

Examining the Impact of Economic Recession on Household Charitable Donations in Canada

GECON 7201 TERM PAPER

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1. Introduction

Charities are unique organizations, which have similarities and differences with both the public and private sectors. Specifically, charities are not profit-driven organizations which sell goods and services, like a private company. Rather than profits, charities are purpose-driven organizations that “must use their resources for charitable activities and have charitable purposes,”¹ of which there are multiple categories. Similarly, while charities are often seen as a public good, they do not have the power to levy taxation for redistribution, like government. Due to their unique nature, charities are granted special considerations by the Canada Revenue Agency (CRA), specifically, “A registered charity is issued a Registration Number once approved. It is exempt from paying income tax and can issue tax receipts for donations it receives.”² Due to their purpose-driven focus and the CRA’s rules surrounding them, private donations are the primary revenue source for most charities.

The charitable industry in Canada is large relative to the overall Canadian economy. Imagine Canada estimates that “charities and nonprofits contribute \$192 billion dollars in economic activity to Canada annually, and account for 8.3% of our country’s GDP,” and employs approximately 2.4 million people.³ This is significant, especially when considering the fact that the industry is reliant on private donations in order to continue their operations, it is worth exploring whether consumers will significantly change their donation behaviours based on their beliefs about their overall economic outlook.

¹ <https://www.canada.ca/en/revenue-agency/services/charities-giving/giving-charity-information-donors/about-registered-charities/what-difference-between-a-registered-charity-a-non-profit-organization.html>

² <https://www.canada.ca/en/revenue-agency/services/charities-giving/charities/charities-giving-glossary.html>

³ <https://www.imaginecanada.ca/en/About-the-sector#:~:text=Our%20sector%20is%20an%20economic,or%20agriculture%2C%20transportation%20and%20retail>

Donations made to charities by individuals would typically be considered discretionary because it is not a necessity the same way that food and shelter is. Further to this, it is not unreasonable to assume that as a consumer's perception of economic uncertainty increases, their likelihood to donate to charity, along with the amount they donate, may both decrease. In this way, charitable donations are reliant on consumers being confident enough in their economic future to spend money on strangers, via their charitable donations.

Using consumer financial data, I intend to test the hypothesis that during times of economic recession, consumers donate less to charity.

Background

At the time of this writing, there are many traditional indications that the Canadian economy is possibly heading toward a recession. There has been inflation that is higher than the targeted 2%⁴, as a result the Bank of Canada has been raising interest rates⁵, and there have been well-publicized layoffs⁶. As this happens it is important for charities to understand and prepare for any impact it may have on their revenue and ability to deliver the services community members rely on.

During the Great Recession, roughly late 2007 to mid-2009⁷, the economies of virtually all developed nations went through a recession, Canada included. The severity varied from individual to individual but overall, the stock markets contracted, and unemployment rates in Canada rose. Using data related to household spending and examining research into consumer

⁴ <https://www150.statcan.gc.ca/n1/daily-quotidien/221116/t001a-eng.htm>

⁵ <https://www.bankofcanada.ca/core-functions/monetary-policy/key-interest-rate/>

⁶ <https://globalnews.ca/news/9145736/more-layoffs-ahead-for-canadian-tech-sector-elevate-conference-speakers-warn/>

⁷ <https://www.bankofcanada.ca/wp-content/uploads/2011/03/sp280311.pdf>

behaviour during this time, I will attempt to answer the question of if donations to charities were negatively impacted.

Literature Review

Based on my review, there has not been much published research directly related to consumers charitable donation habits in general, let alone during economic recession. However, there is research that has been done regarding consumer habits and preferences during times of recession, and that is primarily the research I relied on. Additionally, there is some work that has been published regarding consumer habits and charitable giving which was also helpful for the analysis.

Economic recessions have significant impact on consumers as explored by Sarmiento et al in their 2019 paper “Consumption Dynamics during Recession and Recovery: A Learning Journey” which examines the effects of a Portuguese recession and recovery, through data obtained in 2014 and 2018. According to the authors during the recession, “Consumers learned to be more rational and more spared,” (Sarmiento 2019) which implies a greater scrutiny on expenses than prior to the recession. Not only that, but through interviews they found that consumers were not planning to resume their pre-recession consumption habits, but instead maintain their more mindful spending learned during the recession through the recovery and beyond. While it should be noted that this is based on consumers predicting their own habits in the future, it could also mean that not only would an economic recession impact charitable donations at that point in time, but there could be lasting effects, as well.

