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Impact of Recessions and the Business Cycle on Altruism

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Abstract

I examine how recessions and the business cycle impact the time individuals allocate to altruism, using American Time Use Survey data from 2002-2019. The aim of the paper was to create a measure of altruism to explore changes in attitudes towards charity and altruism instead of the financial ability to do so. Additionally, I want to understand how economic shocks, such as recessions, impact behaviors and habits across the US population. Using ordinary least squares and the Tobit model, I created two models to capture both changes during and after recessionary periods. The first model is a regression of individuals' time allocated to altruistic actions on recessions, controlling for sex, employment, and race. I find that individuals do not spend significantly different amounts of time acting altruistically during recessionary periods. In the second model, I focus on how time spent acting altruistically differed in the years prior to and after 2008 compared to the year 2008. I find evidence that the 2008 recession corresponded to a decrease in altruistic activities up until 2019. The main implication of my results is that there is no necessary public policy action required regarding altruistic behavior during recessions. However, in the years after recessions, governments may need to introduce additional incentives for individuals to allocate more time toward altruism.

Keywords: Altruism; Recessions; Time Use.

1. Introduction

Do we live in a world where individuals care less and less about those outside those outside their political and social groups, and more about those within? Can we measure how these changes have corresponded to global and domestic events? In this paper, I aim to understand better how recessions and the varying state of the economy have impacted altruism. Economists have researched how individuals use their resources to help each other, but only regarding material resources. I want to explore a different resource, time. More specifically, I want to understand altruism through a lens not previously examined: the spending of leisure time on altruism.

Kerr et al. (2004) present altruism as behavior that is benefits the recipient of an action while coming at a cost to the individual acting altruistically. Whereas previous research has examined changes in monetary giving, this paper's novelty comes from focusing on time allocation regarding altruistic actions. This work represents one element of how time allocation and preferences change after recessions and economic shocks. I am motivated by previous work which has underlined the impacts of different shocks, such as Lemieux and Frederic (2014) and Li et al. (2013), who examined how natural disasters impact altruism. I believe that somewhat similarly, economic shocks impact altruistic behavior. By defining altruistic actions through volunteer work and caring for adults living outside an individual's home, this paper focuses on time spent on altruistic acts rather than dollars spent. Thus, I aim to use this measure of altruism to reflect a change in attitudes towards charity and altruism instead of the financial ability to do so. Furthermore, the goal of the paper is to understand the drivers of altruistic behavior. I hypothesize that recessions and negative shocks to the economy have reasons to cause both increases and decreases in time spent acting altruistically. As economic conditions worsen, individuals may be more motivated to help those around them, incentivized by a sense of duty to their community and moral obligations. However, economic deterioration could also make individuals feel disillusioned with their country and community. Having been let down by the economic system,

they may feel that in periods of collective difficulties more than ever, they must think about their own well-being and that of their families. It is uncertain which of these effects will dominate and if they even exist.

In a regression of individuals' time allocated to altruistic actions on recessions, controlling for sex, employment, and race, I find that individuals do not spend significantly different amounts of time acting altruistically during recessionary periods. However, in an alternative model, I find evidence that the 2008 recession corresponded to a decrease in altruistic activities up until 2019. Due to the insignificant result obtained from the first model, I find evidence that supports the idea that either the aforementioned effects cancel each other out or that they do not exist during recessions. However, the regressions indicated that there is a long-term impact of the 2008 recession.

By aggregating the data into several categories, I uncover a series of interesting underlying relationships. Firstly, while time spent on altruism has been decreasing, the data shows that those acting altruistically have increased their time allocated to this activity. Thus, it is unsurprising that the number of individuals acting altruistically has decreased over the last 20 years. The data also shows that between 2003-2021 females tended to act slightly more altruistically than men. Thirdly, I observe that higher levels of education are linked to more altruism, with a clear difference between individuals without a high school degree and those with post-bachelor's education. The data also indicates differences across races, with the Black and White race categories tending to be higher than Hispanic and Asian. However, there does appear to be some convergence across the races over the last five years. Lastly, as expected, employed individuals spend significantly less time acting altruistically relative to those who are not employed. Unfortunately, it is difficult to disentangle these effects.

2. Literature Review

Significant research has been done on why people act altruistically, especially through donations and other monetarily focused methods of altruistic behavior. Notably, Andreoni (1990) explored why people donate and act altruistically by introducing the term "impure Altruism" and his theory of "Warm-Glow Giving." The latter refers to the positive emotional effect that giving has on the individuals who donate. Additionally, Andreoni and Miller (2002) investigated individual preferences regarding prosocial behavior. They found that although different individuals provide significant heterogeneity in their views on benevolence, "subjects exhibit a consistent preference for altruism." Bekkers and Wiepking (2011) covered the eight most important forces driving charitable giving. They listed: awareness of need, solicitation, costs and benefits, altruism, reputation, psychological benefits, values, and efficacy.

Research more closely related to the impact of recessions and the business cycle on altruism is even rarer. Furthermore, the existing literature primarily focuses on monetary elements of altruistic behavior, such as donations. Meer et al. (2017) examined the relationship between the Great Recession and charitable giving. They found significant reductions in donation behavior that were not linked to changes in income or wealth due to the recession. They underlined the importance of their findings by explaining that periods of economic distress are when private philanthropy is most crucial. List and Peysakhovich (2011) found that stock market booms are more impactful on charitable donations than market busts. They looked at individual giving responses to changes in the S&P 500, and the results showed more donations to positive compared to negative changes in the index, with a positive relationship between the two. Osili et al. (2019) examined the heterogeneity of giving across US households and the changes following the Great Recession. Their results vary across race, ethnicity, education, and sex, measuring an 11% decrease in American donors since the recession. Brooks (2018) also finds that the Great Recession significantly impacted charitable giving.

