The Financial Crisis of 2008 and 311 Calls in New York City

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Introduction

Trust in American institutions is a crucial component in the functioning of American society. The definition of institutional trust is the expectation that institutions like Congress or police departments will produce effective and positive outcomes (Levi and Stoker, 2000). Without trust in both federal and local government, there can be neither fair democratic processes nor effective responses to crises. The most recent evidence of the importance of institutional trust in governance was during the COVID pandemic. Public trust played a role in people's willingness to adhere to masking mandates and accept medical help. This was especially true in New York City, a center of widespread coronavirus outbreak.

Often, institutional trust is measured using surveying; however, another promising area of research delves into the implications of 311 calls. There are large datasets of 311 call information freely available for most major cities, including New York City. These datasets are attractive because making 311 calls is voluntary and they suggest the belief that a government office will respond effectively (White and Trump, 2016). This study will examine the impact of the financial crisis of 2008 on the frequency of 311 calls. The hypothesis is that, during the recession of 2008, local institutional trust increased, compared to the year before the recession.

Literature Review

Incited by the housing bubble burst in 2008, the US fell into an economic recession, also called the Great Recession, which was the longest-lasting recession since World War II. Real GDP fell 4.3 percent, housing prices fell by around 30 percent, and the government was forced to enact the Economic Stimulus Act of 2008 and the American Recovery and Reinvestment Act of 2009.

Crises like recessions have had a long-documented effect on institutional trust. Mueller (1973) published a landmark book detailing the rally effect, the idea that any dramatic, international event dealt with by the national government will increase a population's trust in that government. The most recent event with this studied effect was 9/11. After the terrorist attack, President Bush's approval rating went up from 56 to 81 percent (Hetherington and Nelson, 2003).

Similarly, Roth (2009) found that, although trust in financial institutions naturally went down after the 2008 recession, trust in national government increased, while Uslaner (2010) also observed that the Great Recession increased people's perception of income inequality. They believed that wealthy businessmen were almost unaffected by the financial crisis, while middle and lower class people suffered.

These studies refer to trust in the federal government. Local governments are more low-profile and the effects of crises are not as heavily studied. However, Rahn and Rudolph (2005) have found that trust in local government depends on several factors, including income inequality, population size, and racial division. This study posits that the increase in a public perception of income inequality after the 2008 housing bubble burst, as well as a greater reliance on city governance, might lead to an increase in local institutional trust.

Finally, we are using the frequency of 311 calls to measure trust. This is based on the finding that more aggressive New York stop-and-frisk practices are correlated with fewer 311 calls, indicating that intrusive policing leads to decreased willingness to trust the city government (Lerman and Weaver, 2013). However, there are differing opinions about this use of 311 calls (Levine and Gershenson, 2014).

Model and Assumptions

Although the dataset varies over time, this study will not use fixed effects, first differencing, or random effect models because time is also our variable of interest. If we estimated a first-differencing equation, we would not be able to test the impact of year 2008 versus year 2007 because it would have been subtracted away. Consequently, this study uses a multiple linear regression OLS model to estimate the impact of the 2008 recession on the number of 311 calls per day.

$$count311 = \beta_0 + \beta_1 y2008 + \beta_2 avgtemp$$

count311 = number of 311 calls made in NYC per day

y2008 = 1 if the year is 2008, 0 if the year is 2007

avgtemp = the monthly daily temperature (℉) in Central Park

The monthly average temperature is included to account for a seasonal effect on 311 calls. The median average income-level would also have been beneficial to include, because it is likely that income-level is correlated with 311 call frequency. Unfortunately, the location of each 311 call is not recorded in the dataset, so there is likely some omitted variable bias causing inconsistency in our estimates. Another likely omitted variable is population size; however, the New York City population grew by only 1.08 percent so population size is not included in the model.

In order to use the multiple regression model, we assume homoskedasticity, a normal conditional mean, and normality of the observed error. There is no exact linear relationship between *avgtemp* and *y2008*.

Data

NYC Open Data contains a comprehensive dataset of 311 service requests from 2004 to the present. This study uses the datasets of 311 service requests from 2007 and 2008. Among the fields included for each call are the date and time created, the date and time closed, the responding agency, the complaint type, etc. There were around 56,000 calls in 2008 and 44,000 in 2007, so we take a random sample of 6,000 calls from each year to run our regression.

The years 2007 and 2008 were chosen because the recession lasted from December 2007 to June 2009. Although the great recession is stated to have started in December 2007, we include December 2007 data because real GDP was still at its peak, according to the US Bureau of Economic Analysis. In order to measure the frequency of 311 calls, we group the calls by day. Each day is a datapoint with a certain number of calls made. The monthly average temperature data is taken from weather.gov.

