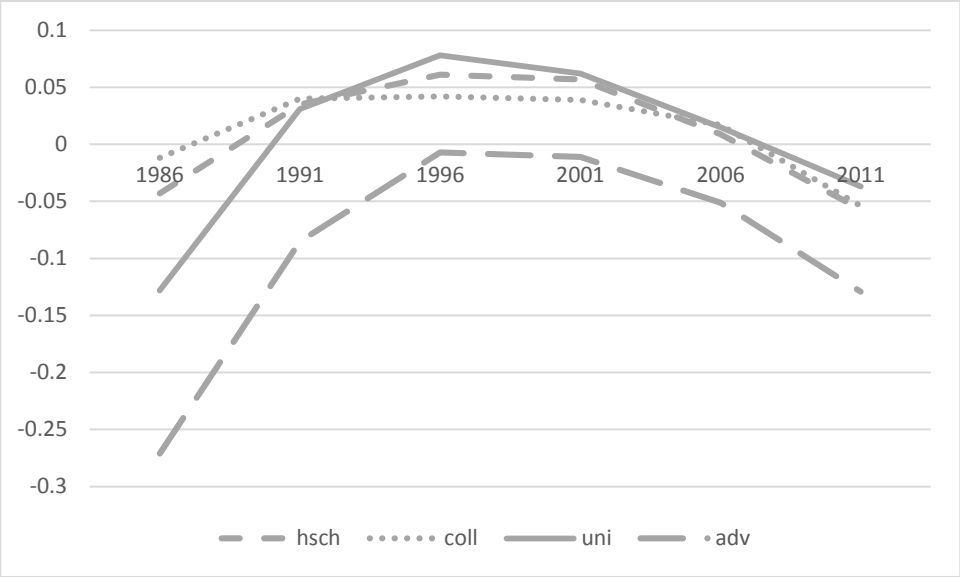
Obs.	693315		
R-squared	0.085		
Root MSE	1.017		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.036	0.000	0.000
Single, never married	-0.113	0.004	0.000
Common law	-0.495	0.004	0.000
Widowed, separated, or divorced	0.059	0.004	0.000
Census family income	0.00079	0.000	0.000
Opportunity cost of woman's time	-0.021	0.001	0.000
Quebec	0.050	0.003	0.000
Atlantic Canada	-0.194	0.005	0.000
Manitoba and Saskatchewan	0.037	0.006	0.000
Alberta	-0.087	0.005	0.000
British Columbia	-0.103	0.004	0.000
High school diploma	-0.057	0.005	0.000
Colleges, trades, or some CEGEP	-0.054	0.004	0.000
Bachelor level degree	-0.037	0.005	0.000
Advanced degree	-0.129	0.006	0.000
Born in the USA	0.109	0.018	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.063	0.010	0.000
Born in Southern or Eastern Europe	-0.120	0.008	0.000
Born in the Middle East	0.449	0.010	0.000
Born in South or Southeast Asia	0.283	0.005	0.000
Born in East Asia	-0.143	0.006	0.000
Born in Africa	0.557	0.009	0.000
Born in Latin America	0.191	0.007	0.000
Medium-sized urban area	0.012	0.004	0.002
Small urban or rural area	0.019	0.003	0.000
Constant	3.235	0.013	0.000

Compared to residency in Ontario, living in Quebec, Manitoba, or Saskatchewan contributes to higher numbers of children per census family.

Living in Atlantic Canada, Alberta, or British Columbia contributes to lower numbers of children. Then, as expected, immigrants' originating in Southern or Eastern Europe, or East Asia, has a negative effect on the expected number of children.

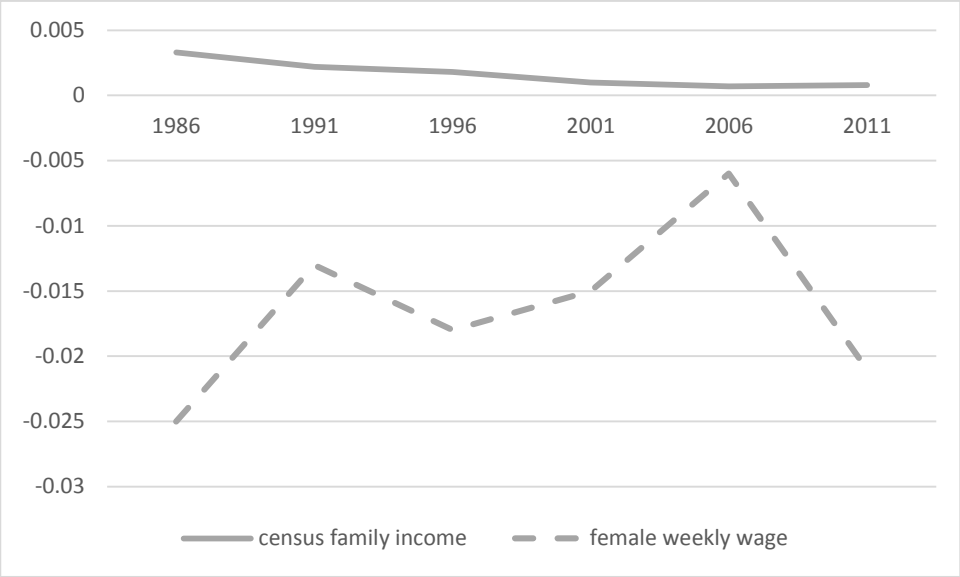
The sample aged 35 to 50 showed largely positive effects of women's education on fertility, with 2011 being the exception. The coefficients for each level of education are graphed over time in **Figure 16**. Higher levels of education have the largest positive effects on the number of children around 1996 and 2001, and like the sample aged 25 to 50, this sample aged 35 to 50 shows the effects of various levels of education converging toward the end of the 25 year period. The coefficients converge to a greater degree in this older age sample, and there is a very clear pattern of education having a rapidly rising and then declining effect on the number of children per census family. Since women between 35 and 50 were selected in an effort to discern trends among completed family size, this may in fact be the effect of education on desired family sizes (given the precision of birth control).

Figure 16: The Effects of Education Levels on the Number of Children per Census Family, from 1986-2011. Sample Aged 35 to 50



Similar to the sample aged 25 to 50, the slight positive effect of census family income on the number of children per census family declined over the years 1986 to 2011. The negative effect of the female weekly wage also decreased in magnitude until 2011, when it reached nearly as great a negative effect as in 1986. Considering the trend in the education coefficients, it is possible that a declining negative substitution effect on the opportunity cost of women's time may have resulted in more educated women having more children. However, despite the fall in education coefficients in 2011, and the increased negative effect of the female weekly wage in the same year, it is difficult to explain why the descriptive analysis still indicates that women with more education tend to have more children in their census families.

Figure 17: The Effects of Family Income and Female Weekly Wage on the Number of Children per Census Family, from 1986-2011. Sample Aged 35-50



Unlike the sample aged 25 to 50, this sample indicates that age consistently has a negative effect on the number of children. It is possible that the negative effect of age may be a cohort effect, and that older women in a given survey year may have chosen relatively smaller families than their younger counterparts. Yet this could also be capturing the effect of children leaving the household to establish themselves, which is more likely among a sample of older women.

In terms of geographic factors for the sample aged 35 to 50 over the years 1986 to 2011, the effects of immigrants' region of origin and individual's province of residence were not overly remarkable, with the exception of Quebec. Similar to the sample aged 25 to 50, OLS regression analysis on the sample aged 35 to 50 does not indicate that Quebec is a province with especially low fertility rates; however, it does indicate that common law unions have a strong negative effect

on the number of children per census family. This raises the possibility that there is something about the preference for common law unions specifically which explains the gap between the number of children per family in Quebec versus the ROC.

Finally, it is important to note that various regressors were insignificant in individual survey years, but none emerged as consistently insignificant. Province of residence is often inconsistent in this way.

Estimated Female Wages

The previous regression analysis relied upon an opportunity cost of time constructed from women's yearly wages and the number of weeks they worked in the year prior to the relevant survey year. However, as noted in the literature review, female labour supply (and thus wages/income) and fertility decisions are often treated as endogenous, and an additional problem with using the weekly wage is that this does not give a measure of opportunity cost among women for whom a weekly wage is not reported, perhaps because the woman didn't work in the labour market in the previous year.

Given these concerns, a proxy for the female weekly wage is estimated for all observations. The predicted weekly wage (p_wage) is then used in the main

regression in place of the original opportunity cost of time (opcost), and the results for each survey year are analyzed as follows.

The predicted weekly wage is based on female age, education, immigrant status, years since immigration, province of residence, and industry and occupation categories. Age and age squared serve as proxies for work experience and experience squared, which were not available in the survey data. Due to differences in the coding of occupation and industry variables between survey years, each wage regression varies slightly in terms of these industry/occupation dummy variables. An effort was made to remain consistent in using manufacturing or trades as the default categories. The wage estimation regressions are shown in **Appendix B** for both age samples, and explain from 7% to 13% of the variation in the female weekly wage.

Using the predicted wages from these wage estimation regressions, model (1) is re-estimated using OLS and the appropriate weight variables for each survey year – see equation (2) below. Census family income and the predicted weekly wage are again divided by a factor of 1000 in order to clearly present their effects.