Interestingly, however, they also reported that, “Consumers referred to the increased social responsibility associate with the economic recession,” (Sarmiento 2019). The context

added to this statement uses examples that are more directly related to consumption, such as buying less to reduce waste and not pouring clean water into the sewer pipe, it is possible that this sense of social responsibility would extend beyond their daily consumption and benefit charities, but studying that effect is beyond the scope of this paper.

Similarly, Puelles, Diaz-Bustamante and Carcelén outline that during times of economic crisis not only are there consumer behaviour changes, but lasting changes. While focusing on retail purchases, the authors contest that the changes made by consumers could be considered them making “more rational” choices. (Puelles et al., 2016) While this study does not fully capture all household finances, it provides insight to the changes in consumption behaviour of consumers during recession.

While determining what a good recession indicator would be, that consumers would be aware of at the time and determined that the unemployment rate was the best option. This is because it is reported regularly and covered widely, especially when there are significant changes. According to a study done of Google searches during the early months of the COVID-19 pandemic (March 2020) there was a notable increase in searches related to “unemployment” (Sotis 2021). I take this as an indication that it is top of mind for people when there is economic uncertainty, like during times of recession.

Summary Results

Through analysis of the Survey of Household Spending for the years 2007 and 2009, as well as the use of Ordinary Least Squares regressions I find evidence that there is a possibility that households in Canada reduced their charitable donations during the Great Recession. However, testing of the models indicates that more work needs to be done on their functional

forms and variable identification. Since this is a preliminary study, the results are compelling enough to warrant further research into this area in the future, with the possibility of inspiring additional research questions, such as whether a change in economic outlook has a greater effect than an actual household income change.

2. Conceptual Framework

Since this is an area with little published research, I decided to test several functional forms using simple Ordinary Least Squares models. The reason for this was primarily to explore whether there is any evidence that points to a meaningful effect that an economic recession has on household donations, ideally being able to quantify the impact. This involves using different control variables to indicate the recession and understand the impact.

The data being used is a random sampling of Canadians, satisfying SLR.2 of OLS estimates, and the number of observations is large enough to assume it is representative of the Canadian population. All the independent variables are unrelated to one another, and a zero-conditional mean of the error terms can be assumed. Testing the models for being correctly specified and for omitted variables is important. (Wooldridge 2020) Having not found any previous published regressions related to charitable giving, it is likely that even if the models produce significant results, they are not correctly specified. Decisions related to personal finance are complicated and capturing that complexity in a model can be difficult.

I chose the years 2007 and 2009 to compare based on the unemployment rates during those years. While there are several indicators of recession, unemployment rate and the performance of the stock market are likely the two most visible to everyday consumers. While the stock market was also depressed at the time, unemployment rate provided a simple,

quantifiable measure and as previously mentioned shown to be of concern to consumers during economic recession (Sotis 2021).

3. Empirical Methods

In testing the hypothesis that economic recession has a negative impact on charitable giving, I used four functional forms in order to see which would be best specified. Since unemployment rate is an economic indicator and does not affect everyone in the economic uniformly (either someone loses their job or they don't) my assumption is that it would have a diminishing effect and used the squared term to test this. The first two forms use both year and provincial dummies to determine the effect of the recession and control for other provincial-specific factors, respectively. I regressed these variables in both a straight linear function, as well as a log-log form:

$$donations_{it} = \beta_0 + \beta_1 houseinc_{it} + \delta_1 y2009 + \gamma Z_{it} + \beta_2 ProvUnem_{it} + \beta_3 ProvUnem_{it}^2 + u_{it} \quad (3.1)$$

$$\log(donations_{it}) = \beta_0 + \beta_1 \log(houseinc_{it}) + \beta_2 \log(housinc_{it}) \cdot y2009 + \delta_1 y2009 + \gamma Z_{it} + u_{it} \quad (3.2)$$

donations_{it}: The dollar amount of charitable donations reported by a household.

houseinc_{it}: Household income

y2009: Binary dummy variable indicating year.

Z_{it}: A vector of dummy variables indicating province, with Manitoba used as the base province.