Even though it is not extensive, there is also literature on changes in altruistic behavior following major economic shifts. Fisman et al. (2015) explored the changes in distributional

preferences following the Great Recession using an experimental data approach. Their results indicated that the recession had a significant negative impact on altruism. Furthermore, they examined the changes in selfishness because of the crisis. Similarly, Lim et al. (2015) looked at volunteering behavior during difficult economic periods, specifically the Great Recession's impact on UK volunteering. They found that informal and formal volunteering have declined since 2008, with the impact on the former being significantly larger. Additionally, the results showed that the negative impact was most pronounced in areas that experienced higher unemployment levels, as well as economically and socially disadvantaged regions. However, the authors also noted that the decline was not explained by increasing hardships and financial insecurity. Interestingly, they argued that the negative impact was more a result of "shifting cultural norms of trust" and "civic organizational infrastructure."

There is also research on the impact of income on altruism. Chowdhury and Jeon (2014) performed an experimental investigation on income effects concerning altruistic behavior. Furthermore, they question whether benevolent actions are rooted in altruism or inequality aversion. Impure altruism theory, where an increase in the "common income" of the donor and receiver predicts an increase in charitable giving, is more in line with their results. Meer and Benjamin (2021) examined generosity heterogeneity across wealth and income distributions. They found that both the propensity to donate and donation amounts increase with an individual's resources. Additionally, the authors showed that "the mean percentage of income given is relatively flat across the income distribution." On the other hand, Buckley and Croson (2006) used experimental data to suggest that less wealthy and more wealthy individuals give the same absolute amount. This means that the former give a higher proportion of their income. Auten and Rudney (1990) investigated the variation in individual charitable donations. Their results revealed much higher differences in generosity and variability of donations over time. Li et al. (2019) examined whether windfall money encourages increased charitable donations. In their experimental study,

the authors found that if income came from windfall gains, individuals were more inclined to give to charity.

Literature has also investigated the connection between inequality and altruistic behavior. Duquette and Hargaden (2021) focused on the relationship between inequality and giving. They discovered that higher levels of inequality cause the total number of donations to fall. In contrast, Payne and Smith (2015) found that increasing inequality was related to increases in giving.

Andreoni and Vesterlund (2001) specifically studied gender differences in altruism. Interestingly, their results showed that men tend to be more altruistic when it is cheap, while women are relatively more benevolent when altruism is expensive. Additionally, men are more responsive to changes in price. They also found that while men are more often on the extremes of selfishness and selflessness, women tend to be more moderate.

Brown et al. (2019) focused on the preferences between time and monetary donations. Their experimental study showed that individuals have stronger desires to donate time rather than money, even when this led to significant efficiency losses. They argued that non-monetary donations occur more frequently despite being a less efficient use of resources than monetary donations. The authors partly explained this with the idea that gifts of time have higher signaling properties.

Research has examined whether there is a fixed level of giving. Gee and Meer (2019) focused on encouraging and measuring charitable donations. They underlined that additional donations at one point in time do not decrease future giving later. Deryugina and Marx (2021) pursued a similar topic by looking at evidence from deadly tornadoes. The authors found that while households in zip codes near deadly tornadoes significantly increased donations, there was no resulting negative impact on charity donations in those zip codes. Thus, they concluded that giving as a response to new situations does not adversely impact future donating.

3. Data Overview and Methodology

3.1 Data Overview

To approach the study on the impact of recessions on altruism, I needed data with the highest level of disaggregation regarding how individuals allocated their time. The American Time Use Survey (ATUS) provided that micro level data required between 2002 to 2021. The survey breaks down how Americans allocate their time across various activities. The ATUS is carried out by the US Bureau of Labor Statistics and the Census Bureau, using randomly selected individuals who are eligible if they have completed their eighth months "of interviews for the Current Population Survey (CPS)." Furthermore, individuals must be at least 15 years old. The CPS subset is made up of the "civilian, noninstitutional population residing in occupied households in the United States." The aim of the dataset is to examine how individuals allocate their time across different activities to find national estimates of time use. Over the past few years, the sample size has averaged around 25,000 per annum, having begun with 40,500 in 2003 (the first full year). The respondents are interviewed about their time allocation from the day before the interview. They describe a 24-hour period of that day. From 2002 to 2021, the total number of observations in the sample is 228,455. However, due to the huge impact of covid-19 on the economy and individual conduct, both mandated and changes to personal behavior, I decided to remove observations from 2020 and 2021, reducing observations to 212,702. This is particularly important given that people actively avoided close contact with others, massively hindering acts of altruism such as volunteering and even spending time with individuals outside their households.

Although the ATUS provides more categories of activities, I examined data on time spent carrying out: Household activities, Caring for and helping household members, Caring For & Helping Nonhousehold (NonHH) Members, Work & Work-Related Activities, Education, Leisure, Volunteering and Religious and Spiritual Activities. The measure of altruism in this paper is created by combining elements of volunteering with time spent caring for and helping non-household (NonHH) adults. The specific ATUS categorizations are: all activities with an activity

code beginning with 15 (denoting Volunteer Activities) all activities starting with 0404 (denoting Caring for NonHH adults), and all activities starting with 0405 (denoting Helping NonHH adults).

To measure the state of the US economy, I use a recession dummy which indicates if a month was flagged as a recession or not. I use the US recessionary dates defined by the National Bureau of Economic Research. In this sample, those dates are that of the Great Recession, from December 2007 to June 2009. I also use unemployment rate data from the FRED as an alternative proxy for the state of the economy.