(2) $chd = \beta_1 age + \beta_2 single + \beta_3 wsd + \beta_4 com + \beta_5 y\_cf + \beta_6 p\_wage + \beta_7 qc + \beta_8 atl + \beta_9 pra + \beta_{10} ab + \beta_{11} bc + \beta_{12} + \beta_{13} atl + \beta_{14} qc + \beta_{15} pra + \beta_{16} ab + \beta_{17} bc + \beta_{18} hsch + \beta_{19} coll + \beta_{20} uni + \beta_{21} adv + \beta_{22} usa + \beta_{23} west + \beta_{24} eur + \beta_{25} midea + \beta_{26} sasia + \beta_{27} easia + \beta_{28} afri + \beta_{29} samer + \beta_{30} murb + \beta_{31} lurb + \beta_{32} ukwn + \mu$

Regression Results for the Sample Aged 25 to 50

Tables 21 to 26 show the regression results for the sample aged 25 to 50 using the predicted female weekly wage as the opportunity cost of time in the labour market. Overall the predicted weekly wage seems to explain more of the variation in the number of children due to the female wage. Throughout 1986 to 2011, the coefficients on the predicted wage are significantly greater in magnitude than those on the weekly wage calculated previously, although this results is slightly less marked in later years. This would indicate that the estimated wage is capturing more of the variation in the number of children per census family which is due to females' opportunity cost of time. Meanwhile, the coefficients on census family income are nearly the same whether the original weekly wage or this predicted wage are employed. The coefficients for the predicted wage and census family income are graphed and discussed at the end of this section.

In 1986 and 1991 the coefficients on all levels of education differ from the regressions using the original weekly wage. The negative effects of education are smaller, and then from 1996 to 2006 the effects of education maintain a negative sign and very similar magnitudes to the earlier regressions. Finally, in 2011 a Bachelor's degree or an advanced degree has a much smaller negative effect when the predicted wage is used as an opportunity cost of time. The effects of

education on the number of children per census family are also graphed at the end of this section, and show a greater similarity to the movements in the predicted wage coefficients. It is interesting that the direct effects of education on the number of children are more in line with the indirect effects of education, through female wages, when the proxy for wages is employed.

There are very few secondary differences evidenced by the fertility equations when the predicted wage is employed. Age and single marital status have smaller coefficients in 1986 and 1991, while the effect of residence in Quebec on the number of children changes in 1991 from a positive effect to a relatively small negative effect.

Table 21: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 25-50, 1986

Obs.	875335		
R-squared	0.076		
Root MSE	1.103		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.008	0.000	0.000
Single, never married	0.192	0.005	0.000
Widowed, separated, or divorced	0.241	0.004	0.000
Census family income	0.0038	0.000	0.000
Estimated wage	-0.340	0.002	0.000
Quebec	-0.068	0.003	0.000
Atlantic Canada	0.118	0.005	0.000
Manitoba and Saskatchewan	0.126	0.005	0.000
Alberta	0.006	0.004	0.195
British Columbia	-0.079	0.004	0.000
High school diploma	-0.049	0.003	0.000
Colleges, trades, or some CEGEP	-0.077	0.003	0.000
Bachelor level degree	-0.229	0.005	0.000
Advanced degree	-0.295	0.007	0.000
Born in the USA	0.119	0.012	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.010	0.007	0.117
Born in Southern or Eastern Europe	0.318	0.006	0.000
Born in the Middle East	0.483	0.018	0.000
Born in South or Southeast Asia	0.529	0.008	0.000
Born in East Asia	0.382	0.011	0.000
Born in Africa	0.324	0.017	0.000
Born in Latin America	0.448	0.009	0.000
Medium-sized urban area	0.079	0.003	0.000
Small urban or rural area	0.158	0.004	0.000
Unknown rural or urban area	0.349	0.004	0.000
Constant	1.069	0.007	0.000

Table 22: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 25-50, 1991

Obs.	984195		
R-squared	0.098		
Root MSE	1.065		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.002	0.000	0.000
Single, never married	0.010	0.004	0.014
Common law	-0.840	0.004	0.000
Widowed, separated, or divorced	0.224	0.004	0.000
Census family income	0.0025	0.000	0.000
Estimated wage	-0.152	0.001	0.000
Quebec	-0.003	0.003	0.248
Atlantic Canada	0.047	0.004	0.000
Manitoba and Saskatchewan	0.159	0.005	0.000
Alberta	0.052	0.004	0.000
British Columbia	-0.040	0.004	0.000
High school diploma	0.003	0.003	0.238
Colleges, trades, or some CEGEP	-0.067	0.003	0.000
Bachelor level degree	-0.168	0.004	0.000
Advanced degree	-0.208	0.006	0.000
Born in the USA	0.149	0.012	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.005	0.007	0.462
Born in Southern or Eastern Europe	0.248	0.007	0.000
Born in the Middle East	0.588	0.015	0.000
Born in South or Southeast Asia	0.485	0.007	0.000
Born in East Asia	0.248	0.008	0.000
Born in Africa	0.302	0.014	0.000
Born in Latin America	0.448	0.008	0.000
Medium-sized urban area	0.052	0.003	0.000
Small urban or rural area	0.131	0.004	0.000
Unknown rural or urban area	0.276	0.003	0.000
Constant	1.451	0.007	0.000

Table 23: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 25-50, 1996

Obs.	1059590		
R-squared	0.085		
Root MSE	1.091		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.004	0.000	0.000
Single, never married	-0.010	0.004	0.004
Common law	-0.740	0.004	0.000
Widowed, separated, or divorced	0.168	0.004	0.000
Census family income	0.0022	0.000	0.000
Estimated wage	-0.151	0.001	0.000
Quebec	0.024	0.003	0.000
Atlantic Canada	-0.067	0.004	0.000
Manitoba and Saskatchewan	0.136	0.005	0.000
Alberta	0.028	0.004	0.000
British Columbia	-0.065	0.003	0.000
High school diploma	0.005	0.003	0.097
Colleges, trades, or some CEGEP	-0.056	0.003	0.000
Bachelor level degree	-0.155	0.004	0.000
Advanced degree	-0.186	0.005	0.000
Born in the USA	0.122	0.012	0.000
Born in Northern or Western Europe, Australia, or New Zealand	-0.011	0.008	0.151
Born in Southern or Eastern Europe	0.097	0.007	0.000
Born in the Middle East	0.558	0.012	0.000
Born in South or Southeast Asia	0.348	0.006	0.000
Born in East Asia	0.173	0.007	0.000
Born in Africa	0.405	0.012	0.000
Born in Latin America	0.367	0.007	0.000
Medium-sized urban area	0.039	0.003	0.000
Small urban or rural area	0.108	0.004	0.000
Unknown rural or urban area	0.236	0.003	0.000
Constant	1.612	0.007	0.000

Table 24: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 25-50, 2001

Obs.	1043895		
R-squared	0.112		
Root MSE	1.071		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.004	0.000	0.000
Single, never married	-0.716	0.003	0.000
Common law	-0.105	0.004	0.000
Widowed, separated, or divorced	-0.137	0.003	0.000
Census family income	0.00053	0.000	0.000
Estimated wage	-0.095	0.001	0.000
Quebec	0.074	0.003	0.000
Atlantic Canada	-0.121	0.004	0.000
Manitoba and Saskatchewan	0.110	0.005	0.000
Alberta	0.000	0.004	0.988
British Columbia	-0.056	0.003	0.000
High school diploma	-0.008	0.003	0.015
Colleges, trades, or some CEGEP	-0.046	0.003	0.000
Bachelor level degree	-0.192	0.004	0.000
Advanced degree	-0.231	0.005	0.000
Born in the USA	0.145	0.013	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.040	0.009	0.000
Born in Southern or Eastern Europe	-0.008	0.007	0.249
Born in the Middle East	0.388	0.010	0.000
Born in South or Southeast Asia	0.248	0.005	0.000
Born in East Asia	-0.122	0.006	0.000
Born in Africa	0.480	0.010	0.000
Born in Latin America	0.361	0.007	0.000
Medium-sized urban area	0.058	0.003	0.000
Small urban or rural area	0.149	0.003	0.000
Constant	1.380	0.007	0.000

Table 25: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 25-50, 2006

Obs.	1059315		
R-squared	0.084		
Root MSE	1.065		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.003	0.000	0.000
Single, never married	0.054	0.003	0.000
Common law	-0.680	0.004	0.000
Widowed, separated, or divorced	0.146	0.003	0.000
Census family income	0.00064	0.000	0.000
Estimated wage	-0.049	0.000	0.000
Quebec	0.029	0.003	0.000
Atlantic Canada	-0.157	0.004	0.000
Manitoba and Saskatchewan	0.074	0.005	0.000
Alberta	-0.053	0.004	0.000
British Columbia	-0.092	0.003	0.000
High school diploma	-0.060	0.004	0.000
Colleges, trades, or some CEGEP	-0.078	0.004	0.000
Bachelor level degree	-0.178	0.004	0.000
Advanced degree	-0.237	0.005	0.000
Born in the USA	0.061	0.014	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.061	0.009	0.000
Born in Southern or Eastern Europe	-0.070	0.007	0.000
Born in the Middle East	0.465	0.009	0.000
Born in South or Southeast Asia	0.256	0.005	0.000
Born in East Asia	-0.131	0.006	0.000
Born in Africa	0.464	0.009	0.000
Born in Latin America	0.227	0.007	0.000
Medium-sized urban area	0.012	0.003	0.000
Small urban or rural area	0.102	0.003	0.000
Constant	1.472	0.007	0.000

