CHANGES IN CONSUMPTION DURING THE COVID-19 PANDEMIC IN CANADA

Abibat Olaoluwa Abiodun Anoba

(300133371)

Major Paper presented to the
Department of Economics of the University of Ottawa
in partial fulfillment of the requirements of the M.A. Degree

Supervisor: Professor Gamal Atallah

Ottawa, Ontario

April 2021

ABSTRACT

Consumption is a large component of Canada's Gross Domestic Product (GDP) and as such, it is important to examine its changes as it relates to the ongoing pandemic. This paper studies how consumption changed during the pandemic in Canada. To reduce the number of COVID-19 cases, a mandatory lockdown was implemented. I analyze the household final consumption expenditure data of 2019 and 2020 using a linear regression model with dummy variables. The analysis is done in Canada, all the provinces, and the categories of consumption: goods and services. The result shows that there was a 7.22% decline in daily consumption in Canada after the lockdown. At the provincial level, Alberta, Newfoundland, and British Columbia had the most decline in daily consumption after the lockdown, 9.83%, 8.03%, and 7.71%, respectively. Quebec, Saskatchewan, and New Brunswick had the least decline in daily consumption after the lockdown, 5.4%, 5.94% and 5.98%, respectively. Daily consumption of services fell by 13.5% after the lockdown while the daily consumption of goods rose by 0.475% but it was statistically insignificant.

ACKNOWLEDGEMENTS

I would like to express my appreciation to Professor Gamal Atallah for his supervision and help during the research process. I also want to thank Professor Roland Pongou for his comments and corrections on my research paper.

Table of Contents

1. Introduction

The Coronavirus pandemic hit the Canadian economy in early March of 2020. The World Health Organization declared COVID-19 as a pandemic on the 11th of March 2020 (WHO, 2020). On the 16th of March 2020, Canada announced a travel ban which started on the 18th of March 2020 (Prime Minister of Canada, 2020). There was a lockdown for schools, businesses, and outdoor areas that were deemed nonessential. This led to reduced business profits and less household income, as well as increased unemployment for individuals. As a way of remedying the losses, the Canadian government initiated the COVID-19 Economic Response Plan. The economic response included programs that provide support to individuals, students, families, and firms. The response plan was released with reforms and new programs coming later. Some of the already existing programs were adjusted to provide support during the pandemic. The Employment Insurance (EI) sickness benefit was one of the existing programs adjusted to cater to Canadians during the pandemic. The requirement of a medical certificate and the one-week waiting period were waived for individuals on imposed quarantine that claim EI sickness benefits (Government of Canada, 2020). The initial release was done in March 2020 and was not inclusive of individuals of varied situations and firms in every sector. With time, the subsequent plans released were well-thought-out and more detailed, making them accessible to a wider range of people.

The lockdown led to the total or partial shutdown of businesses. This led to an increase in unemployment. As of April 2020, Canada's unemployment rate was 17.8% which rose by 5.2 percentage points from March of 2020 (Statistics Canada, 2020). Businesses had to move their operations online or reopen at a low capacity while maintaining safety measures, to avoid

a total shutdown. According to Malley and Moutos (1996), there is a negative relationship between unemployment and consumption. That means that the lockdown has an indirect effect on consumption. The high level of uncertainty caused by the pandemic is seen as a motive for households to save more as a precautionary measure to protect themselves from challenges to come (Mody et al, 2012). Precautionary savings cause households to reduce consumption which affects GDP growth (Mody et al, 2012). This research is crucial as it helps to shed light on how the pandemic affected household consumption. The outcome of this study will provide clarity on how much weight needs to be put on reviving consumption as one of the strategies to boost the economy.

The rest of the paper is organized as follows: section 2 presents a literature review of the impact of the pandemic on various aspects of the economy. I also address the contribution of this study to the literature. Section 3 will focus on the analysis of data to explore changes in consumption during the pandemic. Section 4 discusses the results of the analysis. Section 5 concludes and provides other areas of research to be explored for future research.

2. Literature Review

The pandemic is still ongoing but there has been tangible research on various aspects of its impact. There is still a lot more research to be done to fully grasp the extent of the economic impacts caused by the pandemic and how the economy could potentially crawl back to a stable/optimal position.

Robson (2020) details Canada's main public policy response to the working class to ensure income security during the pandemic. The paper also assesses the trend in COVID-19 policymaking to discern how and why the governments swiftly embraced a "trust-but-verify" approach to income support. The trust-but-verify approach allows for the allocation of benefits before verifying eligibility. The author deciphers the evolution of income support policy during the pandemic into three phases. Phase I involved modest changes to existing programs while phase II was the amendment of existing tools and phase III was the creation of new national programs. In the pre-COVID era, income support programs had a "verify-then-trust" approach with detailed application and documentation that the applicant meets the eligibility criteria. The paper concludes that during the initial wave of COVID-19, there was an increase in policy adaptation and the adoption of a trust-but-verify mode of delivery. Although the trust-but-verify approach is not new as this is the case when filing taxes, this approach is not suitable to handle the volume of demand during the pandemic

Chetty et al (2020) evaluate how COVID-19 impacts the economy by examining the heterogeneity in its impact. The data for the analysis was obtained from private companies from a database built to track real-time economic activity at a granular level. The analysis is done using regression discontinuity and difference-in-difference. High-income earners, especially those in areas with a high number of COVID-19 cases and in sectors that required physical interaction, were found to reduce spending sharply in mid-March 2020. High-wage workers experienced job losses that lasted for a few weeks while low-wage workers experienced huge job losses that lasted for several months. Spending and employment were found to not respond well to the state-ordered reopening of the economy. Evidence suggests that stimulus payment caused a sharp increase in consumer spending among low-income households. The paper

concludes that social insurance might be more effective in suppressing economic challenges during the pandemic rather than increasing aggregate demand.

Baker et al (2020) explore the household consumption response to the onset of the COVID-19 pandemic in the United States. Using transaction-level financial data, the paper examines the pattern of user spending in a regression framework. The paper shows that individual total spending increased by 40% across a wide range of categories in the first half of March 2020. The second half of March 2020, which tallies with the spreading of the disease, was followed by a 25%-30% decrease in overall spending except for food delivery and grocery shopping. As the number of COVID-19 cases increased, states legislated shelter-in-place orders, forcing people to limit trips outside and their exposure to others. States with active shelter-in-place orders responded strongly to spending. Nonetheless, individuals in all states had sizable responses. The analysis shows that during the latter part of March, the largest decline in spending was found in households with children or low levels of liquidity.

