# The Effect of the Minimum Wages on Household Expenditure in Canada, 1998-2009

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Major Paper presented to the

Department of Economics of the University of Ottawa

In partial fulfillment of the requirement of the M.A. Degree

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ECO 6999

Ottawa, Ontario
December 2018

**Abstract**

Minimum wage increases have been increasingly popular as policy makers look to increase the incomes of lower and moderate-income working individuals. In this paper I estimate the impact of the minimum wage legislation on household expenditure using data from the Canadian Survey of Household Spending (1998-2009). I explore whether increases in the minimum wage affect household income, total expenditure and 12 categories of household spending. I first consider the full sample of households where the household head is under 30 years of age and not currently enrolled in school. Then I separate this sample into married and single households. For the full sample my estimates imply that a $1 increase in the minimum wage is associated with an increase in household income of 18.4% and an increase in total expenditure of 4.7%. Overall, increases in the minimum wage appear to be successful at improving the welfare of young households. However, the benefits are not borne by all households equally. After a $1 increase in the minimum wage, income in married households increases by 19.8%, as compared to single households where income decreases by 28.0%. Further, total expenditure increases by 5.1% for married households compared to an insignificant increase of 2.9% for single households.

## 1. Introduction

Every province and territory in Canada legislates a minimum wage rate.[1] The goal of this legislation is to protect non-unionized workers in unskilled jobs. There is of course a ripple effect whereby the legal minimum wage not only determines the compensation of these low skilled workers, but also those of high skilled workers. In order to maintain a hierarchy, firms will have to increase wages of higher skilled workers; otherwise the pay gap between high and low skill workers will fall as the minimum wage increases, therefore skewing motivation in the workplace. Employers may also raise wages for all workers in order to remain competitive in the labour market. While these wage increases should help limit turnover, they are costly to firms.[2]

Minimum wage increases have the largest impact on low skilled workers. Neumark, Schweitzer and Wascher (2004), explore this idea of how minimum wage increases affect high and low skilled workers. They find that initially low skilled workers earning close to the minimum wage have an increase in income. Slightly after the policy change, low skilled workers have their hours cut and their employment rate declines, while high skilled workers are not as affected.

Since 1998 there have been many changes in minimum wages. For the 10 provinces, there were a combined 91 minimum wage changes between 1998-2009. Ontario, Quebec and British Columbia had the fewest changes in the minimum wage, while the largest number of changes in the minimum wage was seen in Prince Edward Island and New Brunswick with 20 provincial minimum wage changes. Furthermore, in

[1] As in the U.S., Canada has a federal minimum wage rate that applies to only federal workers. While provinces and territories decide there own minimum wage rate that only applies to workers who live in that province or territory.

[2] This notion is seen in an article published in the Globe and Mail Mahboubi, P. (2018).

real terms, Alberta, Newfoundland and Labrador and Saskatchewan saw the largest real increase in minimum wages from 1998-2009 of $2.63, $2.48 and $2.30, respectively. Surprisingly some provinces have a real minimum wage decrease over the same period. British Columbia and Quebec have declines of $1.04 and $0.63, comparably. When provinces do not raise the minimum wage each year by at least the rate of inflation they will have a negative real minimum wage.[3]

Much of the existing literature has focused on the impact of changes in the minimum wage on employment, education and labour supply and demand (see for example Brochu and Green (2013), Brown (1999) and Card and Kruegar (1994)). Very little attention has been given to understanding the effect of minimum wage increases on household expenditure or household spending. This paper investigates the relationship between minimum wages and household expenditure by looking at changes in the adult minimum wage across the 10 provinces, 12 expenditure categories and total expenditure over the period of 1998-2009. This work also contributes to the literature on the determinants of household expenditure. To identity the effect of income on household expenditure, much of the expenditure literature uses exogenous variation arising from anticipated income changes through tax refund credits, social assistance or government transfers. In this paper I use provincial and time variation in minimum wage rates to examine changes in household expenditure.

Expenditure data came from the Survey of Household Spending (SHS) and minimum wage data from the minimum wage database.[4] This paper focuses on

[3] The inflation rate in Canada is benchmarked between 1-3%, but usually the Bank of Canada targets a 2% inflation rate.
[4] The Minimum wage database is located on the Government of Canada website. This can be accessed by http://srv116.services.gc.ca/dimt-wid/sm-mw/rpt2.aspx.

households who are married or single, where the household head is under 30 years of age and not currently enrolled as a student. I focus on these younger households, as they are more likely to earn wages at or around the minimum wage and therefore will be more affected by changes to the minimum wage rate. Similarly, I exclude current students because their main focus is not working and therefore changes in the minimum wage might affect them differently.

The results suggest that the effect of the minimum wage varies by household type. Married households benefit the most from increases in the minimum wage. For a $1 increase in the real minimum wage, household income among married households increases by 19.8%, and total household expenditure increases by 5.1%. When considering expenditure categories separately, I find statistically significant increases in expenditure associated with shelter, pension and clothing for males and statistically significant decreases in expenditure for alcohol purchases from liquor stores. These results suggest that married households are substituting away from discretionary goods such as alcohol for essential goods like shelter or pension. Single households do not fare as well. These households experience an income decline of 28.0% for a $1 increase in the minimum wage. Overall there is no statistically significant change in total household expenditure, but when expenditure categories are considered separately, meaningful declines in charitable contributions and pension spending are found. These declines are countered by a significant increase in expenditure on shelter.

Robustness checks were done to assess the sensitivity of the results to different model assumptions. Information on educational attainment is only available for the later years (2004-2009). I use this later subsample to further restrict the data to households

where the household head has at most a high school diploma, where those individuals are more likely to be earning wages close to the minimum wage, and thus more likely to be affected by the policy changes. Although most of the results were insignificant for both married and single households, a $1 increase in the minimum wage is associated with an increase in income for married households by 13.8%, with an increase in total expenditures by 3.3%. Similarly, single households experienced a statistically insignificant decline in household income by 29.7% and an increase in total expenditures by 1.4% for a $1 increase in minimum wage. These results are consistent with the original model where households were not restricted by education.

The rest of the remaining sections include the literature review next, with Section 3 describing the data and summary statistics, Section 4 presents the empirical methods, Section 5 explains the results, Section 6 discusses the robustness checks and Section 7 is the conclusion.

## 2. Literature Review

This literature review is separated into three sections: Canadian, American and International literature. I first discuss the literatures that examine how the minimum wage affects other outcome such as the unemployment rate. Further I discuss the few papers about the minimum wages and the effects it has on household expenditure.

### *2.1 Canadian Literature*

Brochu and Green (2013) look at the effect of minimum wages on labour market transitions using the Canadian Labour Force Survey for the years 1979-2008. They focus on the difference in the transition rates in high minimum wage regimes versus low

minimum wage regimes. They find that for every 10% increase in the minimum wage, the layoff rate falls by 3.9%. Furthermore, higher minimum wage rates are associated with lower hiring rates and lower job separation rates. This result is similar to Baker, Benjamin and Stanger (1999), who find that the employment rate for Canadian teenagers declines by 2.5%, for every 10% increase in the minimum wage. The results from Brochu and Green (2013) and Baker, Benjamin and Stanger (1999) explain how increases in the minimum wage affect the labour force negatively for younger lower skilled workers. Their results could explain why younger households are more affected when minimum wage changes occur, resulting in a decline in household expenditure.

Campolieti, Fang and Gunderson (2005) use the 1993-1999 master files of the survey of Labour and Income Dynamics (SLID) to investigate transitions from employment to non-employment for individuals affected by minimum wage changes.[5] The data is restricted to teens and young adults (16-24 years old). They look at the ten provinces, as the territories are missing significant variables, and find that minimum wage increases result in youths transitioning from employment to unemployment. They also find a displacement effect, the percent of workers that involuntarily transition from employment to unemployment, of 6%, which is attributed to minimum wage elasticities of -0.40, which range from -0.30 to -0.50 over the years studied.

Norris and Pendakur (2015) use the Survey of Household Spending (SHS) for 1997-2009 to examine consumption inequality in Canada. To measure consumption inequality in Canada they use a Gini coefficient. If the Gini coefficient is close to zero then there is equality across all households and individuals. The authors find that this coefficient is increasing for household consumption from 0.251 to 0.275 for 1997-2006,

[5] Throughout the 1990s in Canada there were 24 changes to the minimum wage in different provinces.

making household consumption less equal across Canada. Furthermore this Gini coefficient was broken down by the individual level rather than the household level. They estimated a similar increase from 1997 to 2006, which shows the coefficient going from 0.199 to 0.216. Household and individual income had comparable increases in their Gini coefficients, which led to the conclusion that consumption and income inequality followed similar paths.

*2.2 American Literature*

Aaronson, Agarwal and French (2012) explore the impact that minimum wage rate hikes have on household income and spending using the Consumer Expenditure Survey (CEX), Survey of Income Program Participation (SIPP), Current Population Survey (CPS) and administrative bank and credit data. The magnitude of a $1 wage hike is associated with an increase in household income by $250 and an increase in household spending by $700 per quarter. Their identification is a difference-in-difference that comes from comparing households with minimum wage workers in states that are exposed to a minimum wage hike and households in states that are not exposed to such hikes. They find that a $1 wage hike has an immediate effect, increasing income by $250, and a one year lagged effect on spending of $700. They also find no effect of minimum wage hikes on income or spending of a household for those who make double the minimum wage rate.

Through the use of federal and state level minimum wage data from the Department of Labor as well as Nielsen data for household consumption of nondurable goods, Alonso (2016) was able to examine the effect of the minimum wage on the consumption of nondurable goods. In this paper, nondurables are defined as retail sales

and grocery purchases measured by Nielsen data. Nielsen is a marketing analytics company that tracks household credit cards in order to determine what products and goods people are purchasing. This paper examines whether increasing the minimum wage could increase consumption based on redistribution of income from rich households with low marginal propensity to consume income to poor households with a high marginal propensity to consume income. At the aggregate level, a 10% increase in the minimum wage was found to lead to a 1.1% increase in nominal sales and a 0.7% increase in real sales. In addition, he argues that the effect is caused by spillovers that benefit the bottom percentile of the labour income distribution. Minimum wage spillovers refer to low skilled workers who earn slightly more then the minimum wage rate. The spillover effect means that after a minimum wage increase these workers who are earning just above the minimum wage are likely to receive a wage increase as well.