ProvUnem_{it}: The unemployment rate in the province of the observation that year

Additionally, I again used a straight linear and a log-log model using provincial unemployment rate as a control, and with an interactive variable between income a year is specified to measure effect in the log-log form.

$$donations_{it} = \beta_0 + \beta_1 houseinc_{it} + \delta_1 y2009 + \beta_2 ProvUnem_t + \beta_3 ProvUnem_t^2 + u_{it} \quad (3.3)$$

$$\log(donations_{it}) = \beta_0 + \beta_1 \log(houseinc_{it}) + \delta_1 y2009 + \beta_2 ProvUnem_{it} + \beta_3 ProvUnem_{it}^2 + u_{it} \quad (3.4)$$

donations_{it}: The dollar amount of charitable donations reported by a household.

houseinc_{it}: Household income

y2009: Binary dummy variable indicating year.

ProvUnem_{it}: The unemployment rate in the province of the observation that year.

Since consumer behaviour, especially related to personal finance, is complicated, I tested the functional form for misspecification using Ramsey's (1969) regression specification error test (RESET), which according to Wooldridge (2020) is a useful test for general form misspecification. Specifically, it tests whether the response variable can be at least partially explained with non-linear combinations of the fitted values and more generally can indicate the possibility of omitted variables.

4. Data

The primary data sources used for this analysis is The Survey of Household Spending, collected by Statistics Canada, which is a national survey which, "gathers information on the spending habits of Canadians. It looks at how much households pay for food, clothing, shelter,

transportation, health care and other items.”⁸ For the analysis the datasets from years 2007 and 2009 are used, which include 13,013 and 9,825 entries respectively used in my analysis, distributed across all Canadian provinces and territories. It is a cross-sectional survey, so there is no way to determined how individual respondent’s income or behaviour changed due to the recession. The below table shows the number of responses per province:

Table 4.1: Survey Responses

| <i>Province</i> | 2007 | 2009 |
|----------------------------------|-------------|-------------|
| <i>Canada</i> | 13013 | 9825 |
| <i>Newfoundland and Labrador</i> | 1236 | 978 |
| <i>Prince Edward Island</i> | 578 | 492 |
| <i>Nova Scotia</i> | 1178 | 897 |
| <i>New Brunswick</i> | 1223 | 927 |
| <i>Quebec</i> | 1661 | 1275 |
| <i>Ontario</i> | 1706 | 1486 |
| <i>Manitoba</i> | 1304 | 830 |
| <i>Saskatchewan</i> | 1309 | 938 |
| <i>Alberta</i> | 1292 | 926 |
| <i>British Columbia</i> | 1526 | 1076 |

NOTE: Values are different from The Survey of Household Spending’s official count due to data cleaning. Some values were not tabulated in the correct format, so were removed from the analysis.

The provincial unemployment rate used in the analysis was the rate on record with Statistics Canada.⁹

⁸ <https://www.statcan.gc.ca/en/survey/household/3508>

⁹ <https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=1410002001>

Table 4.2: Provincial Unemployment

| <i>Province</i> | 2007 | 2009 |
|----------------------------------|------|------|
| <i>Canada</i> | 5.1 | 7.1 |
| <i>Newfoundland and Labrador</i> | 12.4 | 14.6 |
| <i>Prince Edward Island</i> | 9.6 | 10.7 |
| <i>Nova Scotia</i> | 7.2 | 7.7 |
| <i>New Brunswick</i> | 6.8 | 7.6 |
| <i>Quebec</i> | 6.4 | 7.5 |
| <i>Ontario</i> | 5.2 | 7.7 |
| <i>Manitoba</i> | 3.4 | 4.2 |
| <i>Saskatchewan</i> | 3.5 | 3.9 |
| <i>Alberta</i> | 2.8 | 5.4 |
| <i>British Columbia</i> | 3.6 | 6.7 |

Statistics Canada. Table 14-10-0020-01 Unemployment rate, participation rate and employment rate by educational attainment, annual

Due to a difference in how data regarding the Territories (Nunavut, Northwest, and Yukon) is reported, I decided to not include those observations in the analysis. The Survey of Household Spending groups all the surveys from the Territories, while Statistics Canada reports the unemployment rate of each Territory separately. While I could have weighted and blended these rates, there was wide variation between the Territories, and a relatively small number of survey respondents (as compared to individual provinces). For these reasons they are omitted from the study and all reported values reflect data collected from the 10 Canadian Provinces only.