Blit (2020) focuses on how recessions could increase aggregate productivity and lead to a higher standard of living by fostering automation and the reallocation of productive resources. There is evidence of this in the United States and the paper provides evidence that this is also the case in Canada. The study shows that retail, construction, manufacturing, wholesale, and transportation industries are likely to experience the most transformations. The transformation is dependent on the government not interfering in the process of restructuring. The paper claims that the COVID recession is largely self-induced pending that it happened because of the response to the pandemic. The COVID recession, unlike other recessions, may cause a greater hike in the degree of automation due to COVID-specific health incentives. The Canadian

monthly data for employment per capita was used to analyze changes in routine and non-routine jobs for the period of 1987- 2020. These periods are inclusive of the recessionary periods. The analysis shows very steep drops in routine employment during recessionary periods while non-routine jobs remained unaffected. The comparison of the United States and Canada suggests that Canada's recessions create a harder push towards accelerating automation and increasing productivity. The paper claims that recessions are crucial for automation and reallocation that increase long-run aggregate productivity. Social distancing, one of the safety measures for COVID-19, has resulted in physical separation and digitalization of tasks. This increases the likelihood of automation with artificial intelligence.

Bryant et al (2020) examine how Canada as a liberal welfare state is mitigating the impact of the pandemic. A liberal welfare state creates a society that allows for systematic social and health inequalities. The authors believe that the impact of the pandemic was gendered, racialized and class related. This goes against the belief that the pandemic affected everyone equally. The paper asserts that the support programs made available during the pandemic only address the immediate needs of those who are in distress. Targeted support, which is part of Canada’s liberal welfare state, does not address the wider pattern of income, food insecurity, housing or build a new system to disrupt the structural imbalance of power within the labor market. The paper argues that having targeted supports will only create room for the economy to walk its way back to the pre-pandemic era once the health crisis comes to pass. This crisis should be used as an opportunity to improve the social safety net rather than return to the pre-COVID times.

Andersen et al (2020) illustrate the effect of social distancing laws on consumer spending during the COVID-19 pandemic in the Scandinavian regions. The paper seeks to find trends in consumer spending caused by the pandemic in Denmark and Sweden while also dissecting the impact of the shutdown in Denmark from the impact of the pandemic itself. The paper highlights that change in consumer spending in Denmark was dependent on age; young people under the age of 29 had a decreased spending of 10% while adults over the age of 70 increased spending. The outcomes show that the drop in economic activity during the pandemic was less about the government restrictions and more about the perceived disease risks influencing behavior.

Ali (2020) probes into the potential correlation between COVID-19 and consumer spending towards electronic durable goods in Iraq to comprehend consumer adaptations to the related restriction. He used data of electronics for the first halves of 2019 and 2020 from Samsung Electronics in Iraq. Since the pandemic started, businesses have had to move their operations online and embrace electronic commerce. The comparison of sales in both years shows that there has been a steady decline in sales in 2020 with the largest decrease in June by 47%. The paper concludes that the pandemic may have resulted in Iraqi consumers adopting technology and change in lifestyle due to the restrictive circumstances.

Achou et al (2020) investigate the initial impact of the pandemic on the finances of households and unemployment levels in Quebec, one of the hardest-hit provinces by COVID-19. The study was done surveying about 3000 residents of Quebec aged 25-64 years and respondents were rewarded with loyalty rewards from their choice of retailer. The survey covered five categories which included: demographics questions, pre-crisis (2019) employment, and financial situation, April 2020 employment and financial situation, expectations for the

future, and preferences. The findings show that those laid-off have reduced spending but not as much as anticipated. Other households experienced reduced spending due to the lockdown which resulted in a decrease in expenditures such as transport, leisure, etc. The findings also show that lower-income households and households that reported losing a job due to COVID, both benefitted from the Canada Emergency Response Benefit (CERB). Although, about half of CERB recipients had savings that were equivalent to the maximum CERB benefit and could survive for a while by withdrawing savings.

Chen et al (2020) investigate the impact of COVID-19 on consumption in China after the outbreak. The paper uses daily transaction data from 214 cities via UnionPay card and QR scanner transactions. The analysis is done using a difference-in-difference model to estimate changes in consumption after China had a lockdown on the 23rd of January 2020. The analysis also covers the duration of the lockdown which lasted for 12 weeks. The study shows that daily offline consumption fell by 32% per city and spending on goods and services declined significantly during the twelve weeks period by 33% and 34% respectively. The greatest dip within the categories of consumption is found in the dining & entertainment and travel sectors, 64%, and 59%, respectively. Wuhan, the epicenter, observes the largest consumption decrease across cities. The paper concludes that China's offline consumption decreased by 1.2% of China's 2019 GDP. The paper suggests containing the virus with less impact on consumption and faster consumption recovery would have economic benefits.

The Nielsen survey was used by Coibion et al (2020) to study changes in household spending and macroeconomic expectations due to the difference in timing of local lockdowns in the United States. The survey got over 10,000 respondents with over 50% of the participants

experiencing income and wealth loss due to the pandemic. The results imply that the earlier the lockdown was implemented by counties, it is expected that the county would experience lower future inflation, higher uncertainty, a continuous rise in the unemployment rate, and a lower mortgage rate for the next ten years.

Guzman et al (2021) explore the role of ethnic divisions on the outcome of the COVID-19 restrictions in the United States. The difference-in-difference approach was used for the study. The dataset used for this study includes data on COVID-19 cases and deaths, social distancing, government policies and socio-demographic characteristics. The authors found that after the declaration of a state of emergency, areas with low levels of ethnic diversity had lower COVID-19 cases and deaths when compared to areas with high levels of ethnic diversity. The paper suggests that ethnicity also plays an important role as it could serve as a barrier for communication among groups. Therefore, policies which promote ethnic and racial desegregation can help to lighten the impact of the pandemic by decreasing the likelihood of disease spread.

Pongou et al (2020) study how the economic and health impacts of the COVID-19 depend on an individual's social network. The paper argues that the infection incidence level and a network of physical contacts are crucial to the rate of infection, recovery, death, lockdown, and economic losses. The SIR model (Susceptible Infected Recovered model) and an extension of the model, N-SIRD model were used for this research. The N-SIRD model considers the number of deaths (D) and the network of physical contacts (N). The findings show that due to segregation, minority groups tend to suffer more in terms of death rate, infection rate and

economic costs, during a pandemic like COVID-19. Health and economic dynamics among the population is influenced by segregation.

Contribution to the literature

This paper will contribute to the existing literature by conducting an empirical study on how the average daily final consumption has been impacted by the pandemic due to the lockdown policy. I will use the Ordinary Least Squares methodology with dummy variables to analyze the dataset. I will analyze the data of the year before COVID and the year of COVID. The analysis is done in Canada, all the provinces, and the categories of consumption: goods and services. The dummy variables approach will allow us to analyze the changes in consumption due to the lockdown. This is relevant as it contributes to the existing literature on how the pandemic has impacted economic activities in Canada. The outcome of the study could also be useful to policymakers, giving them insights on areas to target when making policies to boost the economy.