Parker, Souleles, Johnson and McClelland (2011) investigate how household spending responds to the economic stimulus payments (ESPs) of 2008. During this time period the U.S. economic system was disrupted by the financial crisis and the ESPs were a fiscal policy stimulus developed to induce household spending. Single households received $300-$600, couples received $600-$1200 and every household received an additional $300 per child that qualified under the child tax credit. Working with the U.S Bureau of Labour Statistics they were able to add additional questions about transfer payments to the existing Consumer Expenditure Survey (CEX). They found that households who receive these transfers spend approximately 12-30% of their stimulus payments on non-durable goods. Surprisingly there was a larger increase in average

durable goods especially in vehicle purchases, which increased the spending of their stimulus payment to 50-90%.

Agarwal, Liu and Souleles (2007) use a new panel data set of credit card account information to evaluate how household expenditure responded to federal income tax rebates in 2001. In 2001 two thirds of U.S. tax filers got a rebate of $600 (couples) or $300 (singles), which led to a total of $38 billion in rebates. They found that initially households save some of the rebate by increasing their credit card payments and paying down debt, which resulted in higher liquidity. They also found a significant increase in household spending by $200 over the nine months after getting the rebate. This result is more in line with Aaronson, Agarwal and French (2012) as they found similar results. Both studies examine the impact of government transfers as an increase in household income and the effect they have on household expenditure. They find that these government transfers in the United States in fact lead to higher household expenditures.

Coulibaly and Li (2006) use the maturity date of a mortgage to estimate how expenditure changes one month after the last mortgage payment is paid. Assuming that households maximize utility and that there are perfect credit markets, consumers are expected to follow the permanent income hypothesis model. If they expect an increase in income in the next period (one month after last mortgage payment), they will borrow to smooth expenditure to the next period. The Consumer Expenditure Survey (CEX) is used to track consumer expenditure patterns, which includes mortgage data.[6] Their results remain consistent with literature and indicate that for every $1 increase in disposable income, there will be an increase in spending on home furnishings and entertainment by

[6] The mortgage data included in the CEX includes, mortgage interest rate, mortgage length, the origination date of the mortgage and the initial principle amount. The author's uses these variables to identify the maturity date of the mortgage that is essential for the outcome of this paper.

$0.20 and $0.04, respectively. Savings were also examined; an increase of $1,068 in annual income on average leads to an increase in annual savings of $482.

Federal and state tax rebates are used by the U.S. governments to increase household income for those households around the poverty line. Similarly to Aaronson, Agarwal and French (2012) and Agarwal, Liu and Souleles (2007), Hsieh (2003) explores the Permanent Fund legislation in Alaska.[7] This fund provides large amounts of money for their residents.[8] The author looks at these payments over periods of time for all different family sizes to examine the effect the payments have on expenditure. The size of these payments varied from $331 in 1984 to $1,964 in 2000. The Consumer Expenditure Survey (CEX) was used for the years of 1980 to 2001. The author finds no evidence that the Permanent Fund payments affect expenditure for Alaska residents. This finding is consistent with theory that households take into account these large changes in income and they will already be imbedded into their expenditure tendencies. When payments are large, commonly received and easy to foresee, expenditure will not change radically.[9]

*2.3 International Literature*

Exploring the consumption response to minimum wage changes in China, Dautovic, Hau and Huang (2017) use data from the Chinese Ministry of Human Resources and China Urban Household Survey for 1999-2012. Unlike the other papers discussed above, this paper separates households based on how dependent they are on the

[7] The Permanent Fund legislation that was passed in 1976 mandates deposits of 25% of the state's oil royalties into a 'trust fund'.
[8] In 1998, the fund paid $1,541 to everyone who lived in Alaska for 12 months.
[9] Households expect these payments every year as long as they abide by the rules set by legislation. Alaska has made it particularly easy for residents to sign up for this fund.

minimum wage; households who earn at least 25%, at least 50% or at least 75% of the household income from the minimum wage. They find that lower income families will spend the entire additional income received from the increase in the minimum wage. Furthermore they also find that a large share of the low income households spend a sizable proportion more on education and healthcare, than other households.

Using Spanish panel data, the Encuesta Continua de Presupuestos Familiares (ECPF), Browning and Collado (2001) look to predict expenditures after households receive a bonus payment. The bonus payments are received by some full time workers, usually at the end of June and in mid-December. The sample is restricted to married households that have the husband employed full time and an unemployed wife. The results show that there is no effect of anticipated changes in income on expenditure patterns in the same year as the bonus is received.

Nguyen (2013) takes a different approach and looks at the effect that minimum wage increases have on employment, wages and expenditures of low wage workers in Vietnam. The author divides the labour force into formal and informal sector workers. Formal sector workers are those who work for the State or a private enterprise, while informal workers are those who work for a household, who typically do not have a contract and usually collect social assistance. The data sets that is used is the Vietnam Household Living Standards Survey (VHLS).[10] The expenditures were broken down into food and non-food categories.[11] Income was separated into agriculture and non-

[10] The General Statistical Office of Vietnam (GSO) collects the Vietnam Household Living Standards Survey with support from the World Bank (WB) for 2004 and 2006.
[11] The food expenditure is comprised of purchased food, 'foodstuff' and self produced products, while non food expenditures include; education, healthcare and household costs like power, water and garbage disposal.

agriculture. [12] The author finds that minimum wage increases diminish employment of low wage workers in the formal sector and those agents who lost their jobs were unable to find employment in the informal sector. Furthermore there is no significant effect on expenditure and wages for low wage employees when the minimum wage is increased.

These studies above discuss the importance of the effect of minimum wage on household expenditures and labour supply and demand. There is a lack of papers that thoroughly examine the overall impact on household expenditures; rather, the literature looks at aspects of household spending such as durable and nondurable goods at the aggregate level. This paper examines the effect of a minimum wage change on total household expenditure and 12 expenditure categories.

## 3. Data

### *3.1 Survey of Household Spending*

In order to examine household spending, expenditure data are drawn from the public use files of the Survey of Household Spending (SHS) for the years 1998-2009.[13] Formerly known as the Family Expenditure Survey (FAMEX), the SHS contains information on several expenditure categories along with household characteristics of the reference person and their spouse.[14] The SHS is conducted annually and surveys approximately 15,000 households. The survey collects information about each household for the reference year of the survey, and contains rich data on dwellings, characteristics of

[12] Non-agriculture income includes salary, wages, pensions, scholarships and social transfers. Agriculture income includes crop income, livestock income, aquaculture income and income from other related activities.

[13] The Government of Canada has restricted access to the dataset for 2010 and onward. The available data after 2010 only contains averages of each expenditure category and very few household characteristics.

[14] The FAMEX was discontinued in 1996 and combined with the Household Facility and Equipment Survey to form what is now the Survey of Household Spending.

the reference person and their spouse, household description, household expenditures and household income.

The sample restrictions are similar in nature to those imposed in Norris and Pendakur (2015). Households living in the 10 provinces were used as the SHS combines the three territories together. This is problematic for linking expenditure data with minimum wage data that varies by territory. Households with the household head over the age of 30 were excluded. This restriction was imposed because households who are under 30 are more likely to be at the minimum wage than older households. I restrict the full sample to households where the household head is not currently enrolled in school. This restriction was imposed because the main focus of a student is not working, therefore the minimum wage could affect them differently. Further, as a robustness check, the SHS added educational attainment into the survey in 2004, which allows me to restrict for educational attainment of high school or below for the household head for the years 2004-2009. Restricting educational attainment to high school level or below for the household head will allow me to examine households that could be most affected by changes in the minimum wage because the literature shows that lower educated individuals earn less income. [15] [16]

The first set of dependent variables (expenditures categories) were chosen to be similar to Norris and Pendakur (2015). There are 12 expenditure categories that are explored as well as a total expenditure category. Food expenditure is broken into food bought at grocery stores versus at a restaurant. Shelter is a combination of rent paid,

[15] This is similar to what Boudarbat, Lemieux and Riddell (2010) found in their study.
[16] For the married sample, if either the reference person or the spouse answered 'yes' to having an education of high school or below then they were included in the sample. For the singles, this question was only asked to the reference person, as they do not have a spouse.

property tax and mortgage payments. Clothing is separated into male and female expenditure categories. The clothing category is defined as any clothing bought for the household or clothing bought as gifts for individuals outside the household. Transportation expenditure is divided into public transportation and gasoline/fuel expenditure for the household's vehicles only. Charitable contributions include any money donated to charities, while pension plan contributions consist of the amount of money saved in the households' retirement fund or paid to a pension plan. Alcohol is divided into purchases from a liquor store and purchases from a licensed vendor. Tobacco is spending on cigarettes/cigars/tobacco and tobacco accessories. Lastly the total expenditure category is the sum of the 12 expenditures listed above only. All of the expenditures are deflated to the year 2017 using Canadian CPI data from CANSIM.[17]

Income and government transfers are additional dependent variables used to see the effect that increases in the minimum wage have on those two income categories. Household income is only based on hourly wages, net of social assistance or supplemental income. Government transfers are comprised of Employment Insurance Benefits, Child Tax benefits and Provincial Income Supplements.

The variation in average spending for province and year can be seen in Figure 1 to Figure 3. Figure 1 shows the average total expenditure across the years 1998-2009. The figure illustrates plenty of variation between provinces and years, with the highest levels of household spending in British Columbia, Alberta and Ontario. Figure 2 displays the average total shelter cost. Similar to Figure 1, the largest household spending for this category comes from British Columbia, Alberta and Ontario. The lowest household

[17] The CANSIM number for the CPI data is 326-0020.

spending on shelter cost is seen in Newfoundland and Labrador and New Brunswick, which show modest changes over time. Finally, Figure 3 shows the average food expenditure. There is lots of variation throughout the years for all provinces. Unlike Figures 1 and 2, food expenditure for all provinces seems to move in a similar direction for all the years.