All dollar figures are reported in 2002 CAD.

Summary Statistics

Table 4.3: Charitable Donations

| Year | Donor Percentage | Mean | Standard Error | 95% Conf. Interval | |
|-------------|-------------------------|-------------|-----------------------|---------------------------|-----------|
| 2007 | 70.52% | \$ 550.05 | \$ 14.47 | \$ 521.69 | \$ 578.41 |
| 2009 | 67.87% | \$ 527.85 | \$ 14.82 | \$ 498.80 | \$ 556.89 |

NOTE: All dollar values in 2002 CAD

Looking at the reported values, there was a decrease in both the average donation and proportion of respondents which donated to charity between 2007 and 2009. The overlap of the confidence intervals of the donation amount indicate that these differences are not statistically significant, however combined with the downward trend in the percentage of respondents that donated, it creates a plausible narrative that Canadian charities received less in donations during 2009 (during a recession), as compared to 2007 (before recession).

Table 4.4: Household Income

| Year | Mean | Standard Error | 95% Conf. Interval | |
|-------------|--------------|-----------------------|---------------------------|--------------|
| 2007 | \$ 58,401.30 | \$ 399.04 | \$ 57,619.13 | \$ 59,183.46 |
| 2009 | \$ 58,986.77 | \$ 460.57 | \$ 58,083.95 | \$ 59,889.59 |

NOTE: All dollar values in 2002 CAD

Conversely, during this time there was a slight rise in real income for the households in the sample. Though again, this result is not statistically significant due to the overlap of the confidence intervals. However, this result is worth noting and warrants further study beyond the scope of this paper, since if it is both true that households income rose between 2007 and 2009, but charitable donations fell, it indicates that the fall may be due to something beyond simply a change in household finances. Factors like economic uncertainty, perceived job security, and cost changes in other goods are just a few examples of what might explain a change in donations, relative to income. Even if households are on average wealthier in 2009 than 2007, if they feel less wealthy that can change their donation behaviours.

5. Results

Regression Results

All reported regression results include all observations as described in the data section.

There have been no observations excluded for any reason.

Linear Functions

The below two tables outline the results from the two linear models previously described. Overall, the simpler model that does not include provincial dummy variables ends up producing more significant results.

Table 5.1: OLS Regression estimating Charitable Donations

| <i>Variable</i> | Coefficient | Std. Error | t | P> t | 95% Conf. Interval | |
|-------------------------------------|-------------|------------|-------|-------|--------------------|----------|
| <i>Constant</i> | 292.814 | 108.863 | 2.69 | 0.007 | 79.436 | 506.192 |
| <i>Household Income</i> | 0.0077 | 0.00045 | 17.04 | 0.000 | 0.0068 | 0.0086 |
| <i>Year 2009</i> | -8.435 | 36.524 | -0.23 | 0.817 | -80.0238 | 63.155 |
| <i>Newfoundland and Labrador</i> | -153.239 | 207.877 | -0.74 | 0.461 | -560.692 | 254.215 |
| <i>Prince Edward Island</i> | -8.629 | 149.842 | -0.06 | 0.954 | -302.330 | 285.071 |
| <i>Nova Scotia</i> | -122.262 | 99.293 | -1.23 | 0.218 | -316.882 | 72.359 |
| <i>New Brunswick</i> | -100.605 | 93.700 | -1.07 | 0.283 | -284.262 | 83.053 |
| <i>Quebec</i> | -431.635 | 85.251 | -5.06 | 0.000 | -598.734 | -264.537 |
| <i>Ontario</i> | -30.854 | 80.845 | -0.38 | 0.703 | -189.316 | 127.608 |
| <i>Saskatchewan</i> | -169.587 | 47.995 | -3.53 | 0.000 | -263.660 | -75.513 |
| <i>Alberta</i> | -59.291 | 62.536 | -0.95 | 0.343 | -181.866 | 63.284 |
| <i>British Columbia</i> | -111.262 | 63.207 | -1.76 | 0.078 | -235.152 | 12.628 |
| <i>ProvUnemployment</i> | -11.111 | 33.472 | -0.33 | 0.740 | -76.718 | 54.496 |
| <i>ProvUnemployment²</i> | 0.0569 | 1.456 | 0.04 | 0.969 | -2.798 | 2.912 |