The demographic categories are created using sex, education, race, and employment status. Due to sample size issues, some groups are simplified to ensure each category within the group has sufficient observations. I use male and female for sex, less than a bachelor's degree and bachelor's degree or more for education, and employed and not employed for employment status. I divided race into four categories: Hispanic, White non-Hispanic, Black non-Hispanic, and Asian non-Hispanic. Additionally, due to sample size issues, I created age bins of 10 years from 15-85. I also created a household children dummy that takes the value of 1 if an individual has a child under 18 living in their home. Lastly, the metropolitan dummy is simply a variable that distinguishes whether an individual lives in an urban area or not. Finally, I created four region dummies to divide the observations geographically: west, midwest, south, and north.

Over the entire sample, the average amount of time spent on altruism per day is 0.24 hours (14.5 minutes), with 15% of observations having some time use in altruism as seen in Table A5. More precisely, that is the number of individuals who recorded a non-zero value for time spent altruistically. The largest observation for altruism was 22 hours. The sample's age range was between 15 to 85, averaging 48, with most individuals in their 40s. Additionally, 62% of the sample is employed, and 32% have had an education containing a bachelor's or more. These are both representative of the US, which has had around a 60% employment-to-population ratio since the turn of the century, and nearly 35% have a BA. Furthermore, 56% of the observations are Female, 13% are Black, 68% are White, 14% are Hispanic, and 3.4% are Asian. Again, this

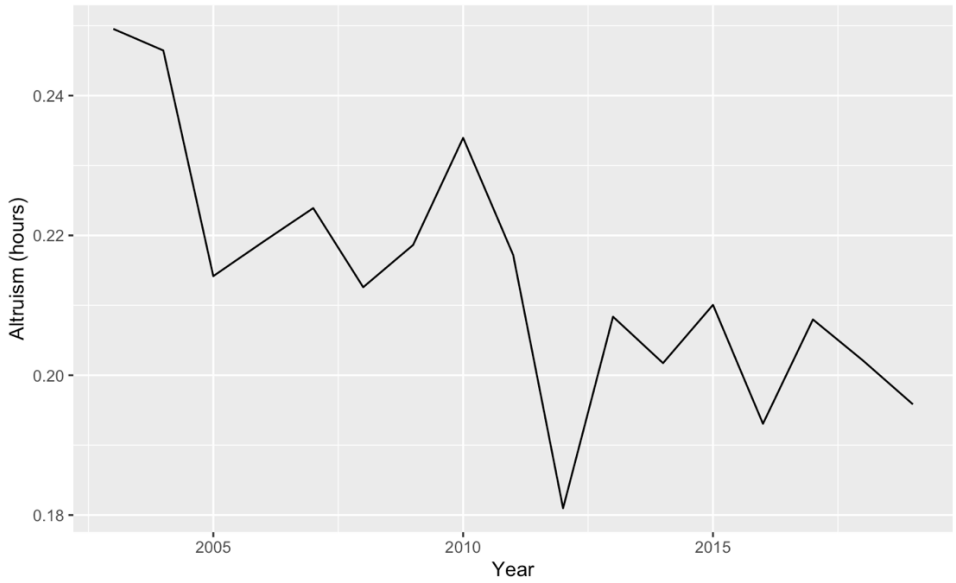

Figure 1: *Yearly Average of Daily Hours Allocated to Altruism*

shows that the sample is representative of the US, although Whites are overrepresented as they only make up around 58% of the population. Lastly, 82% of the sample live in metropolitan areas, and 45% have children under 18 in their households.

Figure 1 examines the yearly development of altruistic time allocation, which shows us the changes over the last couple of decades. The figure shows a negative trend in time allocated to altruism from 2003 to 2021. In 2003, on average, individuals spent 0.25 hours daily on altruistic actions, while in 2021, it was below 0.15. If we examine pre-Covid trends, we see that between 2012 to 2019, the decline seemed to have stabilized at just under 0.2 hours per day. Looking at the Great Recession's time period, it is interesting to note an increase between 2007 to 2010, which is followed by a significant decline until 2012. This may imply that individuals act more altruistically during recessions but that a drop-off follows this. The monthly breakdown of the data shows the high volatility in monthly altruism and does not reveal any obvious patterns, apart from the decreasing trend since 2003.

Figure 2 shows the intensive margin, where, for individuals acting altruistically, there has been a trend of increasing time allocated to altruism. This is particularly interesting because it is the opposite trend to Figure 1. This shows us that over the past 20 years, those acting altruistically

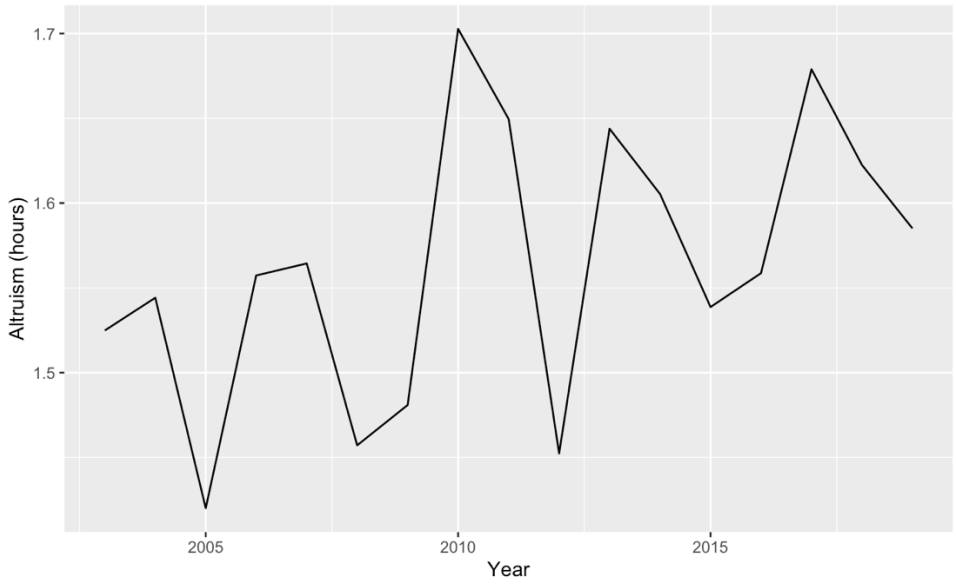

Figure 2: *Average Time Spent Acting Altruistically, conditional on acting altruistically*