3. Data Description

In this section, I discuss the dataset I will use, which is a micro-level panel dataset sourced from The Conference Board of Canada. This study will compare the changes in consumption during the pandemic and after the lockdown in Canada using data from quarter 1 of 2019 to quarter 4 of 2020. The comparison will be done at the national level, provincial level, and amongst the categories of consumption. The data used is the quarterly data of household final consumption expenditure. The data is seasonally adjusted and estimated at 2012 constant

prices. I will use the final household consumption expenditure variable and categories of consumption. Those categories include goods, durable goods, semi-durable goods, non-durable goods, services, services relating to dwelling and property, and other services. The household final consumption expenditure was converted into a daily average final consumption expenditure.

The daily average final consumption is the dependent variable. It is derived by dividing the final household consumption by three since it is quarterly data. The result is then divided by the number of days in a month. The number of days is dependent on the month in the specific quarter. Measuring the changes in consumption is essential as it is one of the main economic activities and a measure of the standard of living. I graph the raw data to see the trends and changes in consumption between 2019 and 2020. From figure 1, it is apparent that there was a steady increase in consumption in 2019. Figure 1 also shows that there was a decline in the first quarter of 2020, followed by a sharp decline in the second quarter of 2020. The pandemic started in the first quarter of 2020 which matches the first decline in Figure 1. Canada experienced its first wave of COVID on the 11th of March 2020, which is towards the end of the first quarter of 2020, which led to lockdown, partial/full closure of business that resulted in the mass loss of jobs. Loss of job is associated with reduced spending which explains the sharp decline in the second quarter of 2020 (Ganong and Noel, 2015).

I also check for trends among the five provinces that are the most populated and among the provinces that are the least. According to Statista, Ontario, Quebec, Alberta, British Columbia, and Manitoba were the five most populated provinces (Statistics Canada, 2020). From figure 2, we see that Ontario, which had the largest number of COVID-19 cases and is the

most populated province, also had a steep decline in consumption in quarter 2 of 2020. The other provinces had a slightly less steep decline in consumption. The steepness in the decline seems to decrease if the province is less populated and has a lower number of COVID-19 cases. Manitoba, which had the least number of COVID-19 cases, barely has a decline in consumption in quarter 2 of 2020 compared to Ontario which had the steepest decline and the highest number of COVID-19 cases. Figure 3 shows the trends amongst the provinces that are the least populated and also happen to have the least number of COVID-19 cases. The situation in figure 2 where lower COVID-19 cases usually entail less decline in consumption, is not the same as in figure 3. Although the two provinces with the least number of COVID-19 cases also have a very small decline in consumption, there is more variation among the remaining provinces. That is, the steep decline found for the remaining four provinces does not necessarily occur for provinces with lower COVID-19 cases as found in figure 2.

Figures 4 and 5 are a graphical representation of the trends in consumption by category: goods and services. The trends in each category give an idea of which categories of consumption are considered essentials or non-essentials by the spending pattern. The essential categories show a sharp or steady increase while the non-essential categories show a sharp or steady decline. Figure 4 focuses on the trends in goods, a category of consumption. Overall, there was less consumption of goods in quarter one of 2020 and then, a drastic decline in quarter two of 2020. There was a steep increase in consumption in quarter three, which was higher than consumption in 2019. Consumption remained stable in the fourth quarter. In figure 4, we see that non-durable goods, which are also known as consumer goods, had a different trend. Non-durable goods had an increase in quarter 1 of 2020, this was the start of the pandemic, during which there are increased levels of uncertainty surrounding the pandemic. The supply chain was

disrupted, and consumers were stockpiling as a precautionary measure. There was a decline in consumption of non-durable goods in the quarter, followed by an increase in quarter 3 and it eventually stabilized in quarter 4. The changes in the consumption of non-durable goods are different from the changes in the consumption of durable and semi-durable goods. The changes are also not as drastic. Durable and semi-durable goods have similar trends except that durable goods have a steeper increase in the third quarter of 2020 compared with semi-durable goods. From figure 4, we can tell that non-durable goods were essential while semi-durable goods and durable goods were non-essential.

The service category of consumption had a slight decrease in the fourth quarter of 2019 and the first quarter of 2020 (figure 5). There was a drastic decrease in quarter 2 of 2020 which was followed by a slightly steep increase. The increase was not as drastic as the decrease. Services related to dwelling and property did not change. Comparing figures 4 and 5, goods are more essential than services. The decline in consumption of goods was less steep and the increase was more drastic. The effect of the lockdown can be seen in trends in figures 1 to 5, particularly in figure 5. The lockdown meant no outdoor activities, gatherings, and all non-essential services. Services such as recreation and sporting activities, miscellaneous services, transport, and accommodation services were closed during the lockdown. Remote working and learning became very popular during the pandemic, and indoor activities became the new normal.

4. Model and Methodology

For this analysis, I use the Ordinary Least Squares model with dummy variables because it allows me to examine the effect of the mandatory lockdown on consumption levels. The model is written as follows:

$$Y = \beta_0 + \beta_1 pcovid + \beta_2 plockdown + \varepsilon$$

where the dependent variable Y is the daily average final consumption (in million CAD). The dummy variable *pcovid* is defined as 1 for the year 2020 and 0 otherwise. The variable *plockdown* is defined as 1 for days after March 18th, 2020 which is when Canada declared a travel ban and went on lockdown. β_1 captures the changes in consumption in the year 2020, which is the year COVID started. β_2 captures the change in consumption after the start of the lockdown. I use the log of the dependent variable to normalize the dataset. This will provide the percentage change in consumption after the start of the pandemic and after lockdown.

5. Results

The results are subdivided into three parts: total consumption, provincial total consumption, and the categories of consumption

5.1 Results for total consumption

The regression estimation results can be observed in table 1. The first column of table 1 shows the results without the robust standard errors. Here, I observe that the coefficient estimate

of the post covid variable is -0.0132 and it is significant at the 5% level. This means that the pandemic caused a 1.32% decrease in average daily household final consumption expenditure in Canada. The second column includes the robust standard errors treatment, which ensures a consistent and unbiased coefficient. A decrease in the standard error is observed for the post covid variable. The robust standard error method removes any possible presence of heteroskedasticity or autocorrelation that may be present in the idiosyncratic errors in column one. From table 1, I also observe that the coefficient estimate of the post lockdown variable is -0.0722 and it is statistically significant at the 1% level. This means that after the lockdown there was a 7.22% decrease in daily household consumption.

5.2 Results at the provincial level

Now, we examine the changes in consumption at the provincial level. I first explore the changes among the five most populated provinces. According to table 2, we see that Ontario experienced a 1.16% decrease in consumption and it is statistically significant at the 1% level. The percentage decrease in daily average consumption is observed to be higher after the lockdown. The coefficient estimate for post lockdown is -0.0740 and it is statistically significant at the 1% level. From table 3, I observe that the coefficient estimate of post lockdown is -0.0187 and it is statistically significant at the 1% level. That is, a 1.87% decrease in daily consumption is observed in Quebec when the pandemic started. This is slightly more when compared with that of Ontario. The lockdown resulted in a 5.4% decrease in daily consumption in Quebec. The coefficient estimate of post lockdown is noticed to be statistically significant at the 1% level.