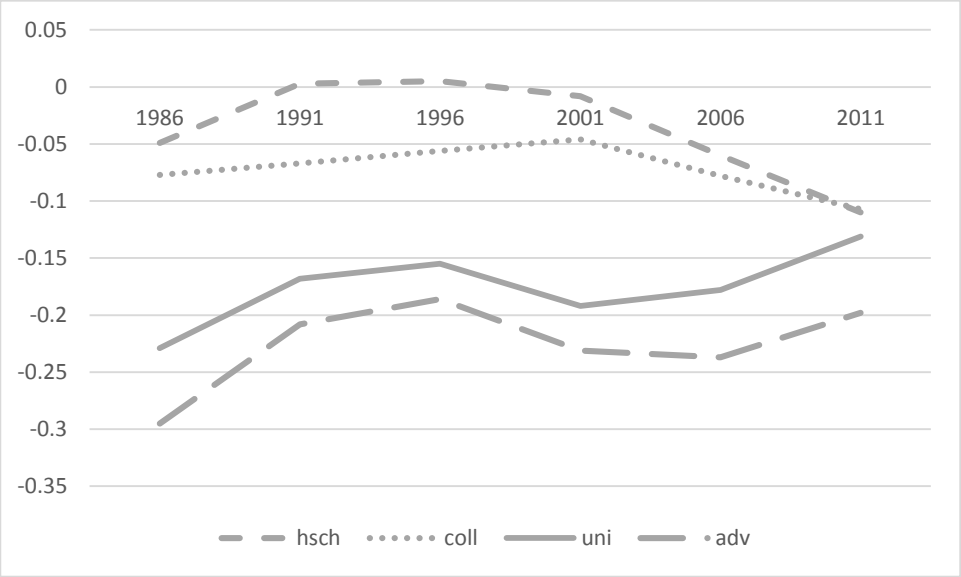
Table 26: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 25-50, 2011

Obs.	1074265		
R-squared	0.089		
Root MSE	1.060		
	Coefficient	**Standard Error**	**P-value**
Age in years	0.008	0.000	0.000
Single, never married	0.092	0.003	0.000
Common law	-0.654	0.003	0.000
Widowed, separated, or divorced	0.181	0.004	0.000
Census family income	0.00099	0.000	0.000
Estimated wage	-0.237	0.002	0.000
Quebec	0.057	0.003	0.000
Atlantic Canada	-0.188	0.004	0.000
Manitoba and Saskatchewan	0.074	0.005	0.000
Alberta	-0.065	0.004	0.000
British Columbia	-0.119	0.003	0.000
High school diploma	-0.110	0.004	0.000
Colleges, trades, or some CEGEP	-0.107	0.004	0.000
Bachelor level degree	-0.131	0.004	0.000
Advanced degree	-0.198	0.005	0.000
Born in the USA	0.078	0.015	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.014	0.010	0.136
Born in Southern or Eastern Europe	-0.094	0.007	0.000
Born in the Middle East	0.380	0.008	0.000
Born in South or Southeast Asia	0.238	0.004	0.000
Born in East Asia	-0.154	0.006	0.000
Born in Africa	0.453	0.008	0.000
Born in Latin America	0.138	0.007	0.000
Medium-sized urban area	0.018	0.003	0.000
Small urban or rural area	0.118	0.003	0.000
Constant	1.410	0.007	0.000

Once the predicted wage is used, the effects of educational level differ from the previous results for the sample aged 25 to 50 in that the coefficients converge much more dramatically by 2011. They are shown in **Figure 17** below. This convergence occurs since the coefficients on having a Bachelor's degree or

an advanced degree increase through 2006 and 2011, whereas with the weekly wage calculated from census data these coefficients fell over the same time frame. Based on this analysis, by 2011 women with high school, some college or equivalent, or a Bachelor's degree have nearly the same negative effect on the number of children per census family, while those with an advanced degree have a slightly larger negative effect.

Figure 17: The Effects of Education on the Number of Children Using Predicted Wages, from 1986-2011. Sample Aged 25 to 50



The coefficients on census family income and the predicted female weekly wage are shown in **Figure 18**. In contrast to the results where the weekly wage is calculated from census data, where the effects of census family income decline over time, when the predicted wage is employed the effects of census family

income are much smaller – practically zero – over the interval from 1986 to 2011. Only the wage effect, or substitution effect, fluctuates over time. However, this is also smoothed in comparison to the previous regression using weekly wages. The effect of predicted weekly wages is one order of magnitude greater and no longer falls sharply in 1996. This indicates that there was a relatively lesser negative effect of the female wage on fertility from 1991 to 2006. It is not, unfortunately, within the scope of this paper to investigate why this might be the case.

Figure 18: The Effects of Family Income and Predicted Female Weekly Wage on the Number of Children per Census Family, from 1986-2011. Sample Aged 25-50

Regression Results for the Sample Aged 35 to 50

Tables 27 to 32 show the regression results for the sample aged 35 to 50 using the predicted female weekly wage as the opportunity cost of time in the labour market. Analogous to the sample aged 25 to 50, the coefficients on the predicted wage are significantly greater in magnitude than those on the weekly wage calculated previously. The effects of census family income are similar, being relatively small but positive.

Coefficients on levels of education are comparable to those when the weekly wage was calculated until 1996, when the effect of advanced degrees on the number of children per census family becomes slightly positive in the case of the predicted weekly wage, as opposed to slightly negative. This difference persists in 2001, and in 2011 the negative effect of an advanced degree is much slighter than in the case with the calculated weekly wage.

Again, differences among the coefficients on those regressors of secondary interest are minor. In 1991 the effect of residence in Alberta changes sign once the predicted wage is employed, and in 2006 residence in Manitoba has a larger and opposite effect. In general, the effects of area of residence seem slightly smaller, and the effects of immigrants' country of birth are similar.

Table 27: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 35-50, 1986

Obs.	476570		
R-squared	0.074		
Root MSE	1.119		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.049	0.000	0.000
Single, never married	-0.337	0.010	0.000
Widowed, separated, or divorced	0.146	0.006	0.000
Census family income	0.0037	0.000	0.000
Estimated wage	-0.210	0.002	0.000
Quebec	0.000	0.004	0.913
Atlantic Canada	0.186	0.006	0.000
Manitoba and Saskatchewan	0.115	0.007	0.000
Alberta	-0.017	0.006	0.008
British Columbia	-0.128	0.006	0.000
High school diploma	-0.040	0.004	0.000
Colleges, trades, or some CEGEP	-0.004	0.004	0.299
Bachelor level degree	-0.079	0.007	0.000
Advanced degree	-0.222	0.010	0.000
Born in the USA	0.064	0.016	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.059	0.008	0.000
Born in Southern or Eastern Europe	0.356	0.008	0.000
Born in the Middle East	0.468	0.024	0.000
Born in South or Southeast Asia	0.552	0.011	0.000
Born in East Asia	0.512	0.014	0.000
Born in Africa	0.382	0.023	0.000
Born in Latin America	0.453	0.011	0.000
Medium-sized urban area	0.067	0.005	0.000
Small urban or rural area	0.082	0.005	0.000
Unknown rural or urban area	0.253	0.005	0.000
Constant	3.510	0.016	0.000

Table 28: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 35-50, 1991

Obs.	564425		
R-squared	0.122		
Root MSE	1.049		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.059	0.000	0.000
Single, never married	-0.295	0.007	0.000
Common law	-0.788	0.007	0.000
Widowed, separated, or divorced	0.077	0.005	0.000
Census family income	0.0024	0.000	0.000
Estimated wage	-0.087	0.001	0.000
Quebec	0.005	0.004	0.164
Atlantic Canada	0.084	0.006	0.000
Manitoba and Saskatchewan	0.121	0.006	0.000
Alberta	0.001	0.005	0.845
British Columbia	-0.096	0.005	0.000
High school diploma	0.041	0.004	0.000
Colleges, trades, or some CEGEP	0.049	0.004	0.000
Bachelor level degree	0.053	0.006	0.000
Advanced degree	-0.068	0.007	0.000
Born in the USA	0.129	0.013	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.082	0.008	0.000
Born in Southern or Eastern Europe	0.324	0.007	0.000
Born in the Middle East	0.700	0.019	0.000
Born in South or Southeast Asia	0.538	0.008	0.000
Born in East Asia	0.362	0.010	0.000
Born in Africa	0.368	0.017	0.000
Born in Latin America	0.493	0.009	0.000
Medium-sized urban area	0.033	0.004	0.000
Small urban or rural area	0.055	0.005	0.000
Unknown rural or urban area	0.167	0.004	0.000
Constant	3.892	0.014	0.000

Table 29: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 35-50, 1996

Obs.	663830		
R-squared	0.117		
Root MSE	1.066		
	Coefficient	Standard Error	P-value
Age in years	-0.056	0.000	0.000
Single, never married	-0.254	0.006	0.000
Common law	-0.705	0.006	0.000
Widowed, separated, or divorced	0.045	0.004	0.000
Census family income	0.00201	0.000	0.000
Estimated wage	-0.093	0.001	0.000
Quebec	0.005	0.004	0.156
Atlantic Canada	-0.040	0.005	0.000
Manitoba and Saskatchewan	0.101	0.006	0.000
Alberta	-0.003	0.005	0.484
British Columbia	-0.077	0.004	0.000
High school diploma	0.062	0.004	0.000
Colleges, trades, or some CEGEP	0.043	0.004	0.000
Bachelor level degree	0.094	0.005	0.000
Advanced degree	0.008	0.007	0.223
Born in the USA	0.119	0.013	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.073	0.009	0.000
Born in Southern or Eastern Europe	0.194	0.008	0.000
Born in the Middle East	0.692	0.015	0.000
Born in South or Southeast Asia	0.442	0.007	0.000
Born in East Asia	0.256	0.008	0.000
Born in Africa	0.491	0.014	0.000
Born in Latin America	0.458	0.008	0.000
Medium-sized urban area	0.022	0.004	0.000
Small urban or rural area	0.048	0.004	0.000
Unknown rural or urban area	0.148	0.004	0.000
Constant	3.847	0.013	0.000