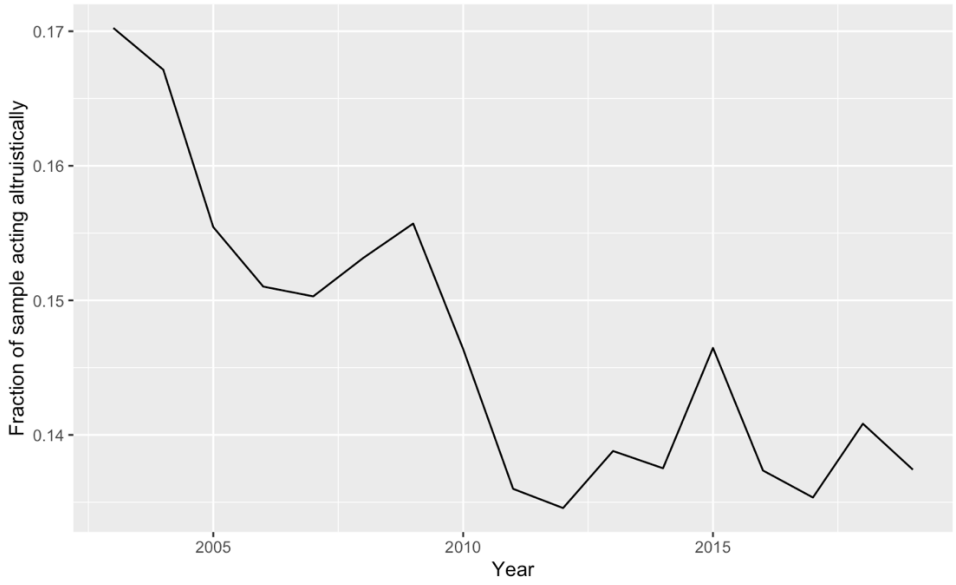

Figure 3: *Fraction of Individuals in the Sample Acting Altruistically*

have increased their benevolent efforts from just above 1.5 hours a day in 2003 to around 1.6 hours in 2019. Interestingly, the largest spike in altruism came in 2010, following the end of the Great Recession, and a previous drop in altruistic actions in 2008 and 2009. This supports the idea that people spend less time helping others during economic downturns. In figure 3, we see the intensive margin, where the fraction of individuals in the sample acting altruistically decreases steadily from 2003 to 2021, with the sharpest drop coming between 2009-2011. The post-recession

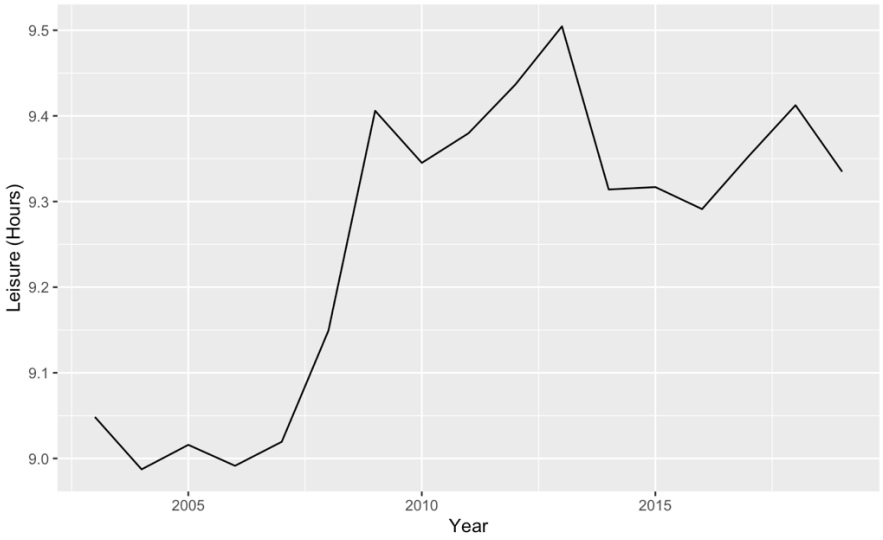

Figure 4: *Yearly Average of Daily Hours Allocated to Leisure*

drop does not recover by 2019. This implies that the negative trend in altruistic actions described earlier is driven by fewer individuals acting altruistically.

It is also important to analyse the other time use categories to better understand the data. Leisure is an element we might expect to experience significant changes because of the business cycle. Based on the calculation in Chadwick et al. (2022), I calculated an individual's minutes spent on leisure with the equation: leisure = $16 - (h_{work} + h_{home} + h_{child} + h_{altruism})$. Here I assume that each day, there are 16 hours available for working. h_{work} represents hours allocated in market production, h_{home} represents hours in home production, and h_{child} represents hours in childcare. The last element, denoting hours spent acting altruistically, was the main element that deviates from Chadwick et al, as I don't want to include altruistic actions as leisure while potentially using leisure time as a control. Furthermore, I use the identical ATUS categorizations used in Chadwick et al. for the leisure calculation.

Figure 4 indicates that, contrary to altruistic activities, leisure time allocation has been rising over the past couple of decades—going from around 9.0 to over 9.3 hours per day. Additionally, taking a closer look at the 2007-2009 recessionary period we observe a significant increase in leisure before somewhat stabilizing over the next 10 years. It is interesting to note that several of the

spikes in leisure correspond with drops in altruism, and vice versa. Thus, it is important to further investigate the relationship between the two.