A 1.54% decrease in consumption after the pandemic started and after the lockdown, a 9.83% decrease is detected in Alberta. Both coefficient estimates are statistically significant at the 1% level. The post lockdown coefficient estimate for Alberta is quite high compared to Ontario and Quebec, even though the latter provinces are more populated. I observe from table 5 that the post covid coefficient estimate is -0.0110 for British Columbia and it is statistically significant at the 1% level. Table 5 which presents the OLS estimates for average daily household total consumption in British Columbia, shows that the coefficient estimate for post lockdown was -0.0771 for British Columbia and is statistically significant at the 1% level. British Columbia had a 7.71% decrease in daily consumption after the lockdown. This is higher than Quebec and Ontario. In Table 6, we see that the post covid coefficient estimate is 0.00352. This is the only province with a positive coefficient, although it is not statistically significant at the 10% level. In Manitoba, there was a 6.63% decrease in daily consumption after the lockdown according to table 6. After assessing tables 2 to 6, we see that there is no correlation between having a higher level of COVID-19 cases and having a higher decrease in daily consumption.

I will be analyzing the changes in consumption after the pandemic started and after the lockdown among the least populated provinces. The territories are the least populated. From table 12, the coefficient estimate for post covid is 0.0104 and the post lockdown coefficient estimate is -0.0644. Both coefficient estimates are statistically significant at the 1% level. An observation of Table 11 shows that the coefficient estimates of post covid and post lockdown for Prince Edward Island are statistically significant at the 1% level, which are -0.0245 and -0.0777, respectively. Newfoundland (table 10) experienced a 0.782% increase in consumption when the pandemic started, and it is significant at the 10% level. The post lockdown was -0.0802

and is significant at the 1% level. The daily decrease in consumption for Newfoundland after the lockdown is higher than the decrease in Prince Edward Island and the Territories.

According to table 9, New Brunswick had a 5.98% decrease in daily consumption after the lockdown. Table 9 also shows that there was a 0.239% decrease in daily consumption in New Brunswick when the pandemic started but it is not statistically significant, unlike the coefficient estimate of post lockdown which is statistically significant at the 1% level. From Table 8, we see that Nova Scotia encountered a 1.24% decrease in daily consumption during the pandemic and it has a 5% level. We also see from table 8 that there was a 7.52% decrease in daily consumption after the lockdown with a 1% level. When compared to New Brunswick, Nova Scotia suffered a large decrease in lockdown after the pandemic. As stated in table 7, Saskatchewan had a 1.71% decrease in daily consumption after the pandemic started while encountering a 5.94% decrease in daily consumption after the lockdown. Both values are statistically significant at the 1% level. Saskatchewan's post lockdown decrease in daily consumption is like New Brunswick's. Considering that Saskatchewan is the most populated province among the least populated provinces, its daily consumption was not as impacted as the remaining provinces.

5.3 Results for consumption categories

The Conference Board of Canada data classifies consumption into two categories: goods and services. I will be investigating how both categories of consumption reacted to the pandemic and the lockdown, stating with the goods category. From table 13, I observe that there was a decrease in consumption by 1.55% and it is significant at the 5% level. Meanwhile, the

coefficient estimate of post lockdown shows an increase of 0.475% but it is not statistically significant. Considering that there was a stockpiling due to the uncertainty caused by the pandemic, it is not surprising that there was an increase in daily consumption even though it is not statistically significant. There is a further breakdown of the goods category of consumption into durable goods, semi-durable goods, and non-durable goods.

Examining tables 14 to 16, which present the regression outputs for durable goods, nondurable goods, and semi-durable goods, we see that all but one of the coefficients estimates of post covid and post lockdown are statistically significant at the 1% level. Only the coefficient estimate of post lockdown for semi-durable goods is significant at the 5% level. There is a 4.31% increase in the consumption of non-durable goods when the pandemic started and a 2.1% decrease in consumption after the lockdown. Consumption of durable goods fell by 9.32% when the pandemic started and saw a 4.16% increase after the lockdown. Semi-durable goods consumption fell by 8.58% after the start of the pandemic and rose by 2.04% after the lockdown. The consumption of durable and semi-durable goods follows the same trend.

Looking at tables 17 to 19, we see the regression estimate of the service category of consumption. Table 17 gives an estimate of service consumption overall. Per table 17, services declined by 1.13% after the pandemic started and declined by 13.5% after the lockdown. The decrease in the consumption of services after the lockdown is not shocking as the lockdown measures heavily clamped on the service sector such as restaurants, gyms, etc. As stated in table 18, services related to dwelling and property increased by 2% and fell by 0.5% after the lockdown. The consumption of other services fell by 5.11% after the pandemic started and

declined by 20.3% after the lockdown. Comparing the estimation for goods and services, the lockdown impacted the daily consumption of services more than the consumption of goods.

6. Conclusion

In this paper, we analyzed the changes in consumption during the pandemic in Canada at the national level, provincial level and among the categories of consumption. The results of the estimation show evidence of a decline in consumption after the lockdown began. The regression estimates emphasize that there was a 7.22% decline in daily consumption in Canada after the lockdown. At the provincial level, Alberta, Newfoundland, and British Columbia had the most decline in daily consumption after the lockdown, 9.83%, 8.03% and 7.71%, respectively. Daily consumption of services fell by 13.5% after the lockdown while the daily consumption of goods rose by 0.475% but it was statistically insignificant.

The lockdown was a measure put in place to reduce the number of COVID-19 cases to flatten the curve. During the lockdown, there was little to no economic activity going on. Businesses, schools, gyms, cinemas, and all non-essential services were shut down. The COVID-19 pandemic caused a downward economic shock (Miller and Radcliff, 2020). Coupled with the fact that many workers lost their jobs, there was also a lot of uncertainty due to the pandemic. As such, there was da shift in spending patterns. The government created the Canada Economic Response Plan to soften the blow of the pandemic on individuals and firms. The Canada Emergency Student Benefit (CESB), CERB and modified EI sickness benefits are some of the response plans that catered to individuals. These response plans provide support to those who lost their jobs and help to ensure continuity in economic activities. According to the World

Bank, final consumption expenditure made up 78.95% of Canada's GDP in 2019. So, the decline in final consumption expenditure in 2020 is a big hit to Canada's GDP. Based on the findings of this paper, it would be imperative to create measures that will increase consumption when creating policies that would boost the economy.

The main limitation to this study was the lack of daily data for Canada's final consumption expenditure which resulted in the use of an average daily final consumption expenditure. The use of real time daily data would have created a more accurate estimate compared to an average daily final consumption expenditure.

References

Achou, Bertrand, David Boisclair, Philippe D'astous, Raquel Fonseca, Franca Glenzer, and Pierre-Carl Michaud. *Snapshot of Households That Received the Canada Emergency Response Benefit and Paths for Further Investigation*. CIRANO, 2020.