N = 22,838 R² = 0.0604

The results from this model are neither significant nor is it well-specified and in addition to this it fails the RESET test, indicating the likelihood of omitted variables and/or functional form misspecification. Lastly, while testing the hypothesis that recession has an impact on

charitable giving by using $ProvUnemployment$ and $ProvUnemployment^2$ does not allow the null hypothesis to be rejected. Overall, this model is the least note-worthy of those that I tested and is best to be ignored.

Table 5.2: OLS Regression estimating Charitable Donations

| <i>Variable</i> | Coefficient | Std. Error | t | P> t | 95% Conf. Interval | |
|-------------------------------------|-------------|------------|-------|-------|--------------------|---------|
| <i>Constant</i> | 319.99 | 64.345 | 4.97 | 0.000 | 193.869 | 446.110 |
| <i>Household Income</i> | 0.00782 | 0.000454 | 17.23 | 0.000 | 0.00693 | 0.00871 |
| <i>Year 2009</i> | 13.8457 | 20.279 | 0.68 | 0.495 | -25.903 | 53.594 |
| <i>ProvUnemployment</i> | -56.507 | 15.410 | -3.67 | 0.000 | -86.711 | -26.302 |
| <i>ProvUnemployment²</i> | 2.433 | 0.834 | 2.92 | 0.004 | 0.798 | 4.067 |

N = 22,838 R² = 0.0543

The results from this regression are much more interesting, primarily because the results from all included variables but the year dummy are statistically significant. Further to this, the results fit with economic reasoning: donations rise as income rises, fall with higher unemployment rates, but there is a diminishing effect. Overall, the initial results seem to suggest that a rise in unemployment rate, in the case of this data caused by economic recession, has an impact on charitable donations that are not only statistically significant, but material. Recall that the average reported donation was \$550.05 in 2007 and \$527.85 in 2009, meaning $\beta_2 = -56.507$ has the potential to indicate significant change in the donated amount.

Testing whether donations are negatively affected by economic recession using $H_0: \beta_2 = \beta_3 = 0$ produces a result that allows us to reject the null hypothesis that provincial unemployment, and thus economic recession, has an impact on charitable donations. However, performing Ramsey's RESET on the model returns a result that indicates that there are either misspecifications and/or omitted variables.

Log-log Functions

I then ran OLS regression on log-log functional forms, reasoning that using the percentage change in household income and charitable donations may provide a better model for drawing conclusions and making forecasts.

Table 5.3: OLS Regression estimating Log(Charitable Donations)

| <i>Variable</i> | Coefficient | Std. Error | t | P> t | 95% Conf. Interval | |
|------------------------------------|-------------|------------|--------|-------|--------------------|----------|
| <i>Constant</i> | -5.613 | 0.487 | -11.52 | 0.000 | -6.568 | -4.658 |
| <i>Log(Household Income)</i> | 0.921 | 0.0451 | 20.40 | 0.000 | 0.8320 | 1.009 |
| <i>Log(Household Income)*y2009</i> | 0.196 | 0.0677 | 2.89 | 0.004 | 0.0630 | 0.328 |
| <i>Year 2009</i> | -2.258 | 0.729 | -3.10 | 0.002 | -3.686 | -0.830 |
| <i>Newfoundland and Labrador</i> | 0.126 | 0.0779 | 1.62 | 0.106 | -0.0268 | 0.278 |
| <i>Prince Edward Island</i> | 0.277 | 0.0950 | 2.92 | 0.003 | 0.091 | 0.464 |
| <i>Nova Scotia</i> | -0.173 | 0.0819 | -2.12 | 0.034 | -0.334 | -0.0130 |
| <i>New Brunswick</i> | -0.0288 | 0.080 | -0.36 | 0.719 | -0.185 | 0.128 |
| <i>Quebec</i> | -1.311 | 0.0745 | -17.59 | 0.000 | -1.457 | -1.165 |
| <i>Ontario</i> | -0.190 | 0.0757 | -2.51 | 0.012 | -0.338 | -0.0414 |
| <i>Saskatchewan</i> | -0.161 | 0.0811 | -1.99 | 0.047 | -0.320 | -0.00231 |
| <i>Alberta</i> | -0.507 | 0.0849 | -5.97 | 0.000 | -0.674 | -0.341 |
| <i>British Columbia</i> | -0.654 | 0.0809 | -8.08 | 0.000 | -0.813 | -0.495 |