My model includes the following control variables for socio economic factors: a variable for the age of the reference person, a dummy variable for living in rural locations, martial status and a dummy variable for the gender of the reference person.[18] Provincial and year fixed effects are also included in the model.

*3.2 Minimum Wage Data*

The monthly provincial minimum wage data set spans the period 1998-2009. This data was collected from the minimum wage database located on the Government of Canada website. The CPI was used to deflate the data using the nominal wage rate for that current year. The minimum wage data is deflated to the year 2017. While technically the minimum wage rate differs across industries (i.e., in the food industry servers may face a lower minimum wage rate because they receive gratuity for their service), for this paper I only use the adult minimum wage for each province.[19] Figures 4 to 6 show the change in the real minimum wage for each province for the years of 1998-2009. The figures are grouped together by geography; western provinces are seen in Figure 4, which includes British Columbia, Alberta, Saskatchewan and Manitoba. Alberta, Saskatchewan

[18] The SHS defines a rural area as having a population of fewer than 30,000 people.
[19] Alberta, Saskatchewan, Manitoba, New Brunswick, Prince Edward Island and Newfoundland & Labrador all have a standard adult minimum wage. British Columbia has a standard adult minimum wage and a wage for liquor servers. Ontario has a general workers wage, a liquor servers wage and a student wage if the individual is under 18 years old. Quebec has a standard wage, as well as a wage if gratuity applies. Finally, Nova Scotia has a wage rate for experienced workers and one for inexperienced workers.

and Manitoba follow similar paths which trend upwards over time, while British Columbia follows an opposite downward trend. Figure 5 is just Ontario and Quebec, which follow downward trends. However, since 2008 Ontario has increased its minimum wage drastically, while Quebec's real minimum wage rate continues to decline. Finally, Figure 6 is the eastern provinces of Newfoundland and Labrador, Nova Scotia, Prince Edward Island and New Brunswick. All of these provinces have an upward trend in real the minimum wage, with large increases occurring in the later years.

*3.3 Price Data*

Price level data comes from CANSIM and uses the base year as 2002. The commodity base level consumer price indices (CPI) are available for each province and year. I use national level CPI to deflate the minimum wages, expenditure categories, income and government transfers to 2017. As mentioned above I use these values to deflate the various measures of expenditure, household income, government transfers and minimum wage data into terms that can be consistently compared across 1998-2009. In order to deflate the variables listed above data I use 4 equations:

$$\text{Minimum Wage Deflator} = \left[\frac{\left(MW_{i,p}\right)}{\left(CPI_i\right)}\right] \times \left(CPI_{2017}\right) \tag{1}$$

$$\text{Expenditure Deflator} = \left[\frac{\left(EXP_{i,p}\right)}{\left(CPI_i\right)}\right] \times \left(CPI_{2017}\right) \tag{2}$$

$$\text{Income Deflator} = \left[\frac{\left(Income_{i,p}\right)}{\left(CPI_i\right)}\right] \times \left(CPI_{2017}\right) \tag{3}$$

$$\text{Government Transfers Deflator} = \left[\frac{\left(GT_{i,p}\right)}{\left(CPI_{i}\right)}\right] \times \left(CPI_{2017}\right) \quad (4)$$

*3.4 Summary Statistics*

Table 1 and 2 report the weighted summary statistics after all the restrictions are imposed on the sample. Table 1 shows the full sample contains 8,479 observations with approximately 61% being married and 39% being single. Of household heads, 41% are males and 59% are females. Seventy percent of married and 72% of single households live in Ontario, Quebec or British Columbia, and these proportions are consistent in both male and female sub-samples. Seventy five to eighty percent of the married and single households are between the ages 25-29 years old, while 76%-79% of the males and females are between the ages 25-29 years old. Table 2 reports the weighted summary statistics for the expenditure categories, income and government transfers. Average income for the full sample is $58,895.61 with married households earning $73,103.81 compared to single households that earn $36,497.79 annually. Males and females have approximately the same average income, $59,895.05 and $58,031.69, respectively. In terms of expenditure, the largest expenditure category is shelter cost, on average $13,090.55 for the full sample. Married households spend approximately $4,000 more on shelter costs compared to singles, while female-led households spend approximately $1,000 more on shelter costs compared to male-led households.

## 4. Econometric Model

In order to obtain an unbiased estimate of the causal effect of the minimum wage on household expenditure, the following model was used:

$$HHC_{i,p,t} = \beta_0 + \beta_1 X_{i,p,t} + \beta_2 MW_{p,t} + \delta_p + \phi_t + \mu_{i,p,t} \quad (5)$$

where HHC is the natural log of household expenditure with the subscripts 'i', 'p' and 't', for the household, province and year, respectively. $X_{i,p,t}$ is a vector of socio-economic characteristics. It includes gender, age, location of the household and whether the individual is married or single. $MW_{p,t}$ is the real minimum wage which is for each year and province. $\delta_p$ and $\phi_t$ are the province and year fixed effects respectively. The last variable is the residual, $u_{i,p,t}$.

The following equations were used to examine the effect of the minimum wage on household income and household government transfers.

$$HHI_{i,p,t} = \beta_0 + \beta_1 X_{i,p,t} + \beta_2 MW_{p,t} + \delta_p + \phi_t + \mu_{i,p,t} \quad (6)$$

$$HHGT_{i,p,t} = \beta_0 + \beta_1 X_{i,p,t} + \beta_2 MW_{p,t} + \delta_p + \phi_t + \mu_{i,p,t} \quad (7)$$

The independent variables in equation (6) and (7) are the same as in equation (5). The dependent variables are now the natural logarithms of household income and household government transfers, respectively. These equations estimate the effect of a $1 change in the minimum wage on household income and household government transfers. Income and government transfers were not included as independent variables in equation (5) because I want to see the effect that the minimum wage has on these variables. Furthermore, since the minimum wage may affect both household income and household government transfers, these variables are not suitable to be independent variables in equation (5).

Provincial fixed effects take into account any time-invariant provincial level differences in expenditure, while year fixed effects takes into account any secular trends in expenditure across all provinces.

Formally known as a difference-in-differences, the identification comes from comparing household expenditures and changes in provincial minimum wages. In the difference-in-differences methodology, the first difference will come from the time control, which will look at pre-minimum and post-minimum wage changes while the second difference will look at the change per province. In other words, the model compares changes in household expenditure for provinces where the minimum wage changes to the changes in household expenditure for the provinces where the minimum wage does not change. The intuition underlying the difference-in-differences estimator can be understood using a simple equation with two time periods (t=1,2) and two provinces (p=1,2). Suppose that province 1 experiences a minimum wage increase between periods 1 and 2, while province 2 does not experience a minimum wage change. In this simple example, the difference-in-differences estimator is:

$$\psi_1 = \left(HHC_{2,1} - HHC_{1,1}\right) - \left(HHC_{2,2} - HHC_{1,2}\right)$$

where the first difference is the change in the average expenditure of households in province 1 between periods 1 and 2, while the second difference is the average change in expenditures in province 2.

The difference-in-differences estimate of the casual effect of the minimum wage will be biased if the parallel trends assumption does not hold. This parallel trends assumption states that, in the absence of the minimum wage changes, the evolution of household expenditures in provinces with minimum wage changes would have followed the same trend as household expenditures in provinces without a minimum wage change. In other words, any pre-existing differences in the household expenditure between

provinces with and without minimum wage changes remain constant following minimum wage changes.

## 5. Results

### *5.1 Household Income and Government Transfers*

I first examine whether minimum wage changes affect household income and government transfers. Table 3 to 5 report the weighted OLS regression results of the minimum wage variable from 15 different equations (one for each dependent variable). Table 3 shows the OLS regression results when household income and government transfers are the dependent variables using equation (6) and (7) for the full sample, married and single households. The estimate of the effect of the minimum wage on household income is not statistically significant for the full sample. For the married sample a $1 increase in minimum wage is associated with a significant increase in household income of 19.8%. However, with the same $1 increase in minimum wage, single households experience a significant decline in household income by 28.0%. This suggests that married households are made better off while single households are negatively affected by this policy change. With large declines in the household income of singles, this suggests there is an employment effect that causes these households to be laid off or have the number of hours they work diminished. Table 4 reports weighted estimates of equation (6) for male and female households separately. Although the results are statistically insignificant, single males and females experience similar declines in household income.[20] In a recent paper, Aaronson & Phelan (2016) explore the idea of

[20] Table 4 shows that single males have a decline of 19.5% compared to single females have a decline of 27.6%.

low wage workers and the effect technology has on their employment rate. This may also be causing the large decline in income as firms substitute away from low skilled workers by implementing technology to replace their roles. Aaronson an Phelan (2016) find that a 10% increase in the minimum wage leads to a 1.5% decline in the employment rate of low skilled workers. The decline in the employment rate of low skilled workers is consistent with the finding of a large income decline in my results for single households. This suggests that there is a possibility that single households are more likely to be low skilled workers while married households are more likely to be higher skilled workers.

Table 3 also shows the results of equation (7), where government transfers are examined when there is a $1 increase in minimum wage. While all estimates are statistically insignificant, column 2 shows that a $1 increase in the minimum wage is associated with a 25.1% decline in government transfers for married households and a 26.0% increase in government transfers for single households.[21]

To conclude, married households gain from a $1 increase in the minimum wage as household income increases with an insignificant decline in government transfers, compared to single households that experience a decline in household income with an insignificant increase in government transfers.