Ali, Bayad. "Impact of COVID-19 on Consumer Buying Behavior Toward Online Shopping in Iraq." *Impact of COVID-19 on consumer buying behavior toward online shopping in Iraq. Economic Studies Journal* 18, no. 42 (2020): 267-280.

Andersen, Asger Lau, Emil Toft Hansen, Niels Johannesen, and Adam Sheridan. "Pandemic, shutdown and consumer spending: Lessons from Scandinavian policy responses to COVID-19." *arXiv preprint arXiv:2005.04630* (2020).

Baker, Scott R., Robert A. Farrokhnia, Steffen Meyer, Michaela Pagel, and Constantine Yannelis. "How does household spending respond to an epidemic? Consumption during the 2020 COVID-19 pandemic." *The Review of Asset Pricing Studies* 10, no. 4 (2020): 834-862.

Blit, Joel. *Is increasing productivity COVID-19's silver lining?*. Econstor No. 30. Working Paper Series, University of Waterloo, 2020.

Bryant, Toba, Scott Aquanno, and Dennis Raphael. "Unequal Impact of COVID-19: Emergency Neoliberalism and Welfare Policy in Canada." *Critical Studies: An International and Interdisciplinary Journal* 15, no. 1 (2020): 22-39.

Chen, Haiqiang, Wenlan Qian, and Qiang Wen. *The impact of the COVID-19 pandemic on consumption: Learning from high frequency transaction data*. Available at SSRN 3568574 (2020).

Chetty, Raj, John Friedman, Nathaniel Hendren, and Michael Stepner. *How did covid-19 and stabilization policies affect spending and employment? a new real-time economic tracker based on private sector data*. National Bureau of Economic Research working paper w27431 (2020).

Coibion, Olivier, Yuriy Gorodnichenko, and Michael Weber. *The cost of the covid-19 crisis: Lockdowns, macroeconomic expectations, and consumer spending*. National Bureau of Economic Research working paper w27141 (2020).

Ganong, Peter, and Pascal Noel. *How does unemployment affect consumer spending?*. Unpublished manuscript, Harvard Univ., Cambridge, MA, 2015.

Government of Canada. *Canada's COVID-19 Economic Response Plan: Support for Canadians and Businesses*. Last modified: March 18, 2020. https://www.canada.ca/en/department-finance/news/2020/03/canadas-covid-19-economic-response-plan-support-for-canadians-and-businesses.html.

Guzman, Debnam, Jakina, Marie Christelle Mabeu, and Roland Pongou. *Identity During a Pandemic: COVID-19 and Ethnic Divisions in the United States*. Working paper #2101E, Department of Economics, University of Ottawa. (2021).

Malley, Jim, and Thomas Moutos. "Unemployment and consumption." *Oxford Economic Papers* 48, no. 4 (1996): 584-600.

Miller, Thomas R., and Tiffany A. Radcliff. "Economic Shocks From the Novel Coronavirus Disease 2019 Pandemic for Anesthesiologists and Their Practices." *Anesthesia and Analgesia* (2020).

Mody, Ashoka, Franziska Ohnsorge, and Damiano Sandri. "Precautionary savings in the great recession." *IMF Economic Review* 60, no. 1 (2012): 114-138.

Pongou, Roland, Guy Tchuente, and Jean-Baptiste Tondji. "An Economic Model of Health-vs-Wealth Prioritization during COVID-19: Optimal Lockdown, Network Centrality, and Segregation." *Network Centrality, and Segregation (September 19*, 2020).

Prime Minister of Canada. *Prime Minister announces new actions under Canada's COVID-19 response*. March 16, 2020. https://pm.gc.gc.ca/en/news/news-releases/2020/03/16/prime-minister-announces-new-actions-under-canadas-covid-19-response.

Robson, Jennifer. "Radical Incrementalism and Trust in the Citizen: Income Security in Canada in the Time of COVID-19." *Canadian Public Policy* 46, no. S1 (2020): S1-S18.

Statista. *Number of confirmed coronavirus (COVID-19) cases in Canada as of March 30, 2021, by province or territory*. https://www.statista.com/statistics/1107066/covid19-confirmed-cases-by-province-territory-canada/.

Statistics Canada. *Labour Force Survey*, April 2020. May 18, 2020. https://www150.statcan.gc.ca/n1/daily-quotidien/200508/dq200508a-eng.htm.

Statistics Canada. *Population estimates, quarterly*. April 08, 2020. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1710000901.

World Bank. *Final consumption expenditure (% of GDP) – Canada*. https://data.worldbank.org/indicator/NE.CON.TOTL.ZS?end=2019&locations=CA&start=1961&view=chart.

The Conference Board of Canada. *E-Data*. https://www.conferenceboard.ca/e-data/metadata.aspx.

World Health Organisation (WHO). *WHO Director-General's opening remarks at the media briefing on COVID-19 - 11 March 2020*. https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020.

Appendix

Fig 1 Canada Household Final Consumption Expenditure

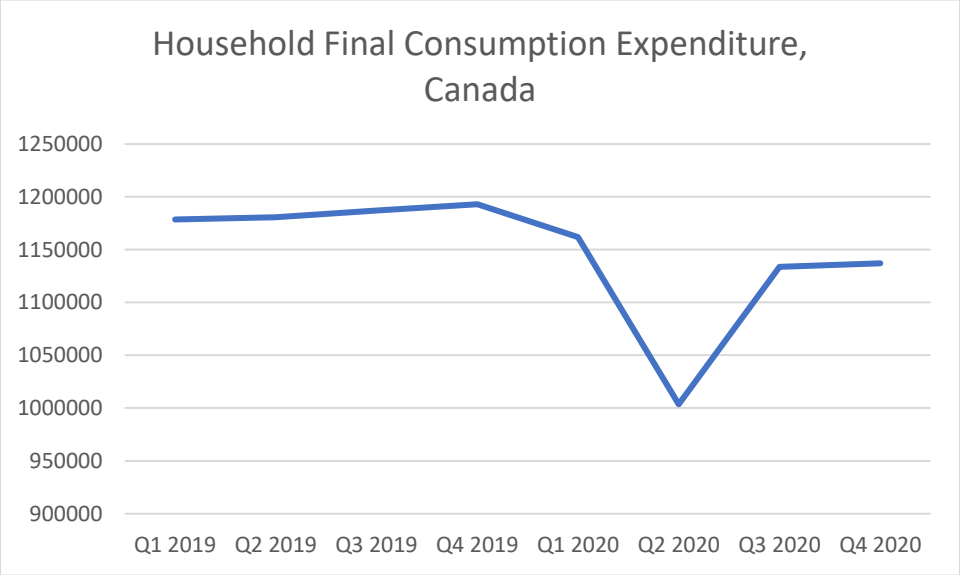

Fig 2 Household final consumption expenditure of the five most populated provinces