Table 30: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 35-50, 2001

Obs.	701550		
R-squared	0.117		
Root MSE	1.050		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.050	0.000	0.000
Single, never married	-0.637	0.005	0.000
Common law	-0.341	0.005	0.000
Widowed, separated, or divorced	-0.103	0.004	0.000
Census family income	0.00086	0.000	0.000
Estimated wage	-0.060	0.001	0.000
Quebec	0.031	0.003	0.000
Atlantic Canada	-0.139	0.005	0.000
Manitoba and Saskatchewan	0.058	0.005	0.000
Alberta	-0.025	0.005	0.000
British Columbia	-0.063	0.004	0.000
High school diploma	0.071	0.004	0.000
Colleges, trades, or some CEGEP	0.055	0.004	0.000
Bachelor level degree	0.093	0.005	0.000
Advanced degree	0.016	0.006	0.008
Born in the USA	0.117	0.015	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.071	0.010	0.000
Born in Southern or Eastern Europe	0.031	0.008	0.000
Born in the Middle East	0.519	0.013	0.000
Born in South or Southeast Asia	0.325	0.006	0.000
Born in East Asia	-0.037	0.007	0.000
Born in Africa	0.544	0.012	0.000
Born in Latin America	0.404	0.008	0.000
Medium-sized urban area	0.020	0.004	0.000
Small urban or rural area	0.047	0.004	0.000
Constant	3.661	0.013	0.000

Table 31: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 35-50, 2006

Obs.	716235		
R-squared	0.094		
Root MSE	1.052		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.040	0.000	0.000
Single, never married	-0.171	0.005	0.000
Common law	-0.549	0.005	0.000
Widowed, separated, or divorced	0.021	0.004	0.000
Census family income	0.00057	0.000	0.000
Estimated wage	-0.031	0.001	0.000
Quebec	0.026	0.003	0.000
Atlantic Canada	-0.180	0.005	0.000
Manitoba and Saskatchewan	0.037	0.006	0.000
Alberta	-0.067	0.005	0.000
British Columbia	-0.105	0.004	0.000
High school diploma	0.011	0.004	0.014
Colleges, trades, or some CEGEP	0.015	0.004	0.000
Bachelor level degree	0.021	0.005	0.000
Advanced degree	-0.051	0.006	0.000
Born in the USA	0.070	0.016	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.084	0.010	0.000
Born in Southern or Eastern Europe	-0.081	0.008	0.000
Born in the Middle East	0.514	0.011	0.000
Born in South or Southeast Asia	0.300	0.006	0.000
Born in East Asia	-0.146	0.007	0.000
Born in Africa	0.558	0.011	0.000
Born in Latin America	0.266	0.008	0.000
Medium-sized urban area	0.004	0.003	0.200
Small urban or rural area	0.018	0.003	0.000
Constant	3.369	0.013	0.000

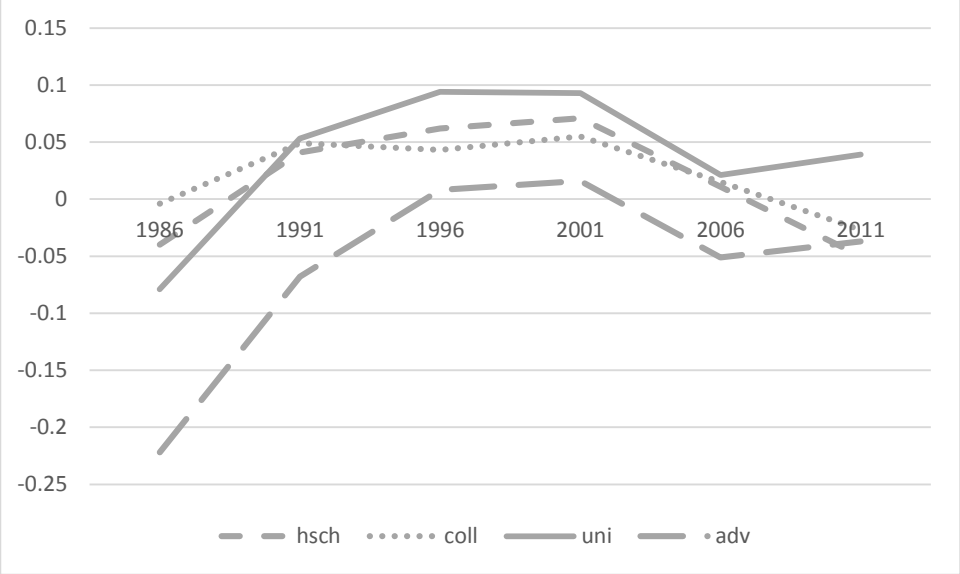
Table 32: OLS Regression on the Number of Children per Census Family Using Estimated Weekly Wages, Sample Aged 35-50, 2011

Obs.	708925		
R-squared	0.089		
Root MSE	1.042		
	Coefficient	**Standard Error**	**P-value**
Age in years	-0.035	0.000	0.000
Single, never married	-0.123	0.004	0.000
Common law	-0.486	0.005	0.000
Widowed, separated, or divorced	0.058	0.004	0.000
Census family income	0.00085	0.000	0.000
Estimated wage	-0.170	0.002	0.000
Quebec	0.036	0.003	0.000
Atlantic Canada	-0.218	0.005	0.000
Manitoba and Saskatchewan	0.044	0.006	0.000
Alberta	-0.075	0.004	0.000
British Columbia	-0.118	0.004	0.000
High school diploma	-0.050	0.005	0.000
Colleges, trades, or some CEGEP	-0.027	0.005	0.000
Bachelor level degree	0.039	0.005	0.000
Advanced degree	-0.037	0.006	0.000
Born in the USA	0.109	0.018	0.000
Born in Northern or Western Europe, Australia, or New Zealand	0.044	0.011	0.000
Born in Southern or Eastern Europe	-0.138	0.008	0.000
Born in the Middle East	0.396	0.010	0.000
Born in South or Southeast Asia	0.241	0.005	0.000
Born in East Asia	-0.194	0.006	0.000
Born in Africa	0.535	0.009	0.000
Born in Latin America	0.167	0.007	0.000
Medium-sized urban area	0.006	0.003	0.097
Small urban or rural area	0.023	0.004	0.000
Constant	3.279	0.013	0.000

As shown in **Figure 19**, the effects of education over time when using the predicted wage are similar to the previous regressions (using the weekly wage constructed from the data) until 2006. The effects of each education level converge in 2006 but then, instead of dropping off, when the predicted wage is

included the effects of Bachelor's and advanced degrees on the number of children actually increase. Furthermore, the effects of high school diplomas and college (or equivalent) degrees do not decrease as significantly after 2006. These results using a predicted opportunity cost of female time in the labour market are more in keeping with the descriptive analysis for the sample aged 35 to 50; as shown by **Table 7**, by 2011 women with higher levels of education were still having more children than their less educated counterparts, though this could be due to factors other than education.

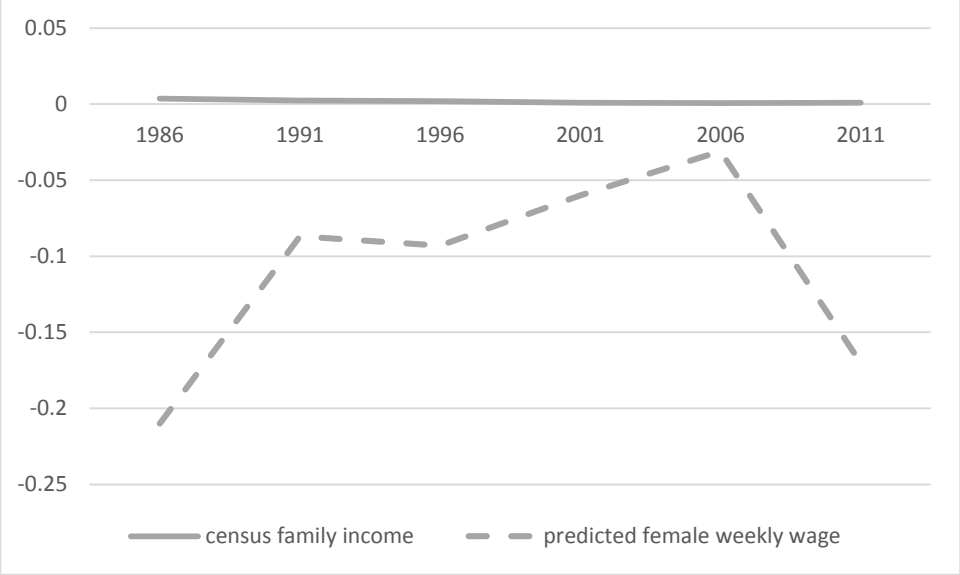
Figure 19: The Effects of Education on the Number of Children Using Predicted Wages, from 1986-2011. Sample Aged 35 to 50



The greater mean numbers of children per census family among women with higher levels of education cannot be attributed to higher census family incomes based on this analysis, as **Figure 20** demonstrates once again. Census

family income has a near-constant and negligible effect on the number of children among women aged 35 to 50, outweighed by the negative effect of the predicted female wage. Like the sample aged 25 to 50, when the predicted wage is included rather than the calculated weekly wage the effects of female wages are smoothed and do not experience any sharp drops between 1991 and 2006.

Figure 20: The Effects of Family Income and Predicted Female Weekly Wage on the Number of Children per Census Family, from 1986-2011. Sample Aged 35-50



Conclusion

From 1986 to 2011 in Canada the average number of children per woman aged 25 to 50 has fallen from 1.675 to 1.521 children per census family, and

among women aged 35 to 50 it has fallen from 1.802 to 1.631. This would imply that completed family sizes have dropped more than average family sizes in general. However, an important caveat is that, considering how the average age at first birth has been rising, especially for highly educated women, in later survey years the sample aged 35 to 50 may include a greater fraction of women who have not completed their fertility than in earlier years.

The effects of education differ by age sample. Higher levels of education generally have a negative effect on fertility, with exemption among women aged 35 to 50, where all but those with advanced degrees had a positive effect on the number of children per census family. Yet there has been a weakening and a convergence of education effects over time, which showed strongest in the sample aged 25 to 50. This may indicate that education effects are operating mainly through the postponement of births rather than the number of children.

A woman's opportunity cost of time consistently enters as negative, and dominates the positive but negligible family income effects. However, these own-wage and family income effects also lessened over time. There is a possible reversal of this trend in 2011, when own-wage effects on the number of children increase in magnitude, and simultaneously, for both age samples education effects enter as negative once more. Since education determines wages in part, negative education effects could be responsible for greater negative wage effects.