3.2 Methodology

3.2.1 Recessionary Period Model

The main model uses Ordinary Least Squares to examine the impact of recessions on Time Spent Volunteering. Due to the data's repeated cross-sectional nature, I cannot use individual fixed effects. However, I employed dummies for each year. To ensure there is limited omitted variable bias, I also control for several important factors. I control for sex, education, and employment status in the baseline regression. Firstly, the female dummy is included because women and men have various behavioral differences. Similarly, the education dummy is important because behavior and priorities are likely to change for different levels of education. Lastly, because I want to understand changes in attitudes toward altruism, I control for employment to avoid capturing changes in time allocation due to just having more time due to individuals not being employed, which is more likely during recessions. Thus, the baseline regression can be written out as:

Equation 1:

$$TimeSpentAltruistically_{it} = \beta_0 + \beta_1 Recession_{it} + \beta_2 Female_{it} + \beta_3 Education_{it} + \beta_3 Employment_{it} + \beta_4 Year_{it} + \varepsilon_{it}$$

Where Year represents a list of dummies for each year in the sample.

3.2.2 2008 Year Model

The second model I created used OLS to examine the long-term effects of the 2008 recession on the time allocated to altruism. By using an almost identical regression to the first model, I focused on how time spent acting altruistically differed in the years prior to and after 2008 compared to the year 2008. The scope of the model is more limited, however, it follows the

intuition that following recessions, people are likely to adjust their behavior after having experienced a period of difficulty. Thus, they may act differently and prioritize their time in a different manner. To carry out this analysis, I removed the recession dummy from the regression and included a dummy for each year in the sample, 2002-2019, except 2008, as shown in Equation 2. Thus, I am able to directly examine any differences in altruism between those years and 2008. Importantly, across both models, I cover the impacts of recessions on altruism during and after the Great Recession.

Equation 2:

$$TimeSpentAltruistically_{it} = \beta_0 + \beta_1 Female_{it} + \beta_2 Education_{it} + \beta_3 Employment_{it} + \beta_4 Year_{it} + \varepsilon_{it}$$

Where Year represents dummies for each year in the sample except 2008.

4. Results

4.1 Recessionary Period Model Results

I expected that recessions have either a negative or positive impact on Altruistic actions: either negative economic outcomes will motivate individuals to help others in times of dire need, or the negative shocks might make people feel disillusioned or make them feel like they don't have the capacity to help others. As seen in Table 1's first column, the baseline regression results show no significant relationship between recessions and time spent acting altruistically. This implies that either recessions do not affect altruistic behavior or that the two opposing effects cancel each other out for different demographic groups. More specifically, this result suggests that time allocated to altruism is not significantly different during recessionary months. Furthermore, the regression shows that education and employment both have statistically significant impacts on time allocated to altruism, as indicated by column (1) in Table A1 of the appendix. The former has a positive coefficient, where those with at least a bachelor's degree are associated with a predicted

TABLE 1
Effect of Recessions on Minutes Spent Acting Altruistically

	(1)	(2)	(3)	(4)	(5)
Full Sample of Data (2002-2019)					
Recession	0.32	0.13	0.21	4.46	3.10
	(0.73)	(0.89)	(0.82)	(0.37)	(0.53)
N	212,702	208,858	208,858	212,702	208,858
R-Squared	0.0027	0.0042	0.0192	0.0019	0.0055
Year FEs	√	√	√	√	√
Race Dummies		√	√		√
Additional Covariates			√		√
Tobit Analysis				√	√
Restricted Sample, only those acting altruistically (with altruism>0)					
Coefficient of Interest	-0.70	-0.92	-0.84	-	-
	(0.89)	(0.85)	(0.86)	-	-
N	31,550	30,935	30,935	-	-
R-Squared	0.0093	0.0099	0.1173		
Year FEs	√	√	√		
Race Dummies		√	√		
Additional Covariates			√		

Notes: * $p < .05$, ** $p < .01$. Tobit R-Squared is the pseudo R-Squared. No Tobit analysis provided for the restricted sample because there is no longer a clustering of observations at a limiting value. Due to sample size issues the "Additional Covariates" element only includes the metropolitan dummy and the time spent on leisure.

altruism value of 5.35 minutes higher relative to those without a bachelor's. On the other hand, relative to not being employed, having a job corresponds to 4.51 minutes less of altruistic actions. This is intuitive, as working individuals are likely to have less time to spend in other capacities, such as volunteering. As an extension to the baseline regression, I added a set of covariates to control for different demographic groups.

More specifically, I included race variables, a metropolitan dummy, regional variables, a household children dummy, an age variable, and a time spent in leisure variable. It is also important to consider the percentage of the total variation of the altruism variable that is explained by the covariates in the model. The R-Squared value for the regression is 0.0027, meaning that 0.27% of time spent acting altruistically is explained by the model. A low R-Squared does not

inherently point to a bad regression, as results can still point us to the relationship between variables. However, it is important to note the limitations of a low value. One limitation is the use of coefficients for predictive purposes due to the narrow scope of the analysis relative to all factors that affect time allocated to altruism.

Race was included primarily because the ATUS data does not include income data. As a result, I use race because of the strong relationship between race and income in the US. Semega et al. (2020) examined the real median household income by race and ethnicity in a 2019 study. They find that, on average, Asians earn the most with $98,174, followed by Whites at $76,057, then Hispanics with $56,113, and Blacks with $46,073. Bhutta et al. (2020) found similar results, with a focus on the huge variation in wealth across races. They found that while white families have a median and mean family wealth of $188,200 and $983,400, black families have a median and mean of $24,100 and $142,500, with hispanic families at $36,100 and $165,500, respectively. Secondly, I include the metropolitan dummy due to the notion that behavior is vastly different in cities compared to rural areas. To this point, Glenn and Hill (1977) found evidence that the explanatory benefit of community size was similar to commonly used variables such as family income and occupational prestige, although not as much as education and age. The regional variables were included for a similar reason, with the expectation that habits and conduct differ across the regions of the US. I use regions instead of states due to sample size issues. Likewise, the inclusion of age is because priorities and behaviors change across age groups. The household children dummy is included because I expect that people with children are likely to have less time to act altruistically, and potentially that they feel that they already do this at home, something not captured by the altruism measure. Finally, time spent on leisure is added due to the idea that if people have more time to participate in leisure, they might also spend more time acting altruistically.