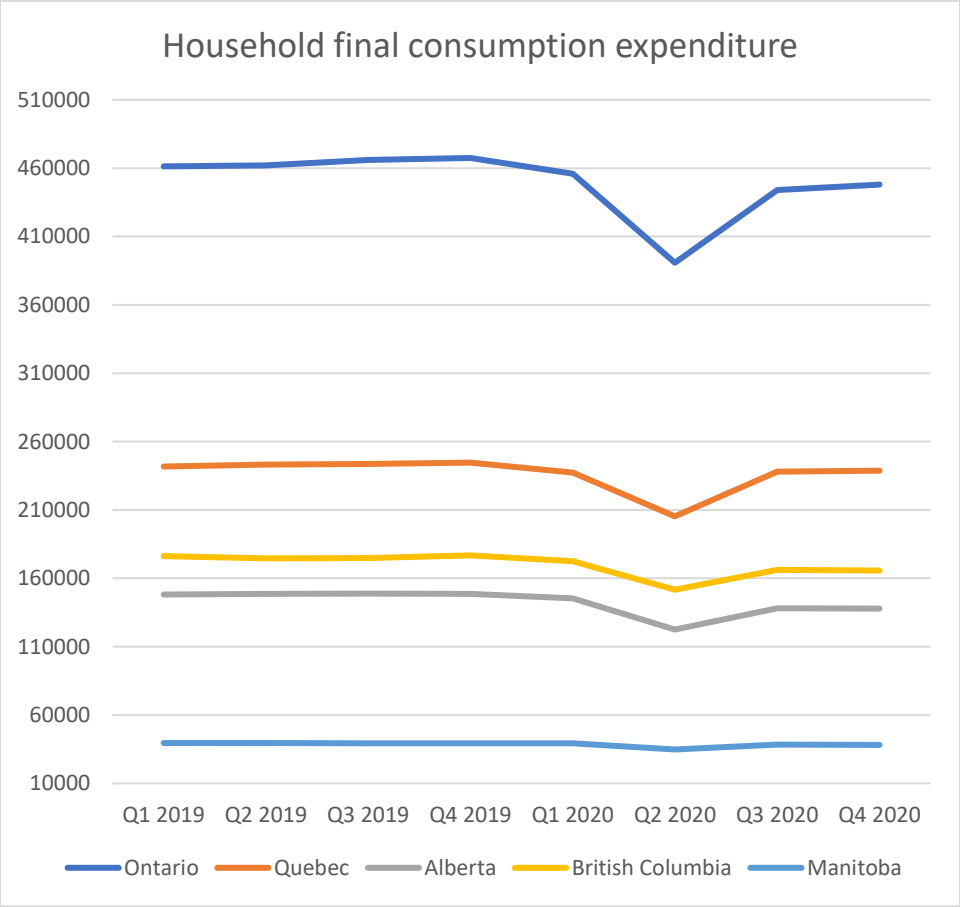

Fig 3 Household final consumption expenditure of the least populated provinces

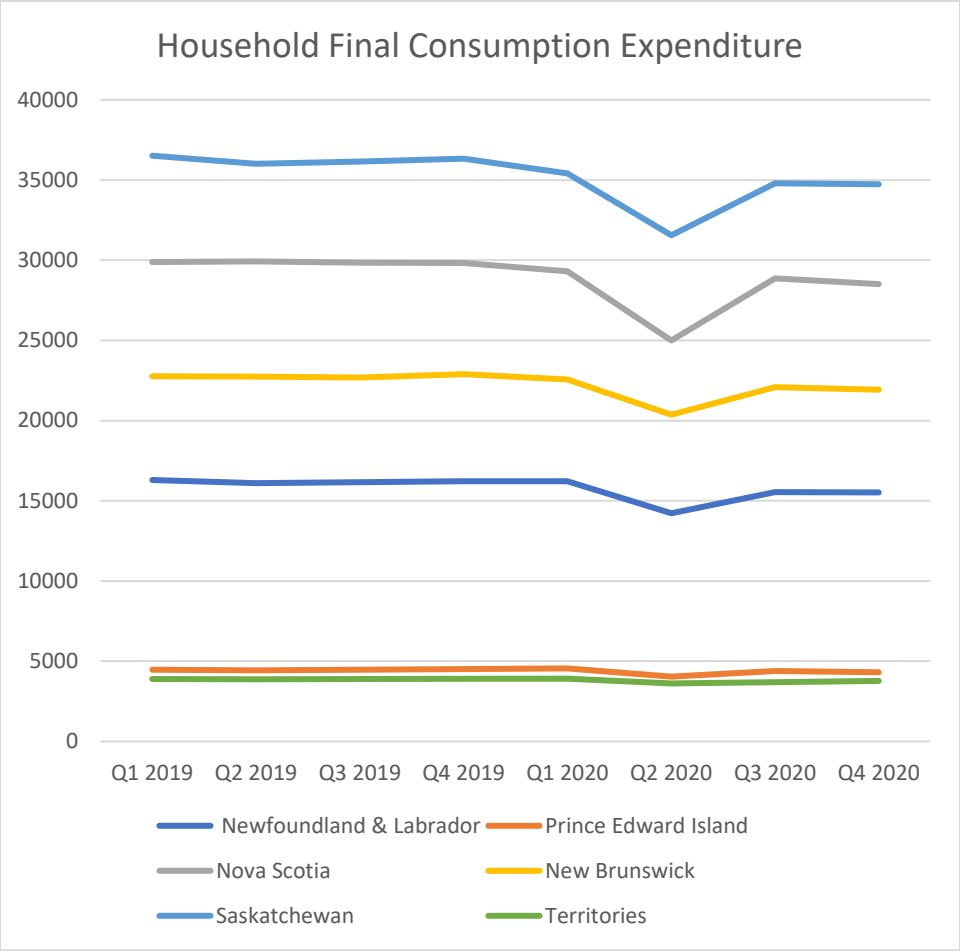

Fig 4 Household final consumption expenditure of the goods category of consumption