Common law unions have a strong, negative effect on the number of children per census family. Rather than finding that low fertility rates might be attributed to Quebec residency specifically, the low fertility rates which lead to policies such as the ANC are instead attributed to common law attachments. This effect is more pronounced in the 25 to 50 year old sample, so it is possible that common law couples who have children do so later in life, or choose to get formally married.

Immigrants born in Africa, the Middle East, South and Southeast Asia, and Latin America, have large positive effects on Canadian fertility rates throughout the period. Southern or Eastern Europeans, as well as East Asians, once had similar large, positive effects, but have evinced a sharp decline in fertility such that they now have fewer children on average than native-born Canadians. The effects of immigrants' regions of birth are nearly the same size between age samples, which suggests that foreign-born women may be having their children earlier; then the effects are picked up in both age samples.

This paper has provided an up-to-date analysis of Canadian fertility using microdata from the Census of Population and the National Household Survey. Further research could be done concerning nonlinear multinomial logit, or linear ordered probit/logit analysis using this data.

Appendix A

Descriptive Analysis, Sample Aged 25-50

Table A1: Mean number of Children by Women's Place of Birth in 1986, Sample Aged 25-50

1986: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.675	1.117
Native-born	86.13%	1.646	1.111
United States	0.94%	1.697	1.241
Western/Northern Europe, Australia and New Zealand	3.33%	1.647	1.109
Southern and Eastern Europe	3.45%	1.925	1.059
The Middle East	0.41%	2.017	1.148
South and Southeast Asia	2.16%	1.983	1.185
East Asia	1.20%	1.874	1.141
Africa	0.44%	1.817	1.067
Latin America	1.94%	1.952	1.180

Table A2: Mean number of Children by Women's Place of Birth in 1991, Sample Aged 25-50

1991: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.575	1.099
Native-born	86.20%	1.537	1.090
United States	0.85%	1.670	1.231
Western/Northern Europe, Australia and New Zealand	2.50%	1.542	1.107
Southern and Eastern Europe	2.72%	1.789	1.017
The Middle East	0.52%	2.129	1.213
South and Southeast Asia	2.82%	1.964	1.175
East Asia	1.68%	1.735	1.065
Africa	0.59%	1.793	1.106
Latin America	2.12%	1.932	1.154

Table A3: Mean number of Children by Women's Place of Birth in 1996, Sample Aged 25-50

1996: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.579	1.100
Native-born	84.69%	1.541	1.090
United States	0.76%	1.663	1.243
Western/Northern Europe, Australia and New Zealand	1.86%	1.535	1.127
Southern and Eastern Europe	2.57%	1.661	0.975
The Middle East	0.73%	2.155	1.266
South and Southeast Asia	3.70%	1.882	1.161
East Asia	2.48%	1.705	1.034
Africa	0.87%	1.962	1.190-
Latin America	2.35%	1.914	1.155

Table A4: Mean number of Children by Women's Place of Birth in 2001, Sample Aged 25-50

2001: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.267	1.167
Native-born	83.56%	1.222	1.155
United States	0.61%	1.526	1.287
Western/Northern Europe, Australia and New Zealand	1.39%	1.360	1.197
Southern and Eastern Europe	2.48	1.413	1.017
The Middle East	1.01%	1.814	1.348
South and Southeast Asia	4.50%	1.571	1.213
East Asia	3.04%	1.235	1.029
Africa	1.06%	1.762	1.374
Latin America	2.34%	1.619	1.270

Table A5: Mean number of Children by Women's Place of Birth in 2006, Sample Aged 25-50

2006: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.522	1.091
Native-born	81.80%	1.481	1.084
United States	0.51%	1.588	1.252
Western/Northern Europe, Australia and New Zealand	1.21%	1.559	1.148
Southern and Eastern Europe	2.35%	1.466	0.947
The Middle East	1.27%	2.065	1.257
South and Southeast Asia	5.52%	1.803	1.087
East Asia	3.44%	1.406	0.911
Africa	1.40%	2.040	1.273
Latin America	2.42%	1.800	1.141

Table A6: Mean number of Children by Women's Place of Birth in 2011, Sample Aged 25-50

2011: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.521	1.086
Native-born	80.09%	1.476	1.080
United States	0.41%	1.609	1.301
Western/Northern Europe, Australia and New Zealand	1.12%	1.512	1.120
Southern and Eastern Europe	2.21%	1.444	0.939
The Middle East	1.55%	1.982	1.244
South and Southeast Asia	6.53%	1.790	1.054
East Asia	3.57%	1.386	0.892
Africa	1.87%	2.042	1.247
Latin America	2.56%	1.722	1.126

Table A7: Mean number of Children by Residence in Quebec or the Rest of Canada, Sample Aged 25-50

Number of Children per Census Family in Quebec and the Rest of Canada			
		Mean number of children	*Standard deviation*
1986	*Sample*	1.675	1.117
	Quebec	1.618	1.078
	ROC	1.695	1.130
1991	*Sample*	1.575	1.099
	Quebec	1.493	1.044
	ROC	1.604	1.12
1996	*Sample*	1.579	1.100
	Quebec	1.511	1.043
	ROC	1.602	1.117
2001	*Sample*	1.268	1.167
	Quebec	1.202	1.120
	ROC	1.288	1.180
2006	*Sample*	1.522	1.091
	Quebec	1.452	1.059
	ROC	1.543	1.100
2011	*Sample*	1.521	1.086
	Quebec	1.478	1.06
	ROC	1.533	1.092

Descriptive Analysis, Sample Aged 35-50

Table A8: Mean number of Children by Women's Place of Birth in 1986, Sample Aged 35-50

1986: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.802	1.124
Native-born	81.81%	1.773	1.119
United States	1.12%	1.779	1.235
Western/Northern Europe, Australia and New Zealand	5.13%	1.689	1.105
Southern and Eastern Europe	5.10%	1.972	1.074
The Middle East	0.46%	2.124	1.127
South and Southeast Asia	2.19%	2.165	1.169
East Asia	1.40%	2.124	1.098
Africa	0.50%	2.020	1.005
Latin America	2.27%	2.074	1.183

Table A9: Mean number of Children by Women's Place of Birth in 1991, Sample Aged 35-50

1991: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.669	1.095
Native-born	82.97%	1.621	1.087
United States	1.11%	1.728	1.220
Western/Northern Europe, Australia and New Zealand	3.58%	1.589	1.097
Southern and Eastern Europe	3.78%	1.865	1.014
The Middle East	0.52%	2.317	1.149
South and Southeast Asia	2.94%	2.120	1.126
East Asia	1.94%	1.957	0.992
Africa	0.66%	1.965	1.056
Latin America	2.50%	2.026	1.135

Table A10: Mean number of Children by Women's Place of Birth in 1996, Sample Aged 35-50

1996: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.660	1.196
Native-born	82.84%	1.610	1.088
United States	0.96%	1.709	1.240
Western/Northern Europe, Australia and New Zealand	2.33%	1.600	1.125
Southern and Eastern Europe	3.14%	1.758	0.969
The Middle East	0.71%	2.345	1.212
South and Southeast Asia	3.75%	2.059	1.129
East Asia	2.81%	1.847	0.963
Africa	0.87%	2.115	1.141
Latin America	2.59%	2.010	1.140

Table A11: Mean number of Children by Women's Place of Birth in 2001, Sample Aged 35-50

2001: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.418	1.166
Native-born	82.53%	1.363	1.156
United States	0.73%	1.575	1.284
Western/Northern Europe, Australia and New Zealand	1.63%	1.469	1.199
Southern and Eastern Europe	2.78%	1.552	0.995
The Middle East	0.96%	2.082	1.312
South and Southeast Asia	4.53%	1.773	1.218
East Asia	3.27%	1.483	0.993
Africa	1.03%	2.024	1.339
Latin America	2.53	1.761	1.260

Table A12: Mean number of Children by Women's Place of Birth in 2006, Sample Aged 35-50

2006: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.616	1.081
Native-born	80.36%	1.565	1.076
United States	0.61%	1.666	1.233
Western/Northern Europe, Australia and New Zealand	1.45%	1.678	1.130
Southern and Eastern Europe	2.67%	1.572	0.915
The Middle East	1.27%	2.219	1.221
South and Southeast Asia	5.61%	1.967	1.068
East Asia	3.88%	1.520	0.862
Africa	1.36%	2.255	1.232
Latin America	2.73%	1.905	1.113

Table A13: Mean number of Children by Women's Place of Birth in 2011, Sample Aged 35-50

2011: Number of Children by Place of Birth			
	Percentage of sample	Mean number of children	Standard deviation
Sample	-	1.631	1.063
Native-born	77.59%	1.578	1.058
United States	0.47%	1.739	1.298
Western/Northern Europe, Australia and New Zealand	1.36%	1.653	1.098
Southern and Eastern Europe	2.61%	1.534	0.918
The Middle East	1.64%	2.126	1.203
South and Southeast Asia	7.07%	1.938	1.023
East Asia	4.33%	1.476	0.850
Africa	1.91%	2.260	1.224
Latin America	2.93%	1.838	1.088

Table A14: Mean number of Children by Residence in Quebec or the Rest of Canada, Sample Aged 35-50

Number of Children per Census Family in Quebec and the Rest of Canada			
		Mean number of children	*Standard deviation*
1986	*Sample*	1.802	1.124
	Quebec	1.775	1.086
	ROC	1.812	1.137
1991	*Sample*	1.669	1.095
	Quebec	1.598	1.044
	ROC	1.694	1.111
1996	*Sample*	1.660	1.096
	Quebec	1.576	1.038
	ROC	1.689	1.113
2001	*Sample*	1.418	1.166
	Quebec	1.308	1.126
	ROC	1.453	1.177
2006	*Sample*	1.616	1.081
	Quebec	1.544	1.058
	ROC	1.64	1.09
2011	*Sample*	1.631	1.063
	Quebec	1.582	1.051
	ROC	1.645	1.067