*5.2 Household Expenditure*

Table 3 (rows 3-15) reports the estimates of the effect of the minimum wage on the expenditure categories for the full sample, married and single households. The full sample has a statistically significant increase of 4.7% in total expenditure when the real

[21] Results for the single male and female households can be seen in Table 4. The results are similar to the full single sample. Single males experience an increase in government transfers by 20.9% compared to single females experiencing an increase of 20.5%. The results are statistically significant.

minimum wage increases by $1. This expenditure increase is comprised of mainly shelter costs increasing by 18.4% with declines in alcohol purchases and charitable contributions.[22] Married households saw the largest increase in household expenditure in comparison to the other samples. Table 3 shows that married households experience an increase of 5.1% in household expenditures when minimum wages are increased by $1, which is significant at the 1% level. The increase in expenditure is caused by the following significant categories: male clothing expenditure, pension, and shelter costs, with significant declines in alcohol purchases from liquor stores. For married households, a $1 increase in the minimum wage is associated with an 11.1% increase in male clothing expenditures, a 22.1% increase in pension contributions, a 15.6% increase in expenditures on shelter costs and a 2.0% decline in expenditures at liquor stores.[23]

However, single households are made worse off when there is an increase in the real minimum wage. Table 3 shows the estimates of the effect of a $1 increase in the minimum wage on household expenditure. In response to the minimum wage, single households experience a statistically insignificant 2.9% increase in total expenditure. Furthermore, the effects on the expenditure categories for these households are almost all negative in value. The significant changes in household expenditure are seen in charitable contributions and total shelter costs. A $1 increase in the real minimum wage is

[22] Supplemental regressions were run to explain the large spike in shelter cost. Restricting the sample to only homeowners there is still a 19.4% increase in shelter cost, while when restricting for only renters there is a 17.2% increase, both significant at 1%.

[23] Similar to the full sample, shelter cost has a large positive increase. Restricting the sample to only homeowners there is a 15.4% increase in shelter cost with significance level of 10%, while when restricting for only renters there is a 16.9% increase with a significant level of 1%.

associated with a 19.8% increase in expenditures on shelter and a 29.1% decrease in charitable contributions.[24]

I also split the sample of single households into male and female households to further examine if the effect of minimum wage on household expenditure has consistent results based on gender. Table 4 reports the regression results for male and female single households. Although the results for the majority of the expenditure categories are statistically insignificant, the signs of the coefficients are what are most interesting. When there is a $1 increase in the minimum wage, single males have a significant increase to total expenditure of 21.1% while single females have an insignificant increase of 3.6%. Single males have a combination of positive and negative coefficients, which differ from the single female households, whose coefficients are mostly negative. These results may suggest that single males gain more from minimum wage increases than single females. When the minimum wage increases by $1, expenditures on food from restaurants declines by 16.0%, charity decreases by 38.7% and pension contributions fall by 25.5%, whereas there is an increase in shelter costs of 20.7%.[25] Single females experience statistically significant declines in women's clothing and charity expenditures, with a statistically significant increase on tobacco and shelter costs. When there is an increase in the minimum wage of $1 there is a decrease in women's clothing of 18.4% and charity of 24.9%. Expenditures on tobacco increase by 40.9%, while expenditures on shelter increase by 20.9%

[24] Decomposing shelter cost into homeowners and renters yield results similar to the total shelter cost result. Homeowners are faced with a 15.5% increase with a significant of 1% while renters see a 17.7% increase with a 5% significance level when minimum wage increases by $1.
[25] All results are statistically significant.

To summarize, when there is a real minimum wage increase married households are made better off with the greater part of the expenditure being allocated to shelter cost. Single households see a large decline in income and similarly, a large increase in shelter costs. When dividing up the single households by gender, similar results are found, but females experience more of a shortfall than males as the majority of the expenditure categories for the females experience decreases.

## 6. Robustness Checks

The Survey of Household Spending has data on the respondent's educational attainment for the years of 2004-2009 only. Looking at these years there is reason to believe that households who have lower education are more likely to be effected by minimum wage changes. Lower educational attainment will increase the likelihood that the individual is earning a wage close to the minimum wage. In Tables 5 and 6, I further restrict the sample to household heads whose education is at the high school level or below (for 2004-2009).[26] The estimated effect of the minimum wage is found to be insignificant in most cases.

### *6.1 Household Income with Education Restriction*

Table 5 shows the weighted effect of a $1 increase in the minimum wage on income and government transfers for the full sample, married and single households with a high school diploma or less. These results are insignificant but there are some changes to the direction of the coefficients compared to the baseline sample. For the full sample, the impact of a $1 increase in the minimum wage is associated with a decline in

[26] After the education restriction was implemented, the sample size became 1,985, as seen in Table 5.

household income of 17.1%. Married households income has a statistically insignificant increase of 13.8% while single households income has a statistically insignificant decrease of 29.7%. Looking more closely, Table 6 shows single male and female households. Income for single males increases by 49.4% with government transfers declining by 36.2%. However, single females experience a 51.6% decline in income with an increase in government transfers of 14.0%; the estimates for both single male and female households are statistically insignificant. These changes in the signs of the coefficient could be explained by the notion that as the minimum wage increases, households with lower education are more likely to be earning wages close to the minimum wage. Firms are faced with higher employment costs and may substitute low skilled workers for high skilled workers by laying off the lower skilled workers.

*6.2 Household Expenditure with Education Restriction*

The expenditure categories experienced similar changes when restricting the education of the household head to high school and below. Table 5 shows the expenditure categories for the full sample, married and single households. A $1 increase in the minimum wage is associated with an insignificant increase in total expenditure of 0.28% for the full sample, an increase of 3.27% for married households and an increase of 1.4% for single households. For the full sample, charitable contributions is the only expenditure category with a significant minimum wage coefficient. Table 5 shows that a $1 increase in the minimum wage is associated with a decline in charitable contributions of 35.1%. All of the other results for the full sample are statistically insignificant. Married households have insignificant increases in all categories besides alcohol purchases, while single households' expenditure declines in charitable contributions and increases in

shelter expenditure. This is consistent with the belief that minimum wage increases favour married households over single households.

Table 6 shows the weighted regression results for the single male and female household expenditure. Single males experience an insignificant increase in total expenditure of 7.3%, compared to a decline in total expenditure by 1.4% for single females. Single males have significant increases in alcohol purchases from restaurants and charitable contributions. For a $1 increase in minimum wage, alcohol purchases from restaurants increase by 84.4% whereas charitable contributions decrease by 62.8%. The remaining expenditure categories are both positive and negative. Comparing these results to single females, the expenditure categories are mostly negative. The significant results are seen in a decline of spending on women's clothing and alcohol purchased from liquor stores.

When the educational attainment of the household head is restricted for these years, the results show that married households with lower education are still better off than single households with low education. Households consisting of single males are better off than single females, shown by Table 6. Single males have both positive and negative expenditure categories with a positive total expenditure coefficient, while females have a negative coefficient for a large portion of their expenditure categories. To conclude, the education restriction supports the main findings of the paper that married households benefit more than single households when the minimum wage is increased. Similar arguments can be made that single male households are more positively affect than single female households.

## 7. Conclusion

This paper explores the effect of minimum wages on household expenditure for Canadian households. The existing literature in Canada focuses on minimum wage changes and the effect on employment, education, labour supply and labour demand. This paper looks at the effect of the minimum wage on household expenditure. This topic has not been thoroughly explored in Canada, as it has in other countries such as the United States and China.

I explore the notion of an anticipated income change and how it will affect households spending for the full sample, married and single households. Canadian data for the minimum wage was collected from the Government of Canada website, while household expenditure data came from the Survey of Household Spending for the years of 1998-2009. This data allow me to look at the effect of minimum wages on household expenditure for households whose household head is under the age of 30 and who is not currently enrolled as a student. For the years 2004-2009, education was made available. For these years only, supplemental regressions were run, where further restrictions were made by restricting the sample further for household heads that had an education level of high school or below.

Using a difference-in-differences methodology, I have three main findings. For a $1 increase in the minimum wage the full sample received an increase in household income and total expenditure of 18.4% and 4.7%, respectively. Married households facing the same increase in the minimum wage experience an increase to household income and total expenditure of 19.8% and 5.1%, respectively. Meanwhile, single households experience a decrease in household income of 28.0% and an insignificant

increase in total expenditure of 2.9%. The results were also divided up by gender for the single households. Female households were especially made worse off compared to male households, although the estimates were statistically insignificant; almost all the expenditure categories and household income had negative coefficients. To conclude, married households benefitted more, on average, compared to single households when experiencing a $1 increase in the minimum wage.

# Appendix

OLS regression results for total households

| Explanatory Variables | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) | (11) | (12) | (13) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Minimum Wage | 0.0467*** | 0.0065 | -0.0059 | -0.0032 | 0.0101 | 0.0621 | -0.0251 | 0.0204 | -0.157* | -0.128* | -0.182** | 0.029 | 0.184*** |
| | (0.013) | (0.018) | (0.044) | (0.073) | (0.069) | (0.095) | (0.084) | (0.111) | (0.090) | (0.076) | (0.082) | (0.072) | (0.042) |
| Rural | -0.0757*** | 0.127*** | -0.202*** | -0.00322 | 0.408*** | 1.279*** | -2.126*** | 0.106 | -0.523*** | 0.0427 | 0.138* | 0.245*** | -0.750*** |
| | (0.013) | (0.017) | (0.045) | (0.065) | (0.062) | (0.085) | (0.094) | (0.120) | (0.093) | (0.081) | (0.084) | (0.070) | (0.061) |
| Less then 25 | -0.255*** | -0.234*** | -0.336*** | -0.444*** | -0.728*** | -1.439*** | 0.121 | 0.921*** | -0.220*** | -0.326*** | -1.141*** | -1.174*** | 0.270*** |
| | (0.011) | (0.014) | (0.038) | (0.059) | (0.062) | (0.085) | (0.074) | (0.096) | (0.077) | (0.067) | (0.066) | (0.065) | (0.037) |
| Constant | 10.400*** | 9.136*** | 7.156*** | 7.456*** | 6.593*** | 5.094*** | 4.977*** | 3.986*** | 4.750*** | 5.996*** | 5.304*** | 5.692*** | 8.180*** |
| | (0.105) | (0.144) | (0.343) | (0.569) | (0.543) | (0.752) | (0.673) | (0.878) | (0.709) | (0.606) | (0.647) | (0.571) | (0.343) |
| Province Fixed Effects | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES | YES |
| Observations | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 | 8,479 |

Notes: Dependent variables are the 13 expenditure categories. All regressions are estimated using OLS with standard errors in brackets. All regressions are weighted. *is 10% significance. **is 5% significance. ***is 1% significance.

**References**


Aaronson, D., Agarwal, S., & French, E. (2012): "The Spending and Debt Response to Minimum Wage Hikes", *The American Economic Review, 102*(7), 3111-3139.