As shown in Table 1, even with the inclusion of these variables, the recession dummy continues to have an insignificant impact on altruistic behavior, confirming the previous result.

However, the R-Squared value increased to 0.192, showing the increase in explained variance, although it remains low. Additionally, Table A1 indicates that all the additional covariates, except the black dummy, are statistically significant—with education and employment continuing to have effects in the same direction. More specifically, the negative coefficient of the female dummy implies that, relative to men, women are associated with 1.42 fewer minutes of altruism, holding all other covariates fixed. Additionally, compared to the white category, the Asian and Hispanic dummies are associated with lower time allocated to altruism, 6.86 and 4.95 minutes less, respectively. The metropolitan dummy coefficient shows that, compared to living in rural areas, individuals in urban areas are associated with 1.47 minutes less time spent altruistically, which could be linked to the idea of less selflessness in bigger communities where people do not know each other as well. Furthermore, having children under 18 in a household corresponds to more than 2 minutes less time allocated to altruism, which is unsurprising given the time commitment and high effort that taking care of children entails. Interestingly, every additional year in age is associated with an additional 0.06 minutes of altruistic behavior. Lastly, the result shows that a one-minute increase in leisure is associated with -0.03 minutes of altruism. This indicates that, even when individuals have more time to allocate freely, they do not choose to spend more of it acting altruistically.

To disentangle the various potential effects at play, I ran identical regressions while restricting the sample to only observations with non-zero values of altruism. Although this restriction massively reduces the sample size to 30,935, it is important to understand whether the effects are different for those acting altruistically compared to the general sample—as implied by Figure 2. Table 1 presents the estimates, showing that the recession dummy remains statistically insignificant. This further supports the strength and reliability of the insignificant results. Additionally, Table A1 indicates that the race variables are no longer significant, implying that characteristics among individuals acting altruistically are similar enough, meaning that elements captured by race, such as income, are no longer significant. Additionally, the direction of

education's effect on altruism flips in this sub-sample, with lower levels of education being associated with higher altruism. Lastly, in the model with the additional covariates, the R-Squared value of 0.12 indicates that the covariates have a significantly larger explanatory power in the restricted sample.

The next specification I used is the Tobit model. McDonald and Moffitt (1980) explain that Tobit analysis assumes a large number of values of the dependent variable is clustered around some limiting value. Thus, model is fitting for this data because 85% of the observations have a value of 0 for the dependent variable, time spent acting altruistically. As a result, I applied the Tobit model setting the minimum limit at 0 since it is impossible to have a negative value for time spent acting altruistically. With the new specification, the recession dummy continued to be statistically insignificant, further supporting the initial results. Additionally, all the controls were statistically significant, including female and household children.

4.1.1 Robustness Checks

The first robustness check I employed was running the original model using the unemployment rate instead of the recession dummy as a measure of the state of the economy—similarly to Lim et al. (2015). This regression can be seen under equation 3. Although the labor market can lag, we expect them to move similarly. Thus, it is important to ensure that the effect is similar for both independent variables. Table 2 shows the different specifications stemming from Equation 3. Again, I find that for the equivalent baseline regression unemployment rate is not statistically significant. This is also true after having added the additional variables listed earlier. The R-Squared values remain almost identical to those the baseline model in Table 1. Furthermore, there is almost no change in the coefficients of the covariates, as indicated by Table A2.

Equation 3:

$$TimeSpentAltruistically_{it} = \beta_0 + \beta_1 Unemployment_{it} + \beta_2 Female_{it} + \beta_3 Education_{it} + \beta_3 Employment_{it} + \beta_4 Year_{it} + \varepsilon_{it}$$

TABLE 2
Effects of Economic Indicators on Minutes Spent Acting Altruistically

	(1)	(2)	(3)	(4)	(5)	(6)
Full Sample of Data (2002-2019)						
Coefficient of Interest	0.66	0.60	2.95	-0.00090	0.00008	0.00818
	(0.11)	(0.15)	(0.19)	(0.53)	(0.95)	(0.30)
N	212,702	208,858	208,858	212,702	208,858	208,858
R-Squared	0.0028	0.0192	0.0055	0.0026	0.0192	0.0055
Unemployment Rate	√	√	√			
Change in S&P 500				√	√	√
Year FEs	√	√	√	√	√	√
Race Dummies		√	√		√	√
Additional Covariates		√	√		√	√
Tobit Analysis			√			√
Restricted Sample, only those acting altruistically (with altruism>0)						
Coefficient of Interest	2.75	2.46	-	0.004	0.006	-
	(0.22)	(0.25)	-	(0.60)	(0.47)	-
N	31,550	30,935	-	31,550	30,935	-
R-Squared	0.0094	0.1180	-	0.0100	0.1180	-
Unemployment Rate	√	√				
Change in S&P 500				√	√	
Year FEs	√	√		√	√	
Race Dummies		√			√	
Additional Covariates		√			√	

Notes: No Tobit analysis provided for the restricted sample because there is no longer a clustering of observations at a limiting value. * $p < .05$, ** $p < .01$. Due to sample size issues the "Additional Covariates" element only includes the metropolitan dummy and the time spent on leisure.

I also restricted the sample to those with non-zero altruism measures with the unemployment rate independent variable. Like with the recession dummy, the unemployment rate remained statistically insignificant regardless of the specification, as seen in Table 2. I could not employ the Tobit model because the restricted sample no longer clusters around a limiting value, as I removed all observations with zero altruism.