Results

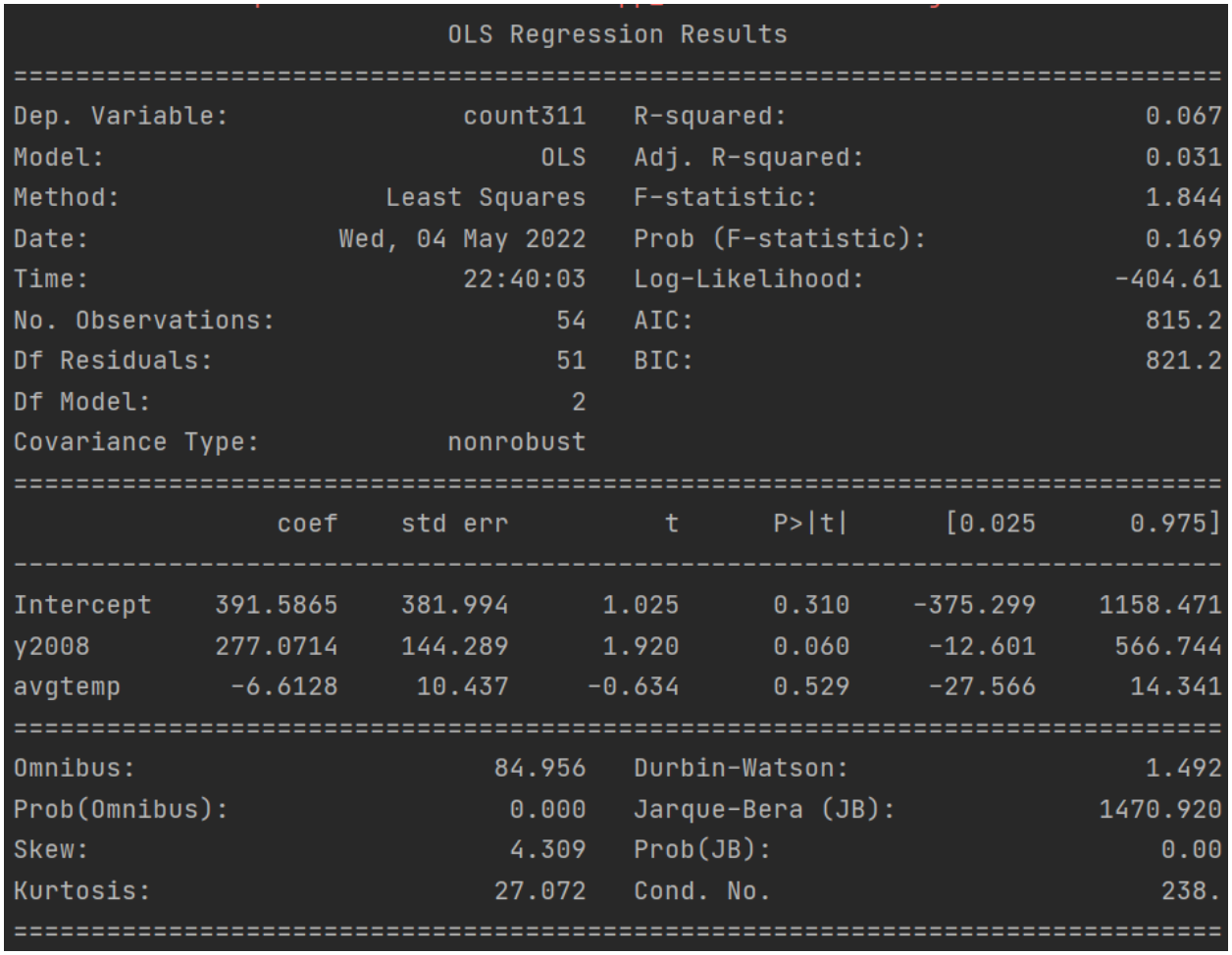
The OLS regression results are shown in Figure 1 below. Our variable of interest, *y2008*, has a coefficient of around 277, meaning that, on average, there were 277 more 311 calls in 2008 than in 2007. This is a sharp increase. When a t-test is run, the p-value is $0.060 < 0.10$. The difference between the two years is only marginally significant, passing with a significance of ten percent but not five percent.

In addition, as the temperature decreases, the number of 311 calls goes up. However, average temperature as a determinant has a p-value of 0.529, meaning that it is not statistically significant. The R-squared value is also incredibly small at 0.067, so the predicted model did not fit well to the data. This could indicate that there is a high amount of randomness determining the number of 311 calls, making it hard to predict using a linear model with only two independent variables. Another reason could be that the model is missing a fundamental variable.

Conclusions

The results of this analysis indicate that there were significantly more 311 calls in 2008 than in 2007. A possible explanation for this result is the 2008 recession, which was a time period in which all New York City inhabitants were affected. There are no other large changes between 2007 and 2008 to which this difference can be attributed. Barack Obama was elected president in 2008, but this had little effect on local governance, and the next New York City mayoral election wasn't until 2009.

Therefore, financial crises not only impact public trust in national government, but also trust in local government bodies. The increased trust in the national government is due to the greater need for government intervention by the general public, because they need to enact monetary and fiscal policies to bring the nation out of recession. This study suggests that this effect also applies to local governments, because the larger number of unemployed people rely on city resources for help. During times of crisis, institutional trust helps keep government officials accountable and improves the willingness of the population to respect orders and emergency mandates from the government. New Yorkers adhered to the lockdowns and masking rules during the COVID pandemic—out of their trust in the government.



OLS Regression Results

Dep. Variable:	count311	R-squared:	0.067
Model:	OLS	Adj. R-squared:	0.031
Method:	Least Squares	F-statistic:	1.844
Date:	Wed, 04 May 2022	Prob (F-statistic):	0.169
Time:	22:40:03	Log-Likelihood:	-404.61
No. Observations:	54	AIC:	815.2
Df Residuals:	51	BIC:	821.2
Df Model:	2		
Covariance Type:	nonrobust		

	coef	std err	t	P>|t|	[0.025	0.975]
Intercept	391.5865	381.994	1.025	0.310	-375.299	1158.471
y2008	277.0714	144.289	1.920	0.060	-12.601	566.744
avgtemp	-6.6128	10.437	-0.634	0.529	-27.566	14.341

Omnibus:	84.956	Durbin-Watson:	1.492
Prob(Omnibus):	0.000	Jarque-Bera (JB):	1470.920
Skew:	4.309	Prob(JB):	0.00
Kurtosis:	27.072	Cond. No.	238.

Figure 1. OLS regression results

https://github.com/ann4bel/nyc_311call_analysis

Figure 2. Link to Python regression code

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