Aaronson, D., & Phelan, B. J. (2016): "Wage Shocks and the Technological Substitution of Low-Wage Jobs", SSRN Electronic Journal.

Agarwal, S., Liu, C., & Souleles, N. (2007): "The Reaction of Consumer Spending and Debt to Tax Rebates -- Evidence from Consumer Credit Data", *The University of Chicago Press,115*(6), 986-1019.

Alonso, C. (2016): "Beyond Labor Market Outcomes: The Impact of the Minimum Wage on Nondurable Consumption", SSRN Electronic Journal.

Baker, M., Benjamin, D., & Stanger, S. (1999): "The Highs and Lows of the Minimum Wage Effect: A Time-Series Cross-Section Study of the Canadian Law", *Journal of Labor Economics*, 17(2), 318-350.

Brochu, P., & Green, D. A. (2013): "The Impact of Minimum Wages on Labour Market Transitions", *The Economic Journal*, 123(573), 1203-1235.

Brown, C. (1999): "Chapter 32 Minimum wages, employment, and the distribution of income", *Handbook of Labor Economics*, 2101-2163.

Browning, M., & Collado, M. (2001): "The Response of Expenditures to Anticipated Income Changes: Panel Data Estimates", *The American Economic Review*, 91(3), 681-692.

Boudarbat, B., Lemieux, T., & Riddell, W. C. (2010): "The Evolution of the Returns to Human Capital in Canada, 1980–2005", *Canadian Public Policy*,36(1), 63-89.

Campolieti, M., Fang, T., & Gunderson, M. (2005): "Minimum wage impacts on youth employment transitions, 1993-1999", *Canadian Journal of Economics, 38*(1), 81-104.

Card, D., & Krueger, A. (1994): "Minimum Wages and Employment: A Case Study of the Fast Food Industry in New Jersey and Pennsylvania", *American Economic Association, 90*(5), 1397-1420.

Dautovic, E., Hau, H., & Huang, Y. (2017): "The Consumption Response to Minimum Wages: Evidence from Chinese Households", SSRN Electronic Journal.

Coulibaly, B., & Li, G. (2006): "Do Homeowners Increase Expenditure after the Last Mortgage Payment? An Alternative Test of the Permanent Income Hypothesis", *Review of Economics and Statistic, 88*(1), 10-19.

Dhawan-Biswal, U. (2002): "Expenditure and Income Inequality: The Case of Atlantic Canada from 1969-1996", *Canadian Public Policy, 28*(4), 513.

Hsieh, C. (2003): "Do Consumers React to Anticipated Income Changes? Evidence from the Alaska Permanent Fund", *American Economic Review, 93*(1), 397-405.

Mahboubi, P. (2018, February 18): "The ripple effect of Ontario's minimum-wage Increase", *Globe and Mail*, Retrieved November 28, 2018, from https://www.economics.utoronto.ca/gindart/2018-02-18 - The ripple effect of Ontario's minimum-wage increase.pdf

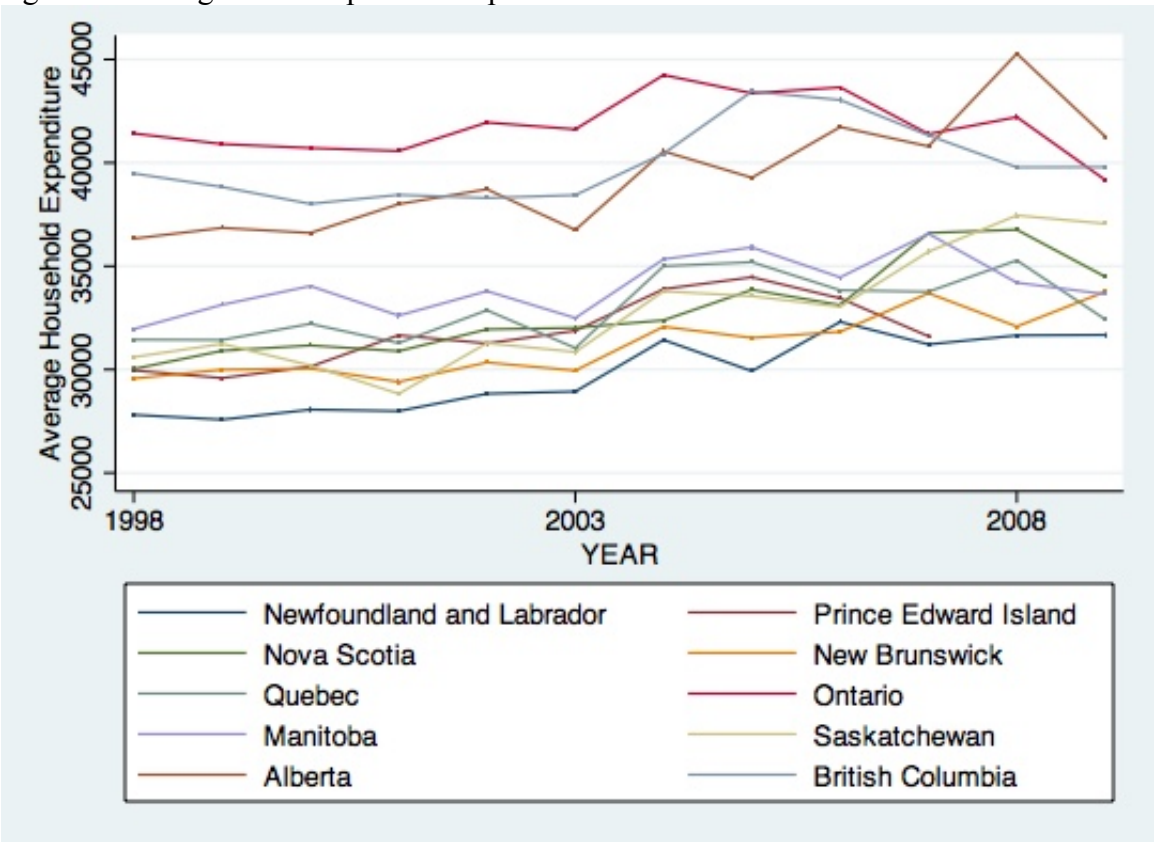
Neumark, D., Schweitzer, M., & Wascher, W. (2004): "Minimum wage effects throughout the wage distribution", *Journal of Human Resources*, 39(2), 425–450.

Nguyen, C. V. (2013): "The impact of minimum wages on employment of low-wage workers", *Economics of Transition, 21*(3), 583-615.

Norris, S., Pendakur, N. (2015): "Consumption inequality in Canada, 1997 to 2009", *Canadian Economics Association*, 48(2), 773-792

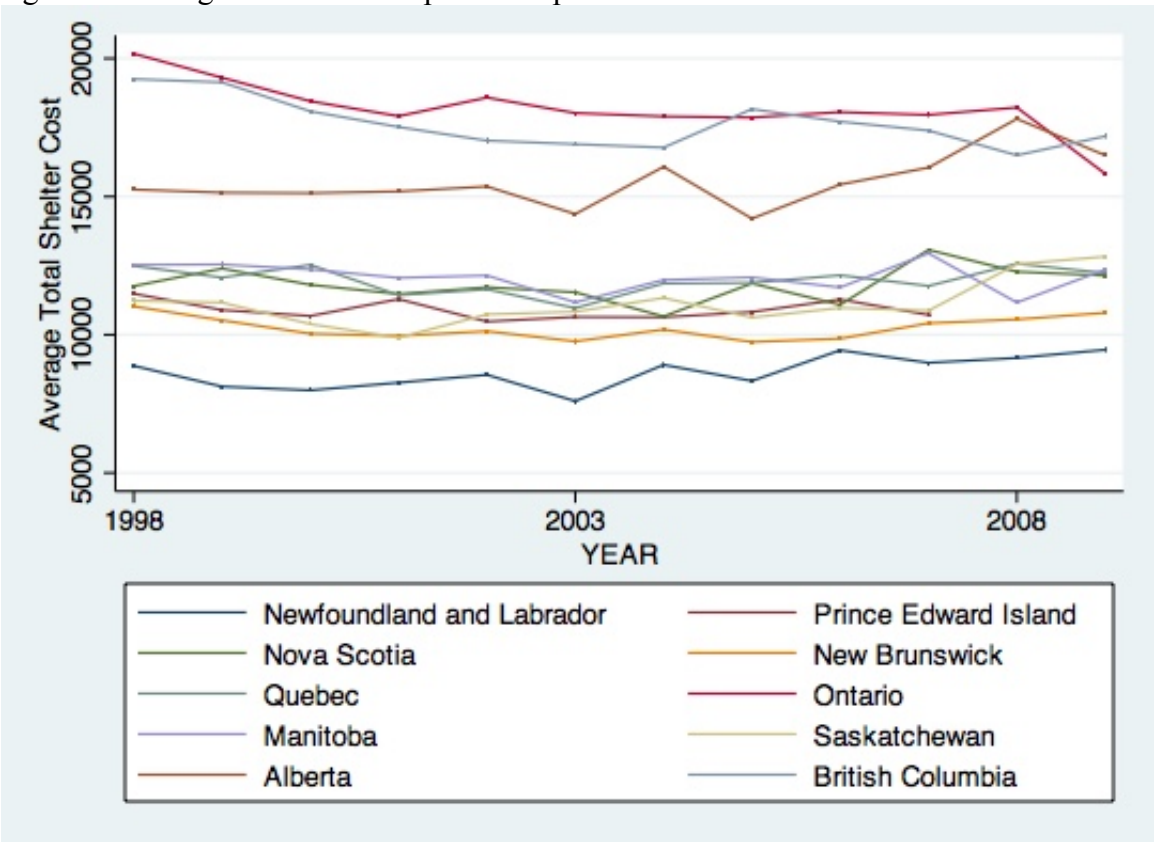
Parker, J., Souleles, N., Johnson, D., & Mcclelland, R. (2011): "Consumer Spending and the Economic Stimulus Payments of 2008", *American Economic Association, 103*(6), 2530-2553.