Similarly to replacing the recession dummy with the unemployment rate, I also ran the regression using the S&P500 Index as a different measure of the state of the US economy more focused on the financial markets. This is in line with the List and Peysakhovich (2011) approach. Specifically, I created a variable for the change in the monthly price of the index. Despite the difference between the variables, the S&P variable was also statistically insignificant for all variations of the baseline model, the Tobit model, and the restriction to the smaller sample. Again, as seen in the R-Squared values, the predictive power of these models is almost identical to the baseline model.

Another robustness check I employed was running the same model but examining the extensive margin. To accomplish this, I converted the continuous altruism variable into a dummy variable of whether the individual had acted altruistically or not. Table A4 shows the results of this specification using the recession dummy in column (1), the unemployment rate (2), and the S&P 500 (3), including the additional covariates listed above for each of them. All three of these regressions support the result of the insignificant impact of the economic indices on time spent on altruism, with the R-Squared value remaining very similar to earlier regressions.

4.2 2008 Year Model Results

For the year model, I examined the year dummies relative to the only full year of the Great Recession, in 2008. I removed the economic measures (the recession dummy and unemployment rate) to only focus on the years themselves, especially making sure I am not controlling for the period of the Great Recession. With the inclusion of the additional coefficients, as seen in column (1) of Table 3, the years 2003 and 2004 are statistically significant with positive coefficients. This means that relative to 2008, those years have higher predicted amounts of time allocated to altruism. Specifically, 2003 is associated with 1.97 minutes more time spent altruistically and 2004 with 1.74 minutes. Holding all else fixed, this result implies that the recessionary period was linked

TABLE 3
Long Term Effects of the 2008 Recession on Minutes Spent Acting Altruistically

	Full Sample OLS	Tobit Model	Restricted Sample OLS	Altruism Dummy Model
	(1)	(2)	(3)	(4)
2002	0.75 (0.939)	-1.67 (0.753)	-1.45 (0.77)	-0.0013 (0.820)
2003	1.97** (0.004)	12.61** (0.001)	1.44 (0.671)	0.0143** (0.000)
2004	1.74* (0.018)	11.16** (0.005)	3.67 (0.319)	0.0123** (0.005)
2005	0.07 (0.928)	0.29 (0.943)	-2.57 (0.497)	0.0010 (0.827)
2006	0.48 (0.523)	-1.51 (0.710)	4.21 (0.274)	-0.0037 (0.411)
2007	0.41 (0.585)	-1.88 (0.647)	3.37 (0.386)	-0.0041 (0.369)
2009	0.90 (0.224)	2.50 (0.532)	3.14 (0.404)	0.0016 (0.724)
2010	1.20 (0.105)	-2.63 (0.515)	10.37** (0.007)	-0.0076 (0.085)
2011	-0.11 (0.882)	-12.73** (0.002)	8.86* (0.025)	-0.0179** (0.000)
2012	-1.20 (0.113)	-15.36** (0.000)	3.93 (0.326)	-0.0189** (0.000)
2013	-0.16 (0.834)	-10.84* (0.011)	6.96 (0.086)	-0.0156** (0.001)
2014	-0.10 (0.896)	-11.24** (0.008)	7.78 (0.054)	-0.0163** (0.000)
2015	0.05 (0.951)	-4.84 (0.255)	4.38 (0.277)	-0.0076** (0.100)
2016	-0.91 (0.248)	-13.63** (0.002)	4.66 (0.262)	-0.0173** (0.000)
2017	-0.15 (0.853)	-13.22** (0.003)	11.83** (0.005)	-0.0194** (0.000)
2018	0.44 (0.587)	-9.91* (0.026)	10.60* (0.013)	-0.0160** (0.001)
2019	-0.65 (0.429)	-13.8** (0.002)	8.49* (0.050)	-0.0189** (0.000)
R-Square	0.0192	0.0055	0.1179	0.0097

Notes: No Tobit analysis provided for the restricted sample because there is no longer a clustering of observations at a limiting value. * $p < .05$, ** $p < .01$.

to a decrease in altruistic actions. Additionally, the regression implies that the negative effect does not recover as all years after 2008 are statistically insignificant.

Furthermore, I combined this specification with the Tobit model in column (2). As Table 3 shows, the effects were even more pronounced in this model. Like the specification above, 2002 and 2003 are statistically significant with positive coefficients. However, 2011, 2012, 2013, 2014, 2016, 2017, 2018, and 2019 are also statistically significant. These years have negative coefficients, relative to 2008, varying from being associated with 0.11 to 1.2 minutes less of altruistic actions. These results imply that the Great Recession had a lasting negative impact on time spent acting altruistically, for at least 11 years. Additionally, this negative effect might

continue further than 2019, given that that is when the sample ends. This specification provides the strongest support for the hypothesis that economic downturns potentially lead to disillusionment and a change in behavior, thus reducing time allocated to altruism.

I also applied the specification above to the restricted sample with non-zero values for altruism. Consistent with previous results of the restricted sample, the effects are different from the full sample. As seen in column (3) of Table 3, while none of the years prior to 2008 are significantly different from 2008, dummies for the years 2010, 2011, 2017, 2018, and 2019 are significantly different. Additionally, while the coefficients for the full sample were negative after 2008, all significant coefficients are positive for this sample. This implies that for those acting altruistically, the recession had a positive long-term impact on how much time they allocated to altruism. Thus, this supports the hypothesis that individuals may feel inclined to help others in times of need if they are already acting benevolently.

I also applied the altruism dummy robustness check to the year model. I find that the results of higher altruism before 2008 and lower altruism after 2008 found in the Tobit analysis hold with this check. Column (4) shows that relative to 2008, the years 2003 and 2004 are statistically significant with positive coefficients. Relative to 2008, those years are associated with an increased probability of acting altruistically by 1.4 and 1.2 percentage points respectively. On the other hand, every year from 2011 to 2019 was significantly associated with a decrease in the probability of acting altruistically, relative to 2008, ranging from 0.76 to 1.94 percentage points lower. Thus, I am more confident in the results of the year model.

