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Canadian Household Consumption Expenditure
(2019 Q1 – 2023 Q3)

Introduction

My initial idea for this project was born from a simple desire: to explore an aspect reflective of Canadian daily life. Initially, I intended to use Tableau to create a map detailing the locations of electric vehicle charging stations. However, as I delved deeper, I found that such maps already existed and served their purpose well. Then it was at this juncture that an article titled "RBC Consumer Spending Tracker"(Freestone, 2024) captured my attention, revealing not just numbers, but the highlights of holiday spending surges and trends in in-person shopping. Intrigued by data that shed light on the daily expenditures of Canadians, I decided this was the domain I wanted to explore, aiming to unravel the narrative embedded within Canadian spending patterns.

Data

There is no better website than Statistics Canada to get the most authoritative dataset. Entitled "Detailed household final consumption expenditure by product, quarterly," and sourced from Statistics Canada under CANSIM number 380-0085 (Statistics Canada, 2023), this dataset encapsulates the financial pulse of the Canadian consumption spectrum over the past five years, from 2019 to 2023. As I intend to provide only an overview, I chose to use quarterly data, limiting the categories to cover the top 10 percent of the total final expenditure.

From the website, I downloaded two Excel sheets: one contains the chronicles of expenditures, while the second sheet contains its metadata, which elucidates the structure behind the figures. Below is a brief description of the data's key variables. Most importantly, the "category," which categorizes spending into realms like Food, Clothing, and Electricity. Variables 'Year' and 'Quarters' anchor each figure in time, and 'Value' conveys the total expenditure. First, the most important one: "category", which categorize spending into realms like Food, Clothing, and Electricity. The temporal variables 'Year' and 'Quarters' anchor each figure in time, and the 'Value' conveys the total expenditure. Joined with the metadata sheet, two additional variables were introduced. 'Parent ID' and 'Member ID' unveil the familial ties between categories, such as 'Food' being nested under the broader 'Food and non-alcoholic 'Food and non-alcoholic beverages'.

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Reflection on Self-Learning

Benefiting with a student account, I received a full year of Tableau study resources. After browsing through some examples provided by the Tableau website, I started with the basics, watching beginner videos on YouTube that explained data manipulation and simple visualization creation. Having some experience with Microsoft Power BI, I quickly dove into the software and began assembling simple visualizations. Whenever I

encountered a problem, I searched for solutions online, often finding answers in the Tableau community forums.

I also discovered Tableau Prep, which revolutionized my approach to data cleaning and preparation. Initially, I struggled to clean data directly in Tableau Desktop, which was not the proper tool for data preparation. When I almost reverted to using Excel Power Query for data cleaning, a conversation with a classmate led me to realize that Tableau Prep was the right tool for the job. This experience taught me the importance of discussion and community. If I were to start again, I would engage more with my peers and the community from the beginning.

In summary, the iterative loop of watch, practice, and seek feedback worked well for me. It made me agile with Tableau and boosted my confidence in my skills. Going forward, I will continue to utilize this iterative loop and carry the lesson that engaging with the community is invaluable when self-studying.

Data Visualization

Based on the nature of the dataset, I designed two visualizations to answer two questions that users might be most interested in: 1. What are the top 10 categories that cover the most consumption expenditure? 2. What is the trend in consumption expenditure over the last five years?

Visualization 1: Expenditure Breakdown by Category

The first visualization, a bubble chart, intuitively showcases the distribution of household expenses across different categories. Each bubble's size corresponds to the total spending within a category, providing an at-a-glance understanding of where Canadians are allocating their funds. The 'Transport' category, depicted as the second largest bubble, signals a significant portion of household budgets, likely encompassing costs like vehicle maintenance, fuel, and commuting expenses. Similarly, the bubble for 'Housing, water, electricity, gas, and other fuels' is prominent, reflecting considerable spending on essential home needs.

This visualization is not just about presenting data; it is about highlighting priorities. For clients in the policy domain or retail sector, such a visual act as a guide to where Canadian households are focusing their financial resources, which can inform strategic decisions, budget allocations, and policy formulations.

The model began with adjusting the bubbles' sizes to reflect the total expenditure of each category. To present the visualization clearly, I used the filter function to display only the main categories that have the top 10 highest expenditures. The bubbles are color-coded by different categories so users can easily distinguish them.

The limitations of this visualization are apparent, as users might find it difficult to clearly distinguish between two bubbles when they are of similar size. Although users can use tooltips to find the exact value of each category, a PDF file will not be able to show these

numbers at first glance. Additionally, another limitation of this visualization is that it cannot contain too many categories to avoid cluttering the view with many small bubbles.