Figure 1. Average Total Expenditures per Canadian households



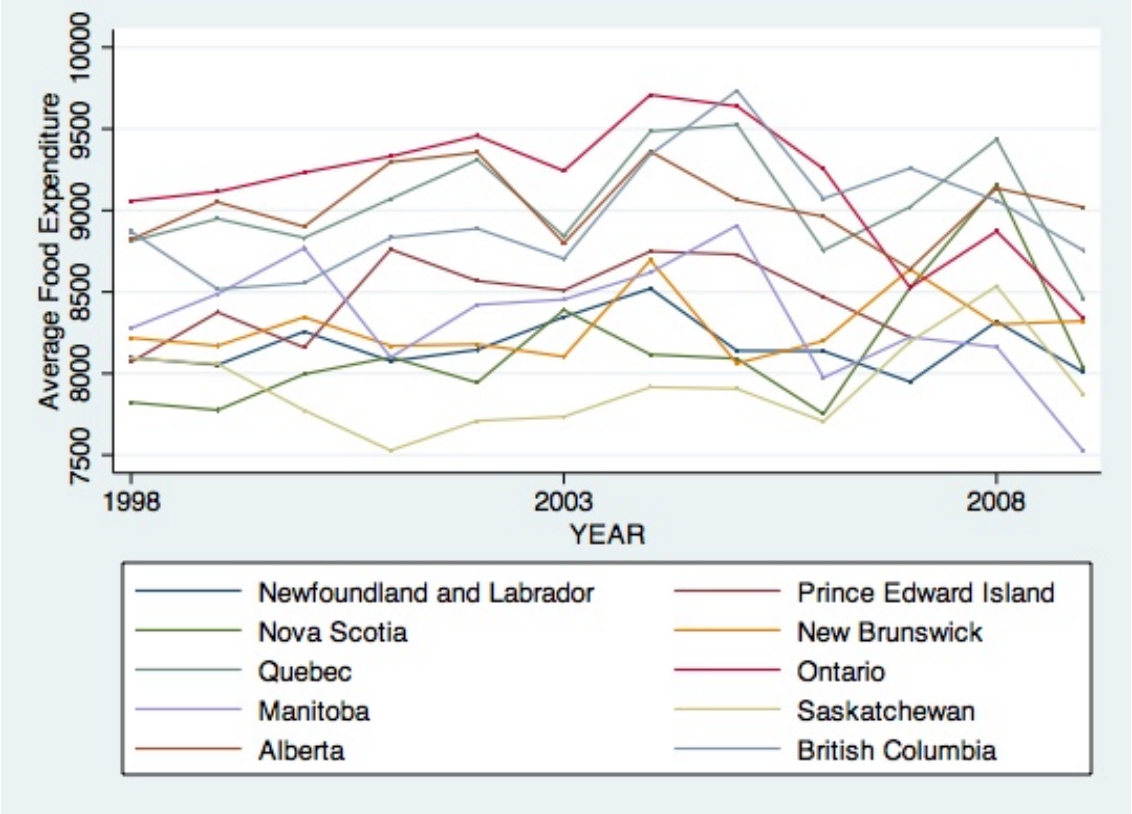

Notes: The data comes from the Survey of Household Spending for the years of 1998-2009. The average total household expenditure is in real dollars, deflated to 2017.

Figure 2. Average total shelter expenditure per Canadian households



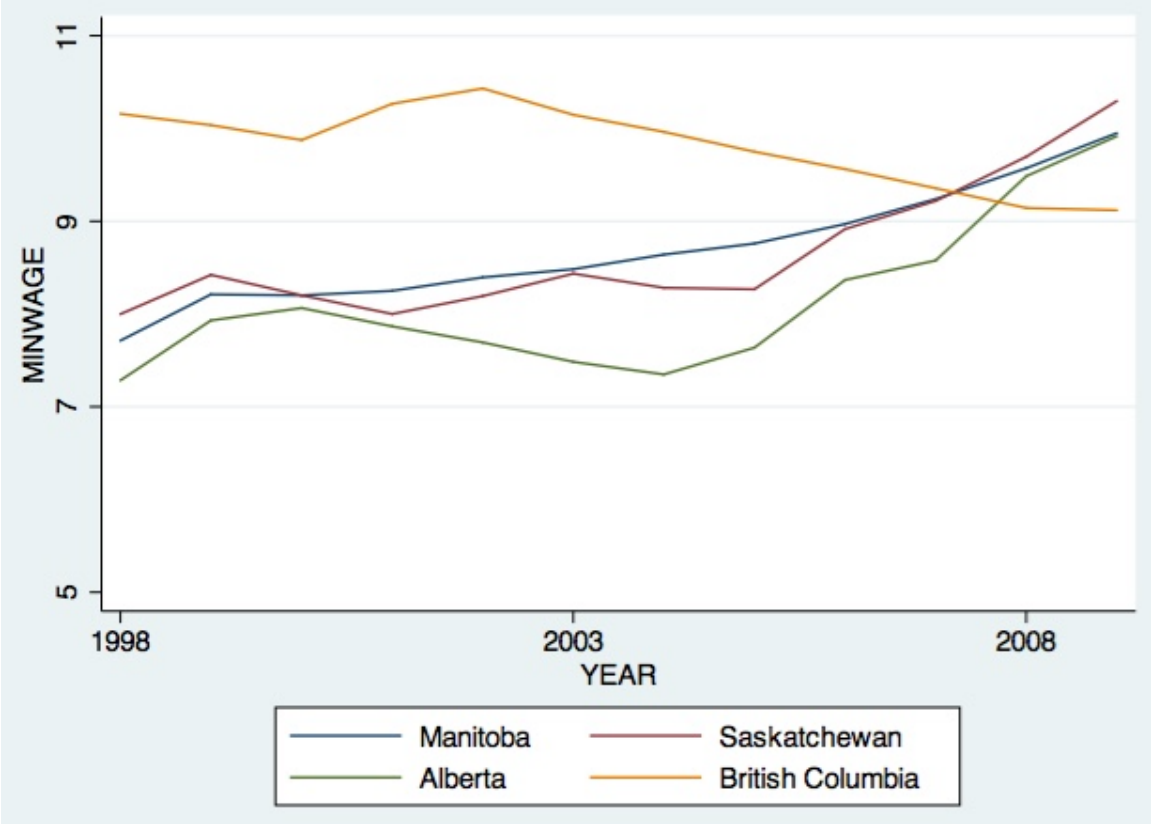

Notes: The data comes from the Survey of Household Spending for the years of 1998-2009. The average total shelter cost is in real dollars, deflated to 2017.

Figure 3. Average food expenditure per Canadian households



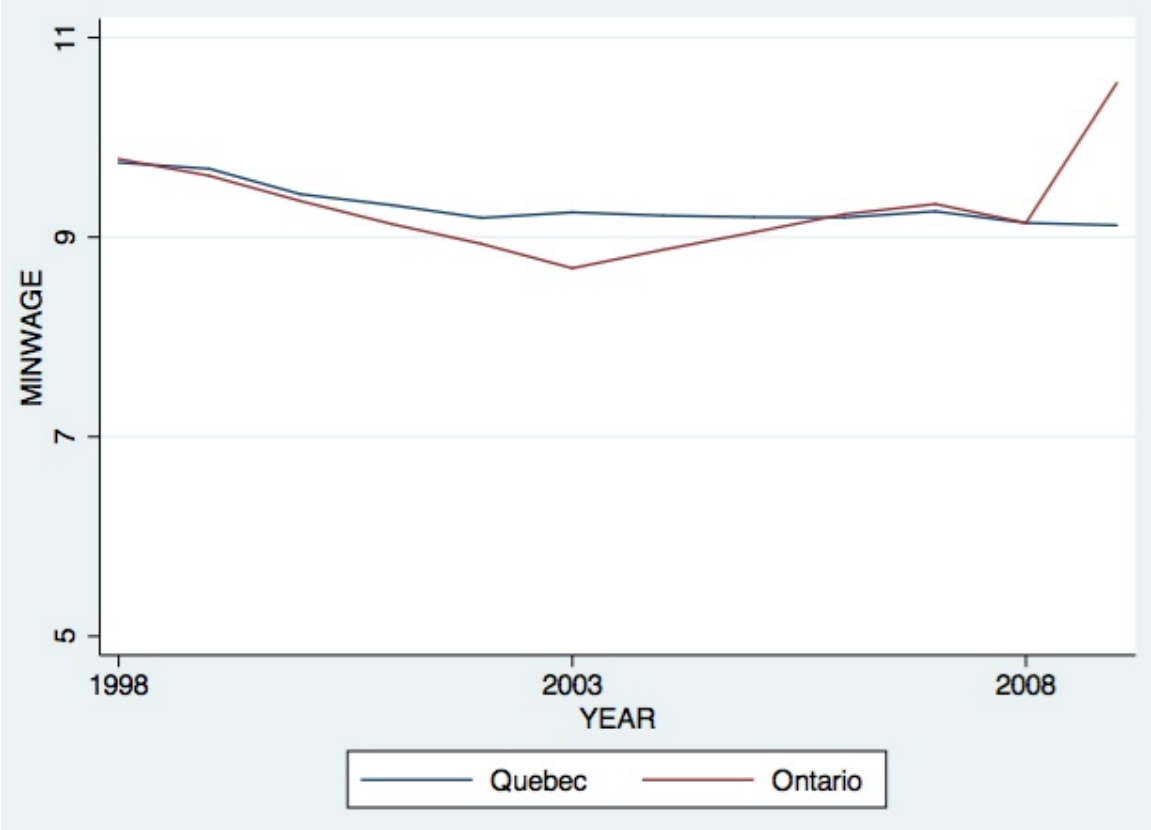

Notes: The data comes from the Survey of Household Spending for the years of 1998-2009. The average food expenditure is in real dollars, deflated to 2017.