Appendix B

Wage Estimation, Sample Aged 25-50

Table B1: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 25-50, 1986

Obs.	752295		
R-squared	0.0777		
Root MSE	1042.8		
	Coefficient	**Standard Error**	**P-value**
Age	14.5578	1.827339	0.000
Age squared	-0.1857435	0.024804	0.000
High school diploma	17.1001	3.445552	0.000
College, trades, or some CEGEP	31.18941	3.361715	0.000
Bachelor's degree	100.6918	4.93483	0.000
Advanced degree	132.5967	6.903784	0.000
Immigrant status	-13.63617	6.282493	0.030
Years since immigration	0.0055618	0.002802	0.047
Atlantic Canada	-19.02284	4.818483	0.000
Quebec	-1.976078	3.190451	0.536
Manitoba and Saskatchewan	-9.048798	4.815863	0.06
Alberta	9.766187	4.283648	0.023
British Columbia	24.45707	4.069129	0.000
Occupation not given	7.306261	14.35797	0.611
Management occupations	118.1994	8.242248	0.000
Scientists, professionals, and educators	90.75424	8.362948	0.000
Healthcare	78.33472	8.452149	0.000
Occupations in culture, sports, and recreation	11.25346	10.70494	0.293
Clerical and related occupations	14.80832	7.136336	0.038
Business and sales occupations	18.34823	8.250085	0.026
Military and protective services	46.59245	16.97769	0.006
Food, accommodation, and related occupations	-1.485769	7.973534	0.852
Agriculture, fishing, hunting, and forestry occupations	-79.34738	12.48198	0.000
Mining and processing occupations	39.29139	11.02043	0.000
Construction and trades occupations	46.68617	21.01595	0.026
Transportation, storage, and utilities	6.588284	9.981397	0.509
Other occupations	1.012808	22.72829	0.964

Agriculture and food industries	-12.00463	13.27821	0.366
Forestry and mining	-35.81497	9.342976	0.000
Textiles and clothing	75.08203	13.23425	0.000
Construction	-44.65418	8.604914	0.000
Transportation, storage, and utilities	-40.42202	11.30187	0.000
Wholesale and retail industries	29.61709	7.433196	0.000
Finance, insurance, and real estate	-37.06676	6.208609	0.000
Health, education, and religion	0.7695098	6.696828	0.909
Arts and recreation	-3.639663	6.236398	0.559
Service industries	-37.81129	13.13538	0.004
Government	-35.59721	6.230822	0.000
Other industries	22.75273	6.873819	0.001
Full time work	1413.407	6.014858	0.000
Part time work	1280.651	6.275404	0.000
Constant	-1360.062	34.39249	0.000

Table B2: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 25-50, 1991

Obs.	930225		
R-squared	0.104		
Root MSE	1415.400		
	Coefficient	**Standard Error**	**P-value**
Age	18.362	2.325	0.000
Age squared	-0.235	0.031	0.000
High school diploma	11.823	4.306	0.006
College, trades, or some CEGEP	34.143	4.282	0.000
Bachelor's degree	123.911	5.948	0.000
Advanced degree	181.786	7.951	0.000
Immigrant status	-12.729	12.963	0.326
Years since immigration	0.761	0.435	0.080
Atlantic Canada	-47.195	5.858	0.000
Quebec	-40.182	3.870	0.000
Manitoba and Saskatchewan	-47.392	6.053	0.000
Alberta	-21.155	5.290	0.000
British Columbia	8.091	4.851	0.095
Occupation not given	79.217	14.673	0.000
Management occupations	161.494	10.551	0.000
Scientists, professionals, and educators	118.197	10.885	0.000
Healthcare	108.233	11.209	0.000
Occupations in culture, sports, and recreation	25.715	14.774	0.082

Clerical and related occupations	31.500	9.641	0.001
Business and sales occupations	50.599	10.734	0.000
Military and protective services	73.683	19.891	0.000
Food, accommodation, and related occupations	-13.858	10.488	0.186
Agriculture, fishing, hunting, and forestry occupations	-69.441	16.208	0.000
Mining and processing occupations	59.170	14.788	0.000
Construction and trades occupations	77.389	23.883	0.001
Transportation, storage, and utilities	9.065	13.167	0.491
Other or unspecified occupations	8.094	26.565	0.761
Agriculture and food industries	-71.501	11.718	0.000
Forestry and mining	97.263	17.715	0.000
Textiles and clothing	-59.448	11.751	0.000
Construction	-28.316	13.343	0.034
Transportation, storage, and utilities	31.236	9.205	0.001
Wholesale and retail industries	-72.274	7.763	0.000
Finance, insurance, and real estate	-20.747	8.365	0.013
Health, education, and religion	-22.569	7.748	0.004
Arts and recreation	-44.563	15.763	0.005
Service industries	-51.199	7.721	0.000
Government	27.953	8.530	0.001
Other industries	-42.775	13.024	0.001
Full time work	2539.800	8.157	0.000
Part Time work	2380.009	8.544	0.000
Constant	-2456.082	42.892	0.000

Table B3: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 25-50, 1996

Obs.	975700		
R-squared	0.094		
Root MSE	1325.000		
	Coefficient	**Standard Error**	**P-value**
Age	28.802	2.080	0.000
Age squared	-0.335	0.028	0.000
High school diploma	18.829	4.239	0.000
College, trades, or some CEGEP	46.824	4.138	0.000
Bachelor's degree	149.834	5.366	0.000
Advanced degree	212.424	7.016	0.000
Immigrant status	-48.951	6.954	0.000

Years since immigration	0.004	0.003	0.195
Atlantic Canada	-87.197	5.413	0.000
Quebec	-57.322	3.575	0.000
Manitoba and Saskatchewan	-77.610	5.607	0.000
Alberta	-41.671	4.819	0.000
British Columbia	3.055	4.286	0.476
Management occupations	180.729	11.368	0.000
Business, finance, and admin	51.789	10.288	0.000
Natural and applied sciences	169.636	13.512	0.000
Healthcare	207.334	11.694	0.000
Social science, education, government, and religion	155.211	11.674	0.000
Occupations in art, culture, recreation, and sport	30.973	12.817	0.016
Sales and service occupations	30.453	10.496	0.004
Occupations in primary industry	10.542	18.258	0.564
Occupations in processing, manufacturing, and utilities	-13.560	12.116	0.263
Agriculture and related industries	-196.607	14.940	0.000
Fishing and trapping	32.611	37.932	0.390
Logging and forestry	35.034	29.522	0.235
Mining and oil	199.348	21.364	0.000
Manufacturing	-64.503	12.178	0.000
Construction	1.467	11.203	0.896
Transportation and storage	92.346	9.723	0.000
Communication and utilities	-8.348	8.902	0.348
Wholesale trade	-122.051	7.078	0.000
Retail industries	8.303	7.832	0.289
Finance and insurance	-70.253	11.013	0.000
Real estate and insurance agent industries	-48.578	7.522	0.000
Business services	56.591	7.723	0.000
Government services	-20.303	7.783	0.009
Education	-89.732	7.063	0.000
Healthcare and social assistance	-139.568	8.083	0.000
Accommodation and food industries	-131.501	7.443	0.000
Full time work	2314.576	8.093	0.000
Part time work	2117.496	8.355	0.000
Constant	-2393.279	40.747	0.000

Table B4: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 25-50, 2001

Obs.	1002810		
R-squared	0.1112		
Root MSE	1599.4		
	Coefficient	**Standard Error**	**P-value**
Age	33.040	2.492	0.000
Age squared	-0.413	0.033	0.000
High school diploma	17.130	5.321	0.001
College, trades, or some CEGEP	56.123	5.123	0.000
Bachelor's degree	223.355	6.306	0.000
Advanced degree	298.904	8.008	0.000
Immigrant status	19.995	13.708	0.145
Years since immigration	3.200	0.440	0.000
Atlantic Canada	-106.802	6.503	0.000
Quebec	-85.318	4.252	0.000
Manitoba and Saskatchewan	-105.211	6.794	0.000
Alberta	-35.543	5.636	0.000
British Columbia	-0.757	5.131	0.883
Management occupations	258.192	12.273	0.000
Business, finance, and admin occupations	52.161	11.239	0.000
Natural and applied science	176.716	13.952	0.000
Healthcare	209.177	13.127	0.000
Social science, education, government, and religion	88.909	12.677	0.000
Occupations in art, culture, recreation, and sport	-1.827	14.615	0.900
Sales and service occupations	68.290	11.592	0.000
Occupations in primary industry	-61.748	22.941	0.007
Occupations in processing, manufacturing, and utilities	-24.597	13.443	0.067
Agriculture, forestry, fishing, and hunting	-118.776	20.256	0.000
Mining, oil and gas extraction	194.102	25.788	0.000
Utilities	153.899	24.084	0.000
Construction	-38.020	14.695	0.010
Wholesale industry	-2.156	10.843	0.842
Retail industry	-156.008	8.660	0.000
Transportation and storage	-12.709	11.575	0.272
Information and cultural industries	70.124	11.646	0.000
Finance and insurance	37.546	9.351	0.000

Real estate	-63.457	15.068	0.000
Professional, scientific, and technical services	-22.726	9.260	0.014
Business management	204.467	46.971	0.000
Administration and support, waste management and remediation	-83.857	10.604	0.000
Education	-51.299	9.466	0.000
Healthcare and social assistance	-130.254	8.720	0.000
Arts, entertainment, and recreation	-134.861	14.366	0.000
Accommodation and food services	-177.946	9.872	0.000
Other services	-172.342	9.988	0.000
Public administration	74.088	9.401	0.000
Full time work	3224.878	9.885	0.000
Part time work	2997.726	10.270	0.000
Constant	-3392.065	48.035	0.000