N = 22,837 R² = 0.1217

In addition to using a log-log model, this is also where I used the interactive term *Log(Household Income)*y2009* to test the hypothesis. This model proves to be better specified than the linear model using provincial dummies to try to control effect. The result of $\delta_1 < 0$ is statistically significant and shows that the dummy variable indicating it is the year 2009 (being in economic recession) has a negative impact on charitable giving.

Testing the hypothesis using the interactive variable, $H_0: \beta_2 = 0$, provides a result that allows us to reject the null and interpret recession as influencing charitable giving. Again, though, the RESET test fails.

Table 5.4: OLS Regression estimating Log(Charitable Donations)

| <i>Variable</i> | Coefficient | Std. Error | t | P> t | 95% Conf. Interval | |
|-------------------------------------|-------------|------------|-------|-------|--------------------|---------|
| <i>Constant</i> | -6.579 | 0.397 | -16.6 | 0.000 | -7.358 | -5.800 |
| <i>Log(Household Income)</i> | 1.003 | 0.0347 | 28.88 | 0.000 | 0.935 | 1.071 |
| <i>Year 2009</i> | -0.195 | 0.0378 | -5.16 | 0.000 | -0.269 | -0.121 |
| <i>ProvUnemployment</i> | -0.110 | 0.0271 | -4.06 | 0.000 | -0.163 | -0.0569 |
| <i>ProvUnemployment²</i> | 0.00953 | 0.00158 | 6.02 | 0.000 | 0.00642 | 0.0126 |

N = 22,837 R² = 0.0990

The final model is again a simplified version, rather than using provincial dummies to control for effects allowing the provincial unemployment rate data to be a proxy for the recession. All results are significant and the expected signs. Like with the linear model I used $H_0: \beta_2 = \beta_3 = 0$ to test the hypothesis and the results allow the null to be rejected. The RESET test was again failed, though.

Something interesting from these results is that it shows that charitable donations change nearly 1:1 with household income. No conclusions can be drawn at this time, but it is interest to consider the implications of this result. Whether households make decisions about charitable giving rationally, or it can be explained by an external factor such as the practice of tithing (a portion of your income, usually 10%, donated to your church) or similar practices, either religious or not.

Summary of Results

Overall, each of the forms tested produced results of varying significance, but all told the story that economic recession has a negative impact on charitable donations. However, the

fact none of the functional forms passed the RESET test indicates that while the results look promising, more work needs to be done to develop a better specified model to reflect the possible effect more accurately.

6. Conclusions

The results from this study are promising in the sense that it produced results that warrant further study of whether charitable giving is influenced by economic recession. Understanding that consumer decisions, especially in the context of household finances, are complicated and depend on many factors, it is not surprising that the models presented were not correctly specified. Considering the lack of published research on consumer choices around charitable giving in general, never mind during economic shocks, it may also be worth developing that knowledge base further before attempting to understand the impact extreme events.

With the charitable industry accounting for such a significant portion of the Canadian workforce and GDP the lack of research into their primary funding source (donations) is, frankly, disappointing. Not only do the most at-risk individuals rely on the services that charities provide, but many people's livelihoods are contingent on their ability to maintain steady funding. I can't provide a better explanation to why this is the case other than to suggest that there may be a lack of researcher interest, for reasons unknown. Another possibility is that charities do not fit into the traditional economic thinking of firms, consumers, and government.

Evidence suggesting that the effect of being in a period of economic recession has a greater impact on charitable giving than actual changes to household income is also worth noting. If we consider living through a recession as an example of living with economic

uncertainty, this may add to the body of work examining the negative effects of uncertainty. However, it is too early to tell.

Finally, the unexpected result of evidence of charitable giving increases proportionally with income is worthy of its own studies. A potential hypothesis to test would be whether giving is mostly related to a practice like tithing, or whether there is another rational consumer behaviour that can explain it such as tax avoidance or predetermined budgeting.

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