Figure 4. Real minimum wage for the Western Provinces in Canada



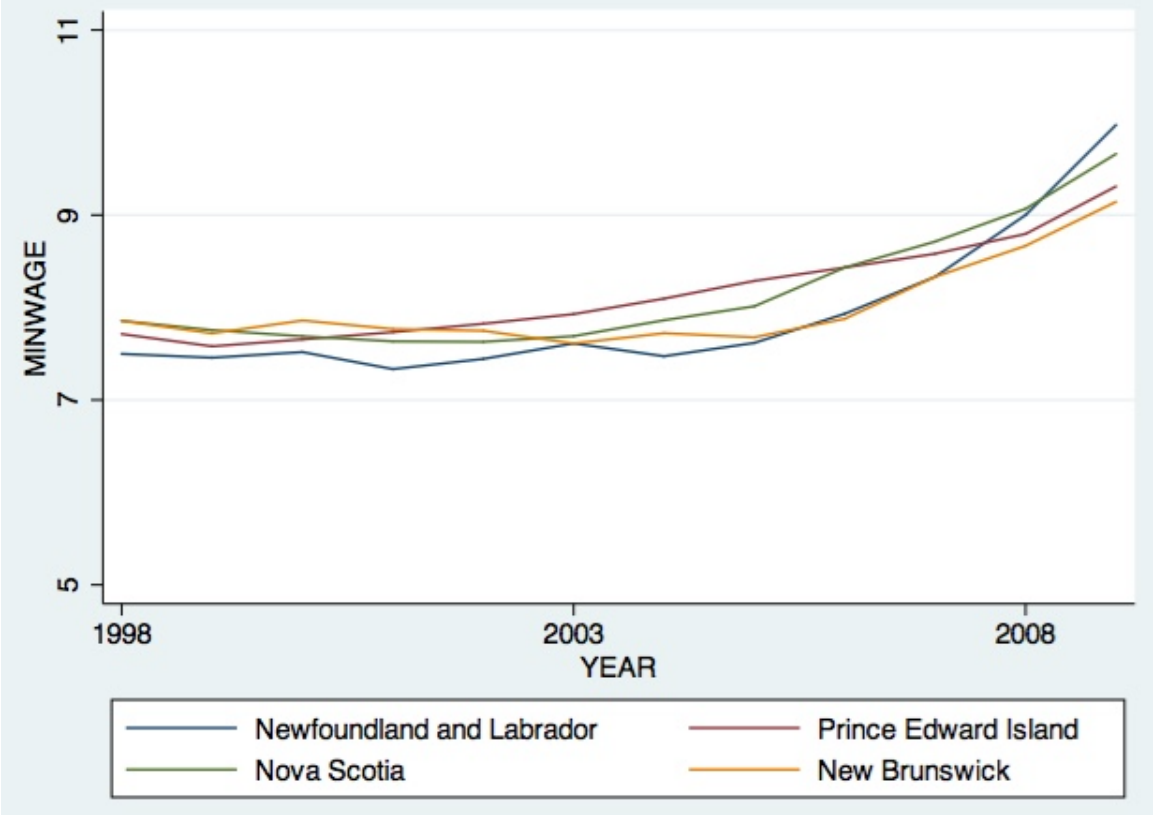

Notes: The data comes from the Government of Canada website, which supplies the adult minimum wage rate for each province and year. The minimum wage is expressed in real dollars. This data is deflated to 2017.

Figure 5. Real minimum wage for Ontario and Quebec




Notes: The data comes from the Government of Canada website, which supplies the adult minimum wage rate for each province and year. The minimum wage is expressed in real dollars. This data is deflated to 2017.

Figure 6. Real minimum wage for the Eastern Provinces of Canada




Notes: The data comes from the Government of Canada website, which supplies the adult minimum wage rate for each province and year. The minimum wage is expressed in real dollars. This data is deflated to 2017.

Table 1. Summary Statistics: Means and Standard Deviations below in brackets

| *Characteristic Variables* | Married | Single | Male | Female | Total |
|---|---|---|---|---|---|
| Observations | 5,198 | 3,281 | 3,512 | 4,967 | 8,479 |
| A. Minimum Wage | 9.069 | 9.130 | 9.132 | 9.058 | 9.092 |
| | (0.744) | (0.706) | (0.722) | (0.735) | (0.730) |
| B. Provinces | | | | | |
| Newfoundland and Labrador | 0.018 | 0.011 | 0.012 | 0.018 | 0.015 |
| | (0.132) | (0.104) | (0.107) | (0.133) | (0.122) |
| Prince Edward Island | 0.005 | 0.003 | 0.003 | 0.005 | 0.004 |
| | (0.067) | (0.053) | (0.054) | (0.069) | (0.062) |
| Nova Scotia | 0.034 | 0.026 | 0.022 | 0.038 | 0.031 |
| | (0.181) | (0.159) | (0.148) | (0.191) | (0.173) |
| New Brunswick | 0.032 | 0.021 | 0.026 | 0.029 | 0.028 |
| | (0.177) | (0.142) | (0.159) | (0.168) | (0.164) |
| Quebec | 0.267 | 0.289 | 0.312 | 0.244 | 0.275 |
| | (0.442) | (0.453) | (0.463) | (0.430) | (0.447) |
| Ontario | 0.334 | 0.287 | 0.291 | 0.337 | 0.316 |
| | (0.472) | (0.453) | (0.454) | (0.473) | (0.465) |
| Manitoba | 0.039 | 0.044 | 0.038 | 0.043 | 0.041 |
| | (0.194) | (0.204) | (0.191) | (0.204) | (0.198) |
| Saskatchewan | 0.039 | 0.041 | 0.040 | 0.039 | 0.040 |
| | (0.193) | (0.198) | (0.196) | (0.194) | (0.195) |
| Alberta | 0.121 | 0.131 | 0.124 | 0.127 | 0.125 |
| | (0.327) | (0.338) | (0.330) | (0.332) | (0.331) |
| Bristish Columbia | 0.112 | 0.148 | 0.132 | 0.120 | 0.126 |
| | (0.315) | (0.355) | (0.339) | (0.325) | (0.332) |
| C. Reference Age | | | | | |
| Less than 25 | 0.191 | 0.246 | 0.184 | 0.236 | 0.212 |
| | (0.393) | (0.431) | (0.388) | (0.425) | (0.409) |
| 25-29 | 0.809 | 0.754 | 0.816 | 0.764 | 0.788 |
| | (0.393) | (0.431) | (0.388) | (0.425) | (0.409) |

Notes: All means and standard deviations are weighted for the years of 1998-2009.

Table 2. Summary Statistics: Means and Standard Deviations below in brackets

| *Expenditure & Income Variables* | Married | Single | Male | Female | Total |
|---|---|---|---|---|---|
| Observations | 5,198 | 3,281 | 3,512 | 4,967 | 8,479 |
| A. Food Expenditure | | | | | |
| Purchase from Store | 6,130.50 | 3,474.14 | 4,787.81 | 5,368.85 | 5,099.46 |
| | (2,797.80) | (1,945.05) | (2,685.33) | (2,898.74) | (2,816.60) |
| Purchase from Restaurants | 2,041.88 | 1,710.35 | 2,105.46 | 1,747.01 | 1,913.20 |
| | (2,106.00) | (2,008.36) | (2,238.05) | (1,907.33) | (2,074.83) |
| B. Shelter Expense | | | | | |
| Total Shelter Expense | 14,955.79 | 10,150.18 | 12,778.10 | 13,360.62 | 13,090.55 |
| | (7,646.26) | (5,421.79) | (7,039.61) | (7,429.83) | (7,256.90) |
| C. Clothing Expenditure | | | | | |
| Female Clothing | 1,564.43 | 815.62 | 991.66 | 1,517.66 | 1,273.79 |
| | (1,714.14) | (1,415.79) | (1,580.42) | (1,662.35) | (1,645.82) |
| Male Clothing | 1,139.19 | 874.15 | 1,319.47 | 791.56 | 1,036.32 |
| | (1,250.30) | (1,630.15) | (1,688.14) | (1,069.95) | (1,415.75) |
| D. Transportation Expenditure | | | | | |
| Vehicle Gas | 2,532.14 | 1,126.65 | 2,035.79 | 1,944.10 | 1,986.61 |
| | (1,951.30) | (1,453.48) | (1,926.43) | (1,880.28) | (1,902.25) |
| Public Transportation | 747.36 | 780.12 | 815.17 | 712.45 | 760.08 |
| | (1,356.81) | (1,803.27) | (1,840.80) | (1,232.78) | (1,545.47) |
| E. Miscellaneous Expenditure | | | | | |
| Tobacco | 1,337.13 | 892.76 | 1,181.88 | 1,149.76 | 1,164.65 |
| | (2,398.41) | (1,727.28) | (2,093.86) | (2,240.18) | (2,173.50) |
| Alcohol purchase from License vendor | 373.42 | 646.71 | 613.24 | 363.89 | 479.50 |
| | (844.45) | (1,275.92) | (1,241.18) | (814.96) | (1,042.01) |
| Alcohol purchase from Liquor stores | 590.71 | 620.32 | 724.24 | 496.71 | 602.20 |
| | (824.88) | (993.23) | (1,040.58) | (728.35) | (894.05) |
| Charity donations | 327.38 | 105.66 | 210.78 | 267.72 | 241.32 |
| | (1,365.72) | (471.02) | (1,018.86) | (1,187.98) | (1,113.07) |
| Pension Contributions | 3,278.12 | 1,621.79 | 2,682.73 | 2,594.18 | 2,635.24 |
| | (2,719.57) | (1,963.70) | (2,656.38) | (2,517.87) | (2,583.23) |
| F. Household Income | | | | | |
| Income before tax | 73,103.81 | 36,497.79 | 59,895.05 | 58,031.69 | 58,895.61 |
| | (40,405.32) | (28,104.53) | (37,964.15) | (42,190.19) | (40,294.35) |
| Government Transfers | 4,788.12 | 3,470.71 | 3,142.20 | 5,257.52 | 4,276.78 |
| | (7,207.35) | (6,562.44) | (5,956.32) | (7,645.15) | (6,993.27) |

Notes: All means and standard deviations are weighted for the years of 1998-2009.