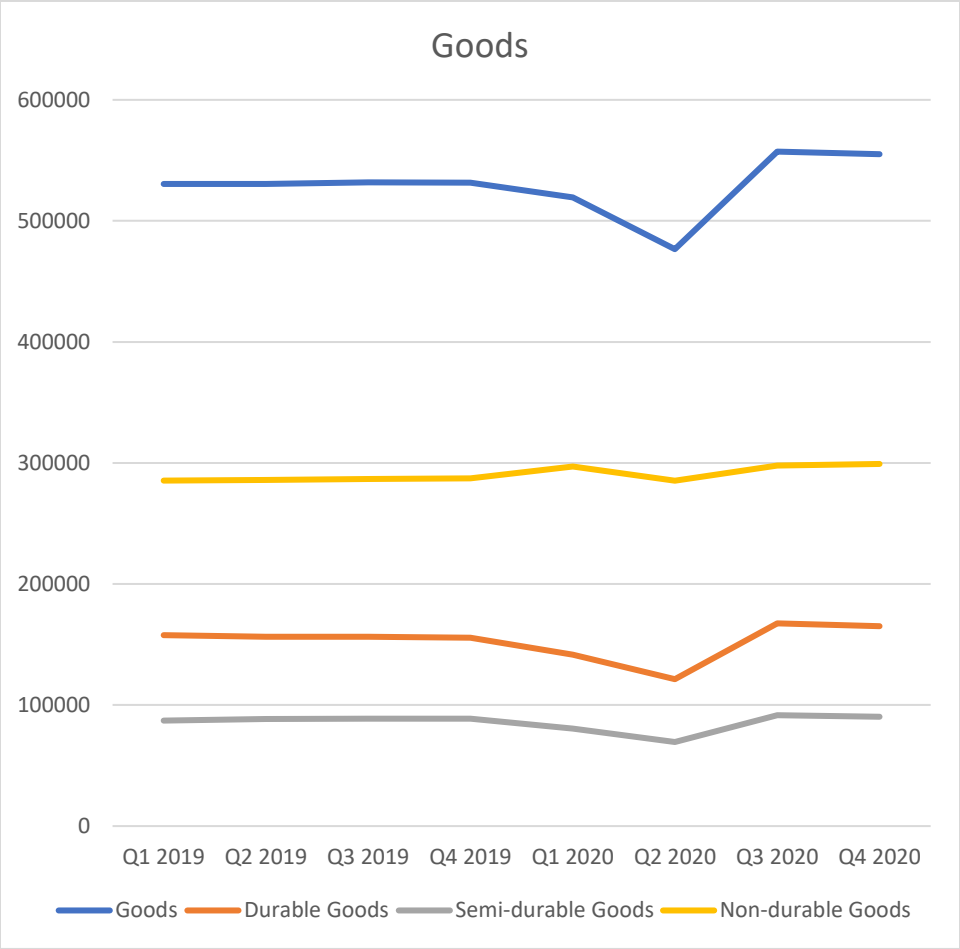

Fig 5 Household final consumption expenditure of the services category of consumption

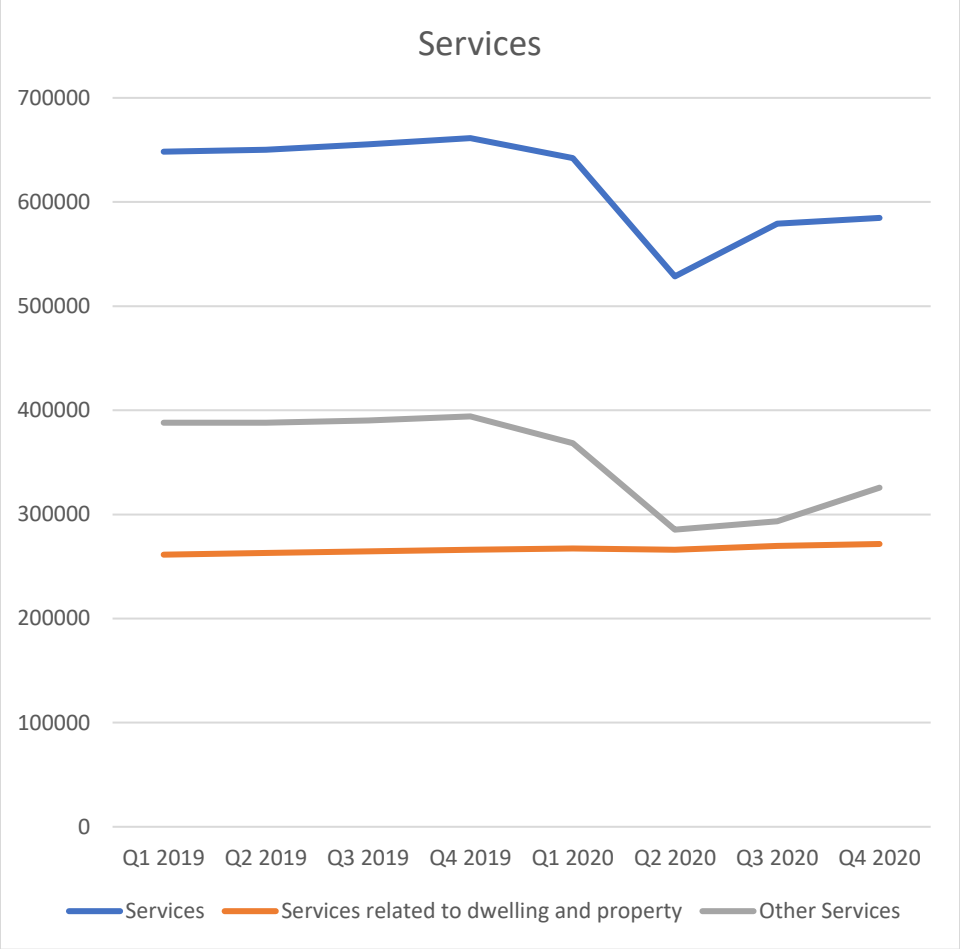

Table 1. **OLS estimates for average daily household total consumption in Canada**

VARIABLES	(1) lnCan	(2) lnCan
pcovid	-0.0132**	-0.0132***
	(0.00514)	(0.00396)
plockdown	-0.0722***	-0.0722***
	(0.00526)	(0.00490)
Constant	9.471***	9.471***
	(0.00215)	(0.00144)
Observations	731	731
R-squared	0.499	0.499
F-Stat	362.5	291.6
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 2. OLS estimates for average daily household total consumption in Ontario

VARIABLES	(1) lnOntario	(2) lnOntario
pcovid	-0.0116**	-0.0116***
	(0.00540)	(0.00396)
plockdown	-0.0740***	-0.0740***
	(0.00552)	(0.00506)
Constant	8.534***	8.534***
	(0.00225)	(0.00143)
Observations	731	731
R-squared	0.476	0.476
F-Stat	331.3	260.7
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3. OLS estimates for average daily household total consumption in Quebec

VARIABLES	(1) lnQuebec	(2) lnQuebec
pcovid	-0.0187***	-0.0187***
	(0.00587)	(0.00396)
plockdown	-0.0540***	-0.0540***
	(0.00600)	(0.00534)
Constant	7.888***	7.888***
	(0.00245)	(0.00144)
Observations	731	731
R-squared	0.352	0.352
F-Stat	197.6	159
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 4. OLS estimates for average daily household total consumption in Alberta

VARIABLES	(1) lnAlberta	(2) lnAlberta
pcovid	-0.0154***	-0.0154***
	(0.00511)	(0.00397)
plockdown	-0.0983***	-0.0983***
	(0.00522)	(0.00487)
Constant	7.395***	7.395***
	(0.00213)	(0.00146)
Observations	731	731
R-squared	0.643	0.643
F-Stat	654.7	527.9
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 5. OLS estimates for average daily household total consumption in British Columbia