Visualization 2: Quarterly Expenditure Trends Over Years
The second visualization, a bar chart, tracks the quarterly expenditure trends over five years. This longitudinal analysis reveals seasonal and annual patterns in spending behavior. For instance, one might observe a consistent increase in spending during Q4, indicative of the holiday shopping season's impact. Conversely, anomalies or dips could indicate economic events affecting consumer confidence. For example, Q2 of 2020 had the lowest total expenditure, which might be the result of the pandemic's impact. Then, starting in Q3 of 2023, the total expenditure began to increase quarterly with a significant speed compared to the years of 2019 and 2020, which might be related to post-pandemic inflation. Each year the total expenditure is increasing, and each quarter shows a similar trend.

For the user, this visualization serves as a forecasting and planning tool. Understanding these trends enables businesses to align their sales strategies with anticipated peaks in consumer spending. It also assists economists and policymakers in assessing the economy's health and the effectiveness of fiscal measures over time.

The model introduces 'Quarters' and 'Year' into the Columns field and positions the total expenditure summary in the Rows. To better observe the trend and compare each quarter through the years, each year was labeled with a different color. As the final visualization is presented within a PDF file, the exact numbers for total expenditure/value are annotated.

The limitations of this model are clear, as a bar chart is ideal for comparison across the years but lacks the continuous trend line that is the advantage of line charts.

In general, these visualizations together provide a comprehensive view of Canadian consumer behavior. This dual perspective is essential in developing targeted marketing campaigns, designing customer engagement strategies, and predicting market demands. While there are limitations—such as the absence of Q4 data for 2023 and the focus on the top expenditure categories—the analysis is robust and based on the comprehensive data provided by Statistics Canada. The dataset from Statistics Canada is extensive but may not fully represent consumer behavior across all demographics. 'Parent ID' and 'Member ID' in the metadata categorize expenditures hierarchically. There might be some overlap across categories for certain expenditures.

Conclusions & Recommendations
The visualizations highlight two significant areas of Canadian household spending: transportation and housing utilities, which dominate the budget landscape. Transportation, as the second largest expenditure category, suggests opportunities for policies promoting public transit and fuel-efficient vehicles could provide substantial relief to household budgets. The increase in housing-related costs over the years calls for targeted initiatives,

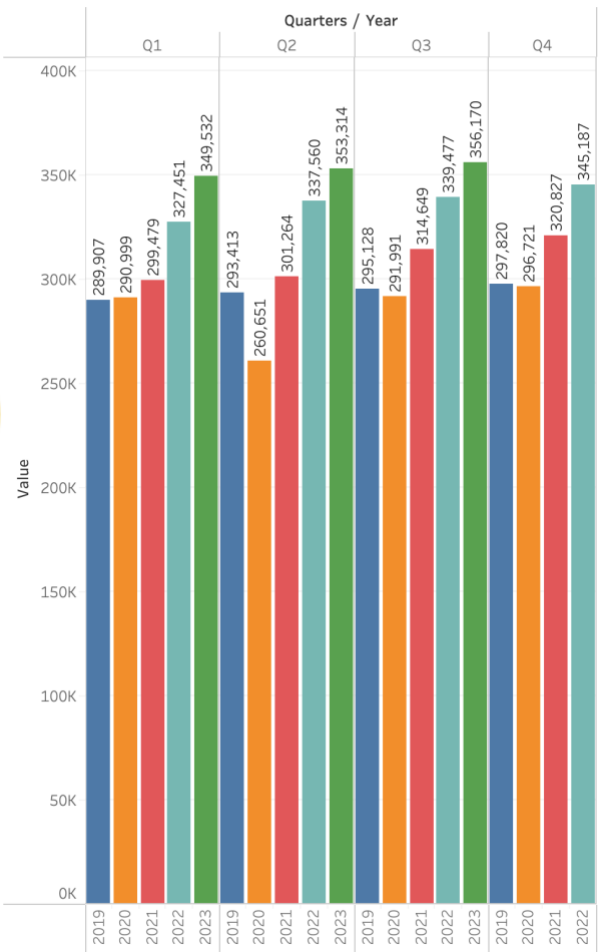such as energy-saving programs and affordable housing strategies, to help reduce these essential expenses.

Quarterly trends reveal the impact of seasonal spending, with Q4 consistently showing a spike likely due to the holiday season. Retailers could capitalize on this by aligning marketing strategies to this period. The dip in Q2 of 2020, coinciding with the pandemic onset, indicates an area for economic analysis on consumer behavior under crisis conditions.

Post-pandemic spending patterns, with a notable increase from Q3 of 2023, suggest inflationary pressures are at play, highlighting the need for measures that support consumer purchasing power and price stabilization.

Visual 1: Expenditure Breakdown by Category

Category
- ■ Alcoholic beverages, tobacco and cannabis
- ■ Clothing and footwear
- ■ Food and non-alcoholic beverages
- ■ Furnishings, household equipment and other goods and services related to the dwelling
- ■ Health
- ■ Housing, water, electricity, gas and other fuels
- ■ Insurance and financial services
- ■ Miscellaneous goods and services
- ■ Recreation and culture
- ■ Transport

Visual 2: Quarterly Expenditure Trends Over Years

Year
- ■ 2019
- ■ 2020
- ■ 2021
- ■ 2022
- ■ 2023

References

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