Table 3. OLS regression results

| Dependent Variables | Total Households | Married Households | Single Households |
|---|---|---|---|
| Household Income | -0.004 | 0.198*** | -0.280* |
| | (0.086) | (0.068) | (0.160) |
| Household Government Transfers | -0.012 | -0.251 | 0.260 |
| | (0.114) | (0.153) | (0.168) |
| *Expenditure Categories* | | | |
| Total Expenditure | 0.047*** | 0.051*** | 0.029 |
| | (0.013) | (0.014) | (0.020) |
| Food from Stores | 0.007 | -0.016 | 0.019 |
| | (0.018) | (0.018) | (0.029) |
| Food from Restaurants | -0.006 | 0.059 | -0.098 |
| | (0.044) | (0.053) | (0.072) |
| Women's Clothing | -0.003 | 0.028 | -0.118 |
| | (0.073) | (0.041) | (0.135) |
| Men's Clothing | 0.010 | 0.111** | -0.148 |
| | (0.069) | (0.053) | (0.129) |
| Vehicle Gas | 0.062 | 0.168 | -0.110 |
| | (0.095) | (0.103) | (0.154) |
| Public Transportation | -0.025 | -0.008 | -0.068 |
| | (0.084) | (0.121) | (0.117) |
| Tobacco | 0.020 | -0.151 | 0.251 |
| | (0.111) | (0.153) | (0.163) |
| Alcohol Purchases (Bars/Restaurants) | -0.157* | -0.126 | -0.193 |
| | (0.090) | (0.119) | (0.137) |
| Alcohol Purchases (Liqour Stores) | -0.128* | -0.200** | -0.060 |
| | (0.076) | (0.096) | (0.121) |
| Charity | -0.182** | -0.070 | -0.291*** |
| | (0.082) | (0.113) | (0.111) |
| Pension | 0.029 | 0.221*** | -0.232* |
| | (0.072) | (0.064) | (0.127) |
| Shelter | 0.184*** | 0.156*** | 0.198*** |
| | (0.042) | (0.054) | (0.064) |
| Province Fixed Effects | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES |
| Observations | 8,479 | 5,198 | 3,281 |

Notes: All regressions are estimated using OLS with standard errors in brackets. All regressions are weighted. *is 10% significance. **is 5% significance. ***is 1% significance.

Table 4. OLS regression results by gender of the reference person

| | Total Households | | Single Households | |
|---|---|---|---|---|
| Dependent Varibles | Males | Females | Males | Females |
| Household Income | 0.021 | -0.067 | -0.195 | -0.276 |
| | (0.094) | (0.134) | (0.150) | (0.254) |
| Household Government Transfers | -0.088 | 0.054 | 0.209 | 0.205 |
| | (0.170) | (0.150) | (0.237) | (0.216) |
| *Expenditure Categories:* | | | | |
| Total Expenditure | 0.0676*** | 0.026 | 0.211*** | 0.036 |
| | (0.020) | (0.018) | (0.070) | (0.023) |
| Food from Stores | 0.043 | -0.025 | 0.016 | 0.018 |
| | (0.030) | (0.022) | (0.051) | (0.035) |
| Food from Restaurants | -0.075 | 0.048 | -0.160* | -0.006 |
| | (0.062) | (0.062) | (0.095) | (0.105) |
| Women's Clothing | 0.084 | -0.074* | -0.196 | -0.184** |
| | (0.137) | (0.044) | (0.189) | (0.072) |
| Men's Clothing | 0.065 | -0.049 | 0.054 | -0.171 |
| | (0.065) | (0.105) | (0.104) | (0.166) |
| Vehicle Gas | 0.115 | -0.011 | -0.032 | -0.146 |
| | (0.138) | (0.129) | (0.230) | (0.205) |
| Public Transportation | -0.089 | 0.03 | -0.033 | -0.097 |
| | (0.126) | (0.114) | (0.174) | (0.158) |
| Tobacco | -0.071 | 0.104 | 0.100 | 0.409* |
| | (0.166) | (0.149) | (0.251) | (0.215) |
| Alcohol Purchases (Bars/Restaurants) | -0.031 | -0.268** | -0.004 | -0.266 |
| | (0.134) | (0.120) | (0.201) | (0.183) |
| Alcohol Purchases (Liqour Stores) | 0.051 | -0.300*** | 0.176 | -0.167 |
| | (0.109) | (0.106) | (0.161) | (0.167) |
| Charity | -0.199 | -0.197* | -0.387** | -0.249* |
| | (0.122) | (0.111) | (0.169) | (0.150) |
| Pension | 0.056 | -0.024 | -0.255* | -0.161 |
| | (0.089) | (0.106) | (0.141) | (0.191) |
| Shelter | 0.211*** | 0.160*** | 0.207* | 0.209*** |
| | (0.070) | (0.048) | (0.109) | (0.072) |
| Province Fixed Effects | YES | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES | YES |
| Observations | 3,512 | 4,967 | 1,352 | 1,929 |

Notes: Dependent variables are the 13 expenditure categories. All regressions are estimated using OLS with standard errors in brackets. All regressions are weighted. *is 10% significance. **is 5% significance. ***is 1% significance.

Table 5. OLS regression results restricting sample to individuals with education of highschool or below

| Dependent Variables | Total Households | Married Households | Single Households |
|---|---|---|---|
| Household Income | -0.171 | 0.138 | -0.297 |
| | (0.218) | (0.143) | (0.419) |
| Household Government Transfers | 0.063 | 0.099 | 0.012 |
| | (0.236) | (0.313) | (0.367) |
| *Expenditure Categories:* | | | |
| Total Expenditure | 0.003 | 0.033 | 0.014 |
| | (0.030) | (0.033) | (0.043) |
| Food from Stores | -0.036 | 0.003 | -0.049 |
| | (0.040) | (0.038) | (0.068) |
| Food from Restaurants | -0.063 | 0.058 | -0.170 |
| | (0.097) | (0.110) | (0.165) |
| Women's Clothing | -0.033 | 0.030 | 0.072 |
| | (0.171) | (0.099) | (0.316) |
| Men's Clothing | 0.038 | 0.196* | 0.072 |
| | (0.149) | (0.109) | (0.288) |
| Vehicle Gas | -0.124 | 0.179 | -0.216 |
| | (0.223) | (0.238) | (0.366) |
| Public Transportation | 0.059 | 0.135 | -0.064 |
| | (0.190) | (0.264) | (0.272) |
| Tobacco | 0.178 | 0.273 | 0.037 |
| | (0.264) | (0.350) | (0.407) |
| Alcohol Purchases (Bars/Restaurants) | -0.133 | -0.172 | -0.024 |
| | (0.196) | (0.265) | (0.298) |
| Alcohol Purchases (Liqour Stores) | -0.267 | -0.216 | -0.237 |
| | (0.172) | (0.217) | (0.274) |
| Charity | -0.351** | -0.090 | -0.469** |
| | (0.166) | (0.232) | (0.219) |
| Pension | -0.159 | 0.086 | -0.227 |
| | (0.178) | (0.132) | (0.324) |
| Shelter | 0.094 | 0.005 | 0.267** |
| | (0.073) | (0.074) | (0.136) |
| Province Fixed Effects | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES |
| Observations | 1,985 | 1,214 | 771 |

Notes: Dependent variables are the 13 expenditure categories, household income and government transfers. Married households were restricted by either the reference person or spouse had an education level of highschool education or below while the single household were restricted by the reference person who has an education of highschool or below. These regression results are for the years of 2004-2009. All regressions are estimated using OLS with standard errors in brackets. All regressions are weighted. *is 10% significance. **is 5% significance. ***is 1% significance.

Table 6. OLS regression results restricting sample to individuals with education of highschool or below

| | Total Households | | Single Households | |
|---|---|---|---|---|
| Dependent Variables | Males | Females | Males | Females |
| Household Income | 0.122 | -0.437 | 0.494 | -0.516 |
| | (0.257) | (0.333) | (0.434) | (0.661) |
| Household Government Transfers | -0.232 | 0.387 | -0.362 | 0.14 |
| | (0.373) | (0.285) | (0.551) | (0.389) |
| *Expenditure Categories:* | | | | |
| Total Expenditure | 0.046 | -0.034 | 0.073 | -0.014 |
| | (0.047) | (0.041) | (0.074) | (0.050) |
| Food from Stores | -0.057 | -0.025 | -0.155 | 0.002 |
| | (0.067) | (0.045) | (0.107) | (0.078) |
| Food from Restaurants | -0.048 | -0.049 | -0.220 | -0.049 |
| | (0.125) | (0.145) | (0.185) | (0.263) |
| Women's Clothing | 0.173 | -0.200* | 0.487 | -0.388* |
| | (0.316) | (0.119) | (0.397) | (0.231) |
| Men's Clothing | 0.174 | -0.056 | 0.233 | 0.258 |
| | (0.133) | (0.226) | (0.205) | (0.368) |
| Vehicle Gas | -0.125 | -0.101 | -0.210 | -0.031 |
| | (0.324) | (0.301) | (0.564) | (0.476) |
| Public Transportation | 0.185 | -0.001 | 0.228 | -0.294 |
| | (0.286) | (0.260) | (0.387) | (0.402) |
| Tobacco | 0.235 | 0.223 | 0.803 | -0.434 |
| | (0.395) | (0.363) | (0.605) | (0.561) |
| Alcohol Purchases (Bars/Restaurants) | 0.369 | -0.540** | 0.604 | -0.438 |
| | (0.290) | (0.260) | (0.419) | (0.406) |
| Alcohol Purchases (Liqour Stores) | 0.360 | -0.753*** | 0.844** | -0.765** |
| | (0.249) | (0.231) | (0.378) | (0.367) |
| Charity | -0.511** | -0.209 | -0.628* | -0.362 |
| | (0.252) | (0.225) | (0.336) | (0.293) |
| Pension | 0.133 | -0.416 | 0.457 | -0.486 |
| | (0.229) | (0.258) | (0.376) | (0.474) |
| Shelter | 0.161 | 0.021 | 0.345 | 0.145 |
| | (0.114) | (0.089) | (0.233) | (0.142) |
| Province Fixed Effects | YES | YES | YES | YES |
| Year Fixed Effects | YES | YES | YES | YES |
| Observations | 767 | 1,218 | 309 | 462 |

Notes: Dependent variables are the 13 expenditure categories, household income and government transfers. Total and single household were restricted by the reference person who has an education of highschool or below. These regression results are for the years of 2004-2009. All regressions are estimated using OLS with standard errors in brackets. All regressions are weighted. *is 10% significance. **is 5% significance. ***is 1% significance.