VARIABLES	(1) lnBritishColumbia	(2) lnBritishColumbia
pcovid	-0.0110**	-0.0110***
	(0.00434)	(0.00399)
plockdown	-0.0771***	-0.0771***
	(0.00444)	(0.00441)
Constant	7.562***	7.562***
	(0.00181)	(0.00151)
Observations	731	731
R-squared	0.600	0.600
F-Stat	546.4	483.4
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 6. OLS estimates for average daily household total consumption in Manitoba

VARIABLES	(1) lnManitoba	(2) lnManitoba
pcovid	0.00352	0.00352
	(0.00442)	(0.00399)
plockdown	-0.0663***	-0.0663***
	(0.00452)	(0.00445)
Constant	6.068***	6.068***
	(0.00185)	(0.00152)
Observations	731	731
R-squared	0.437	0.437
F-Stat	282.6	244.7
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 7. OLS estimates for average daily household total consumption in Saskatchewan

VARIABLES	(1) lnSaskatchewan	(2) lnSaskatchewan
pcovid	-0.0171***	-0.0171***
	(0.00448)	(0.00400)
plockdown	-0.0594***	-0.0594***
	(0.00458)	(0.00447)
Constant	5.984***	5.984***
	(0.00187)	(0.00155)
Observations	731	731
R-squared	0.509	0.509
F-Stat	377	333.4
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 8. OLS estimates for average daily household total consumption in Nova Scotia

VARIABLES	(1) lnNovaScotia	(2) lnNovaScotia
pcovid	-0.0124**	-0.0124***
	(0.00564)	(0.00398)
plockdown	-0.0752***	-0.0752***
	(0.00577)	(0.00517)
Constant	5.791***	5.791***
	(0.00235)	(0.00150)
Observations	731	731
R-squared	0.466	0.466
F-Stat	317.6	249.2
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 9 OLS estimates for average daily household total consumption in New Brunswick

VARIABLES	(1) lnNewBrunswick	(2) lnNewBrunswick
pcovid	-0.00239	-0.00239
	(0.00397)	(0.00398)
plockdown	-0.0598***	-0.0598***
	(0.00406)	(0.00423)
Constant	5.519***	5.519***
	(0.00166)	(0.00149)
Observations	731	731
R-squared	0.478	0.478
F-Stat	333.2	310.3
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 10. OLS estimates for average daily household total consumption in Newfoundland

VARIABLES	(1) lnNewfoundland	(2) lnNewfoundland
pcovid	0.00782*	0.00782*
	(0.00432)	(0.00400)
plockdown	-0.0802***	-0.0802***
	(0.00442)	(0.00439)
Constant	5.179***	5.179***
	(0.00180)	(0.00154)
Observations	731	731
R-squared	0.524	0.524
F-Stat	401	353.4
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 11. OLS estimates for average daily household total consumption in Prince Edward Island

VARIABLES	(1) lnPEI	(2) lnPEI
pcovid	0.0245***	0.0245***
	(0.00397)	(0.00397)
plockdown	-0.0777***	-0.0777***
	(0.00406)	(0.00424)
Constant	3.891***	3.891***
	(0.00166)	(0.00147)
Observations	731	731
R-squared	0.458	0.458
F-Stat	307.7	277.2
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12. OLS estimates for average daily household total consumption in the Territories

VARIABLES	(1) lnTerritories	(2) lnTerritories
pcovid	0.0104***	0.0104***
	(0.00332)	(0.00398)
plockdown	-0.0644***	-0.0644***
	(0.00340)	(0.00391)
Constant	3.752***	3.752***
	(0.00139)	(0.00148)
Observations	731	731
R-squared	0.518	0.518
F-Stat	391.7	432.9
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 13. OLS estimates for average daily household total consumption for goods category of consumption

VARIABLES	(1) lnGoods	(2) lnGoods
pcovid	-0.0155**	-0.0155***
	(0.00606)	(0.00397)
plockdown	0.00475	0.00475
	(0.00619)	(0.00544)
Constant	8.669***	8.669***
	(0.00253)	(0.00147)
Observations	731	731
R-squared	0.015	0.015
F-Stat	5.726	9.733
Prob > F	0.00341	6.74e-05
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 14 OLS estimates for average daily household total consumption for non-durable goods

VARIABLES	(1) lnNonDurableGoods	(2) lnNonDurableGoods
pcovid	0.0431***	0.0431***
	(0.00328)	(0.00397)
plockdown	-0.0210***	-0.0210***
	(0.00336)	(0.00391)
Constant	8.051***	8.051***
	(0.00137)	(0.00145)
Observations	731	731
R-squared	0.238	0.238
F-Stat	113.5	97.37
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 15. OLS estimates for average daily household total consumption for durable goods

VARIABLES	(1) lnDurableGoods	(2) lnDurableGoods
pcovid	-0.0932***	-0.0932***
	(0.0116)	(0.00401)
plockdown	0.0416***	0.0416***
	(0.0118)	(0.00911)
Constant	7.447***	7.447***
	(0.00482)	(0.00158)
Observations	731	731
R-squared	0.111	0.111
F-Stat	45.42	279.1
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 16. OLS estimates for average daily household total consumption for semi-durable goods

VARIABLES	(1) lnSemiDurableGoods	(2) lnSemiDurableGoods
pcovid	-0.0858***	-0.0858***
	(0.00991)	(0.00395)
plockdown	0.0204**	0.0204**
	(0.0101)	(0.00801)
Constant	6.874***	6.874***
	(0.00414)	(0.00142)
Observations	731	731
R-squared	0.167	0.167
F-Stat	73.04	263.6
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 17. OLS estimates for average daily household total consumption for the service category of consumption

VARIABLES	(1) lnServices	(2) lnServices
pcovid	-0.0113**	-0.0113***
	(0.00475)	(0.00396)
plockdown	-0.135***	-0.135***
	(0.00486)	(0.00469)
Constant	8.877***	8.877***
	(0.00198)	(0.00143)
Observations	731	731
R-squared	0.778	0.778
F-Stat	1278	1047
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 18 OLS estimates for average daily household total consumption for services relating property

VARIABLES	(1) lnSerProperty	(2) lnSerProperty
pcovid	0.0200***	0.0200***
	(0.00303)	(0.00396)
plockdown	-0.00549*	-0.00549
	(0.00310)	(0.00381)
Constant	7.969***	7.969***
	(0.00127)	(0.00142)
Observations	731	731
R-squared	0.099	0.099
F-Stat	40.04	39.40
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 19. OLS estimates for average daily household total consumption for other services

VARIABLES	(1) lnOtherservices	(2) lnOtherservices
pcovid	-0.0511***	-0.0511***
	(0.00604)	(0.00396)
plockdown	-0.203***	-0.203***
	(0.00617)	(0.00544)
Constant	8.360***	8.360***
	(0.00252)	(0.00145)
Observations	731	731
R-squared	0.864	0.864
F-Stat	2308	1806
Prob > F	0	0
Degree of Freedom	728	728

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1