Table B5: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 25-50, 2006

Obs.	1044495		
R-squared	0.134		
Root MSE	2577.100		
	Coefficient	**Standard Error**	**P-value**
Age	29.275	3.908	0.000
Age squared	-0.346	0.051	0.000
High school diploma	32.642	10.153	0.001
College, trades, or some CEGEP	80.562	9.833	0.000
Bachelor's degree	259.973	11.248	0.000
Advanced degree	304.415	13.164	0.000
Immigrant status	-11.392	21.196	0.591
Years since immigration	1.972	0.670	0.003
Atlantic Canada	-104.775	10.399	0.000
Quebec	-80.590	6.692	0.000
Manitoba and Saskatchewan	-93.993	10.945	0.000
Alberta	-3.330	8.770	0.704
British Columbia	-26.253	8.111	0.001
Management occupations	332.693	17.496	0.000
Business, finance, and admin	58.464	15.683	0.000
Healthcare	164.782	19.724	0.000
Occupations in social science, education, government, and religion	252.459	18.823	0.000
Occupations in art, culture,	93.631	18.001	0.000

recreation, and sport			
Sales and service occupations	-1.034	21.132	0.961
Sales and service occupations	93.681	16.331	0.000
Trades, transport and equipment operators, and related occupations	-23.622	22.151	0.286
Occupations in primary industry	-48.286	33.834	0.154
Agriculture, forestry, fishing, and hunting	-147.646	30.819	0.000
Mining, oil and gas extraction	181.721	34.387	0.000
Utilities	269.700	38.129	0.000
Construction	-88.754	22.296	0.000
Wholesale industry	8.785	17.162	0.609
Retail trade	-179.987	14.049	0.000
Transportation and storage	-22.992	18.831	0.222
Information and cultural industries	50.658	19.416	0.009
Finance and insurance	59.984	15.227	0.000
Real estate	-189.521	23.353	0.000
Professional, scientific, and technical services	-47.448	14.816	0.001
Business management	183.430	70.516	0.009
Administration, waste management, and remediation	-115.822	16.593	0.000
Education	-66.022	15.060	0.000
Healthcare and social assistance	-147.816	14.045	0.000
Arts, entertainment, and recreation	-152.506	22.540	0.000
Accommodation and food services	-204.673	15.947	0.000
Other services	-241.655	15.914	0.000
Public administration	43.022	15.196	0.005
Full time work	5984.674	15.441	0.000
Part time work	5691.669	16.104	0.000
Constant	-5987.955	73.619	0.000

Table B6: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 25-50, 2011

Obs.	1203865		
R-squared	0.116		
Root MSE	1471.700		
	Coefficient	**Standard Error**	**P-value**
Age	33.814	2.065	0.000
Age squared	-0.381	0.027	0.000
High school diploma	-64.501	5.459	0.000

College, trades, or some CEGEP	-41.498	5.237	0.000
Bachelor's degree	168.881	5.797	0.000
Advanced degree	220.273	6.623	0.000
Immigrant status	7.491	10.598	0.480
Years since immigration	2.787	0.331	0.000
Atlantic Canada	-110.223	5.651	0.000
Quebec	-85.485	3.568	0.000
Manitoba and Saskatchewan	-63.525	5.824	0.000
Alberta	44.124	4.564	0.000
British Columbia	-34.051	4.278	0.000
Management occupations	386.219	19.921	0.000
Business, finance, and administration occupations	71.382	19.758	0.000
Natural and applied sciences, and related occupations	280.833	20.881	0.000
Healthcare	364.507	20.477	0.000
Education, law and social sciences, community and government service	95.741	20.161	0.000
Occupations in art, culture, recreation, and sport	-147.146	21.480	0.000
Sales and service occupations	-22.660	19.863	0.254
Trades, transport and equipment operators, and related occupations	-37.598	22.508	0.095
Natural resources, agriculture, and related occupations	-114.167	21.850	0.000
Agriculture, forestry, fishing, and hunting	-403.005	17.006	0.000
Mining, oil and gas extraction	533.330	19.292	0.000
Utilities	395.107	20.954	0.000
Construction	-65.429	13.011	0.000
Wholesale industry	70.903	10.726	0.000
Retail industry	-249.402	8.756	0.000
Transportation and warehousing	-9.046	11.600	0.436
Information and cultural industries	129.165	12.050	0.000
Finance and insurance	123.457	9.376	0.000
Real estate	-170.914	13.728	0.000
Professional, scientific, and technical services	-54.110	9.089	0.000
Business management	100.285	46.320	0.030
Administration, waste management, and remediation	-215.833	10.409	0.000
Education	-18.949	9.277	0.041
Healthcare and social assistance	-196.776	8.725	0.000
Arts, entertainment, and recreation	-199.168	13.541	0.000

Accommodation and food services	-288.047	9.835	0.000
Other services	-320.018	9.825	0.000
Public administration	133.867	9.117	0.000
Full time work	1234.202	21.006	0.000
Part time work	916.489	21.292	0.000
Constant	-1132.459	37.685	0.000

Wage Estimation, Sample Aged 35-50

Table B7: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 35-50, 1986

Obs.	390010		
R-squared	0.080		
Root MSE	1147.600		
	Coefficient	**Standard Error**	**P-value**
Age	-7.523	8.384	0.370
Age squared	0.085	0.099	0.395
High school diploma	16.693	5.318	0.002
College, trades, or some CEGEP	39.314	5.030	0.000
Bachelor's degree	135.167	7.983	0.000
Advanced degree	171.068	10.309	0.000
Immigrant status	-7.372	9.387	0.432
Years since immigration	0.009	0.004	0.039
Atlantic Canada	-20.417	7.441	0.006
Quebec	-1.267	4.914	0.797
Manitoba and Saskatchewan	-26.897	7.413	0.000
Alberta	-8.940	6.695	0.182
British Columbia	11.769	6.126	0.055
Occupation not given	8.686	21.460	0.686
Management occupations	140.681	12.476	0.000
Scientists, professionals, and educators	105.027	12.773	0.000
Healthcare	85.328	12.870	0.000
Occupations in culture, sports, and recreation	17.564	17.731	0.322

Clerical and related occupations	23.150	10.799	0.032
Business and sales occupations	23.707	12.437	0.057
Military and protective services	12.628	27.348	0.644
Food, accommodation, and related occupations	5.774	12.016	0.631
Agriculture, fishing, hunting, and forestry occupations	-82.874	18.735	0.000
Mining and processing occupations	36.297	16.516	0.028
Construction and trades occupations	62.696	32.752	0.056
Transportation, storage, and utilities	14.326	15.095	0.343
Other occupations	47.551	36.847	0.197
Agriculture and food industries	-45.791	14.320	0.001
Forestry and mining	57.016	21.968	0.009
Textiles and clothing	-44.786	12.934	0.001
Construction	-35.589	16.912	0.035
Transportation, storage, and utilities	3.803	11.755	0.746
Wholesale and retail industries	-45.387	9.603	0.000
Finance, insurance, and real estate	3.904	10.669	0.714
Health, education, and religion	-3.480	9.601	0.717
Arts and recreation	-44.100	21.337	0.039
Service industries	-44.200	9.703	0.000
Government	18.290	10.848	0.092
Other industries	-22.754	19.857	0.252
Full time work	1615.580	9.409	0.000
Part time work	1474.831	9.738	0.000
Constant	-1120.353	175.971	0.000

Table B8: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 35-50, 1991

Obs.	519350		
R-squared	0.106		
Root MSE	1500.300		
	Coefficient	**Standard Error**	**P-value**
Age	4.186	9.519	0.660
Age squared	-0.061	0.113	0.588
High school diploma	9.349	6.009	0.120
College, trades, or some CEGEP	41.056	6.007	0.000
Bachelor's degree	147.747	8.727	0.000
Advanced degree	215.367	10.848	0.000
Immigrant status	-9.856	17.323	0.569
Years since immigration	0.795	0.563	0.158

Atlantic Canada	-52.425	8.357	0.000
Quebec	-40.904	5.505	0.000
Manitoba and Saskatchewan	-54.096	8.608	0.000
Alberta	-30.829	7.616	0.000
British Columbia	8.276	6.805	0.224
Occupation not given	137.014	20.599	0.000
Management occupations	203.021	14.740	0.000
Scientists, professionals, and educators	146.176	15.274	0.000
Healthcare	122.245	15.628	0.000
Occupations in culture, sports, and recreation	55.707	21.672	0.010
Clerical and related occupations	46.812	13.484	0.001
Business and sales occupations	62.974	15.053	0.000
Military and protective services	64.264	30.050	0.032
Food, accommodation, and related occupations	2.591	14.685	0.860
Agriculture, fishing, hunting, and forestry occupations	-81.180	22.859	0.000
Mining and processing occupations	70.145	20.870	0.001
Construction and trades occupations	88.390	34.641	0.011
Transportation, storage, and utilities	29.363	18.619	0.115
Other or unspecified occupations	20.033	39.466	0.612
Agriculture and food industries	-67.676	16.923	0.000
Forestry and mining	95.605	26.026	0.000
Textiles and clothing	-58.634	16.527	0.000
Construction	-52.842	18.932	0.005
Transportation, storage, and utilities	29.045	13.380	0.030
Wholesale and retail industries	-80.334	11.246	0.000
Finance, insurance, and real estate	-16.469	12.196	0.177
Health, education, and religion	-24.354	11.062	0.028
Arts and recreation	-77.012	23.510	0.001
Service industries	-60.885	11.230	0.000
Government	16.550	12.262	0.177
Other industries	-44.890	18.528	0.015
Full time work	2843.710	12.074	0.000
Part Time work	2677.324	12.567	0.000
Constant	-2485.487	199.350	0.000

Table B9: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 35-50, 1996

Obs.	600775		
R-squared	0.093		
Root MSE	1387.100		
	Coefficient	**Standard Error**	**P-value**
Age	-8.539	8.181	0.297
Age squared	0.103	0.097	0.285
High school diploma	20.709	5.449	0.000
College, trades, or some CEGEP	56.387	5.378	0.000
Bachelor's degree	182.466	7.387	0.000
Advanced degree	261.153	9.200	0.000
Immigrant status	-47.122	9.493	0.000
Years since immigration	0.006	0.004	0.140
Atlantic Canada	-93.937	7.253	0.000
Quebec	-55.581	4.772	0.000
Manitoba and Saskatchewan	-88.138	7.452	0.000
Alberta	-50.551	6.462	0.000
British Columbia	-0.819	5.725	0.886
Management occupations	212.225	14.807	0.000
Business, finance, and admin	58.258	13.451	0.000
Natural and applied sciences	176.063	18.552	0.000
Healthcare	215.720	15.331	0.000
Social science, education, government, and religion	180.403	15.293	0.000
Occupations in art, culture, recreation, and sport	22.363	17.087	0.191
Sales and service occupations	35.146	13.748	0.011
Occupations in primary industry	2.645	24.564	0.914
Occupations in processing, manufacturing, and utilities	-11.232	15.904	0.480
Agriculture and related industries	-207.172	20.483	0.000
Fishing and trapping	52.274	49.116	0.287
Logging and forestry	52.383	40.017	0.191
Mining and oil	228.760	28.437	0.000
Manufacturing	-61.226	16.049	0.000
Construction	10.866	14.969	0.468
Transportation and storage	93.654	12.878	0.000
Communication and utilities	-8.214	12.204	0.501
Wholesale trade	-130.103	9.606	0.000

Retail industries	21.179	10.582	0.045
Finance and insurance	-87.089	14.433	0.000
Real estate and insurance agent industries	-49.409	10.325	0.000
Business services	66.588	10.218	0.000
Government services	-15.873	10.205	0.120
Education	-94.999	9.461	0.000
Healthcare and social assistance	-156.696	11.192	0.000
Accommodation and food industries	-138.416	10.123	0.000
Full time work	2518.295	11.372	0.000
Part time work	2309.758	11.704	0.000
Constant	-1823.473	172.555	0.000

Table B10: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 35-50, 2001

Obs.	660980		
R-squared	0.110		
Root MSE	1621.600		
	Coefficient	**Standard Error**	**P-value**
Age	18.054	9.191	0.049
Age squared	-0.236	0.108	0.029
High school diploma	26.148	6.359	0.000
College, trades, or some CEGEP	67.329	6.188	0.000
Bachelor's degree	269.950	8.035	0.000
Advanced degree	367.878	10.020	0.000
Immigrant status	-4.951	17.159	0.773
Years since immigration	2.989	0.527	0.000
Atlantic Canada	-117.073	8.126	0.000
Quebec	-93.890	5.304	0.000
Manitoba and Saskatchewan	-118.245	8.443	0.000
Alberta	-40.653	7.087	0.000
British Columbia	-6.784	6.415	0.290
Management occupations	294.628	14.860	0.000
Business, finance, and admin occupations	60.948	13.605	0.000
Natural and applied science	198.696	17.563	0.000
Healthcare	220.382	15.993	0.000
Social science, education, government, and religion	90.813	15.521	0.000
Occupations in art, culture, recreation, and sport	-11.115	18.213	0.542

Sales and service occupations	70.852	14.082	0.000
Occupations in primary industry	-54.976	28.140	0.051
Occupations in processing, manufacturing, and utilities	-23.895	16.347	0.144
Agriculture, forestry, fishing, and hunting	-117.749	24.868	0.000
Mining, oil and gas extraction	248.937	32.170	0.000
Utilities	150.989	28.650	0.000
Construction	-27.758	17.908	0.121
Wholesale industry	18.237	13.649	0.182
Retail industry	-158.446	10.871	0.000
Transportation and storage	8.792	14.322	0.539
Information and cultural industries	90.039	14.819	0.000
Finance and insurance	56.553	11.676	0.000
Real estate	-50.971	18.459	0.006
Professional, scientific, and technical services	-26.073	11.809	0.027
Business management	321.004	58.248	0.000
Administration and support, waste management and remediation	-87.828	13.451	0.000
Education	-40.032	11.678	0.001
Healthcare and social assistance	-124.552	10.820	0.000
Arts, entertainment, and recreation	-159.371	18.613	0.000
Accommodation and food services	-190.738	12.595	0.000
Other services	-167.570	12.490	0.000
Public administration	86.255	11.509	0.000
Full time work	3390.731	13.038	0.000
Part time work	3148.695	13.482	0.000
Constant	-3249.890	194.250	0.000

Table B11: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 35-50, 2006

Obs.	691180		
R-squared	0.124		
Root MSE	2767.600		
	Coefficient	**Standard Error**	**P-value**
Age	2.475	15.186	0.871
Age squared	-0.029	0.178	0.869
High school diploma	33.139	12.746	0.009
College, trades, or some CEGEP	95.795	12.409	0.000
Bachelor's degree	308.408	14.742	0.000

Advanced degree	363.301	17.265	0.000
Immigrant status	-52.280	28.523	0.067
Years since immigration	1.308	0.863	0.129
Atlantic Canada	-118.011	13.639	0.000
Quebec	-97.095	8.864	0.000
Manitoba and Saskatchewan	-109.409	14.443	0.000
Alberta	3.627	11.711	0.757
British Columbia	-15.168	10.648	0.154
Management occupations	405.111	22.368	0.000
Business, finance, and admin	88.442	20.133	0.000
Healthcare	177.313	26.220	0.000
Occupations in social science, education, government, and religion	301.253	24.387	0.000
Occupations in art, culture, recreation, and sport	124.909	23.432	0.000
Sales and service occupations	8.328	28.169	0.767
Sales and service occupations	114.739	20.993	0.000
Trades, transport and equipment operators, and related occupations	-8.148	28.205	0.773
Occupations in primary industry	-75.412	43.785	0.085
Agriculture, forestry, fishing, and hunting	-161.156	39.875	0.000
Mining, oil and gas extraction	199.968	46.401	0.000
Utilities	277.235	47.686	0.000
Construction	-89.962	28.700	0.002
Wholesale industry	-4.107	22.332	0.854
Retail trade	-218.631	18.351	0.000
Transportation and storage	-26.700	24.223	0.270
Information and cultural industries	48.777	25.937	0.060
Finance and insurance	77.139	19.850	0.000
Real estate	-200.336	30.086	0.000
Professional, scientific, and technical services	-68.492	19.654	0.000
Business management	234.199	93.279	0.012
Administration, waste management, and remediation	-144.345	22.035	0.000
Education	-71.900	19.607	0.000
Healthcare and social assistance	-175.516	18.261	0.000
Arts, entertainment, and recreation	-160.149	30.705	0.000
Accommodation and food services	-239.965	21.305	0.000
Other services	-266.031	20.827	0.000
Public administration	31.690	19.594	0.106
Full time work	6621.180	22.041	0.000

Part time work	6315.527	22.834	0.000
Constant	-6041.944	321.831	0.000

Table B12: Regression Yielding Estimates of the Female Weekly Wage, Sample Aged 35-50, 2011

Obs.	778265		
R-squared	0.118		
Root MSE	1572.200		
	Coefficient	**Standard Error**	**P-value**
Age	7.790	8.085	0.335
Age squared	-0.061	0.095	0.522
High school diploma	-73.344	6.998	0.000
College, trades, or some CEGEP	-42.946	6.717	0.000
Bachelor's degree	192.397	7.630	0.000
Advanced degree	281.735	8.762	0.000
Immigrant status	-14.305	14.364	0.319
Years since immigration	2.342	0.428	0.000
Atlantic Canada	-132.094	7.374	0.000
Quebec	-88.977	4.756	0.000
Manitoba and Saskatchewan	-93.235	7.831	0.000
Alberta	30.963	6.184	0.000
British Columbia	-38.507	5.652	0.000
Management occupations	428.819	26.051	0.000
Business, finance, and administration occupations	66.171	25.906	0.011
Natural and applied sciences, and related occupations	307.339	27.531	0.000
Healthcare	370.013	26.911	0.000
Education, law and social sciences, community and government service	91.165	26.474	0.001
Occupations in art, culture, recreation, and sport	-178.501	28.502	0.000
Sales and service occupations	-36.849	26.054	0.157
Trades, transport and equipment operators, and related occupations	-75.204	29.418	0.011
Natural resources, agriculture, and related occupations	-142.724	28.394	0.000
Agriculture, forestry, fishing, and hunting	-454.729	21.454	0.000
Mining, oil and gas extraction	600.161	26.277	0.000
Utilities	419.961	27.123	0.000
Construction	-80.294	16.915	0.000

Wholesale industry	69.900	13.751	0.000
Retail industry	-279.867	11.340	0.000
Transportation and warehousing	-19.455	14.778	0.188
Information and cultural industries	159.717	16.018	0.000
Finance and insurance	154.987	12.152	0.000
Real estate	-201.626	17.696	0.000
Professional, scientific, and technical services	-68.105	11.933	0.000
Business management	77.485	60.181	0.198
Administration, waste management, and remediation	-241.293	13.587	0.000
Education	-11.132	12.003	0.354
Healthcare and social assistance	-219.819	11.261	0.000
Arts, entertainment, and recreation	-211.137	18.453	0.000
Accommodation and food services	-327.719	13.099	0.000
Other services	-347.295	12.859	0.000
Public administration	116.265	11.725	0.000
Full time work	1332.621	27.465	0.000
Part time work	995.813	27.852	0.000
Constant	-662.140	171.068	0.000

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