5. Discussion

The key limitation of the paper is the data. Firstly, the measure of altruism I used only captures some altruistic actions individuals allocate time toward. I believe that the scope of the measure is insufficient as altruistic acts can be carried out in various unmeasurable situations; an

act as simple as giving up a seat on a bus can be classified as altruism. Nonetheless, getting data that truly captures those elements is nearly impossible. Furthermore, despite the length that the ATUS goes to avoid issues of reporting, survey data will always be subject to potential errors. Lastly, due to the data's cross-sectional nature, we cannot observe how the same individuals' altruistic time allocation changes over time and, most importantly, during and after recessions. Hopefully, future research will help solve these data issues, either through a more specific way to collect altruism data, a panel dataset of individuals, or ideally both.

Another limitation is the external validity of the study. While the paper aims to examine the impacts of recessions, the only recession in the sample is the Great Recession, a unique type of recession in terms of scope and severity. Thus, the paper's results may not be easily extended and generalized to recessions broadly. Furthermore, the research only focuses on the US, making it less applicable to other parts of the world. Ideally, future research could evaluate the same relationships across several recessions worldwide. An ideal data set would cover many countries across a larger time frame to include more recessions.

6. Conclusion

In the first model, I examined the impact of economic indicators on altruism, while the second model was a regression to understand the impact of the 2008 recession. The former implies that time spent acting altruistically is not significantly different during recessionary periods nor due to the business cycle, while the latter insinuates that the 2008 recession had a long-term negative impact on time allocated to altruism throughout the 2010s. It is important to note that the post-recessionary period was a period of lower growth compared to pre-2007.

A key implication of my results is that there is no necessary public policy action required regarding altruistic behavior during recessions. However, in the years after recessions, governments may need to introduce additional incentives for individuals to allocate more time

toward altruism. Fehr and Fischbacher (2003) underline the importance of altruism in human society. They describe evidence of the powerful force of human altruism as unique across species. To this end, the authors explain that "depending on the environment, a minority of altruists can force a majority of selfish individuals to cooperate or, conversely, a few egoists can induce a large number of altruists to defect." Given that my results indicate that negative changes in economic conditions are related to a change in the time allocated to altruism in the long term, policy officials should be concerned about any reductions of this type of benevolent activity in the context provided. However, as mentioned in my limitations paragraph, this only applies to the altruism variable defined in this paper—focusing on volunteering and helping and caring for non-house adults.

Future research could also focus on the long-term impacts of the Covid 19 pandemic on time spent acting altruistically. As I mentioned in my reasoning for removing 2020 and 2021 data, Covid is a unique economic and psychological shock. Not only was the economy hit extremely hard, but people's behavior was forced to change—especially during lockdowns. Thus, it would be intriguing to uncover if there are long-term impacts of these behavioral changes, specifically concerning altruism. I hypothesize that Covid may have decreased our willingness to help our neighbors and communities due to the nature of the virus. However, I also argue that going through such an intense period of isolation might bring people closer together in the long run as they feel they should be doing more to help those who suffered disproportionally from the global shock.

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8. Appendix

TABLE A1
Covariates of the Impact of Recessions on Altruism

	Baseline Model Coefficients	Additional Var. Coefficients	Tobit Model Coefficients	Restricted Sample Coefficients
	(1)	(2)	(3)	(4)
Female	-0.21 (0.436)	-1.42** (0.000)	10.54** (0.000)	-22.23** (0.000)
Education	5.36** (0.000)	3.72** (0.000)	31.87** (0.000)	-4.07** (0.005)
Employment	-4.51** (0.000)	-10.74** (0.000)	-36.30** (0.000)	-43.05** (0.000)
Black	-	-0.29 (0.458)	-6.77** (0.002)	3.55 (0.083)
Asian	-	-6.86** (0.000)	-62.08** (0.000)	0.60 (0.895)
Hispanic	-	-4.95** (0.000)	-43.56** (0.000)	-3.77 (0.109)
Metropolitan	-	-1.47** (0.000)	-8.20** (0.000)	-3.30 (0.060)
Age	-	0.06** (0.000)	0.21** (0.000)	0.26** (0.000)
HH Children	-	-2.34** (0.000)	-17.32** (0.000)	-7.98** (0.000)
Leisure	-	-0.03** (0.000)	0.11** (0.000)	-0.19** (0.000)

Notes: No Tobit analysis provided for the restricted sample because there is no longer a clustering of observations at a limiting value. * $p < .05$, ** $p < .01$.

TABLE A2
Covariates of the Impact of the Unemployment Rate on Altruism

	Baseline Coefficients	Tobit Model Coefficients	Restricted Sample Coefficients
	(1)	(2)	(3)
Female	-1.42** (0.000)	10.54** (0.000)	-22.22** (0.000)
Education	3.72** (0.000)	31.87** (0.000)	-4.07** (0.005)
Employment	-10.74** (0.000)	-36.30** (0.000)	-43.05** (0.000)
Black	-0.29 (0.458)	-6.77** (0.002)	3.54 (0.084)
Asian	-6.86** (0.000)	-62.08** (0.000)	0.61 (0.893)
Hispanic	-4.95** (0.000)	-43.56** (0.000)	-3.75 (0.110)
Metropolitan	-1.47** (0.000)	-8.20** (0.000)	-3.31 (0.060)
Age	0.06** (0.000)	0.21** (0.000)	0.26** (0.000)
HH Children	-2.34** (0.000)	-17.32** (0.000)	-7.98** (0.000)
Leisure	-0.03** (0.000)	-0.11** (0.000)	-0.19** (0.000)

Notes: No Tobit analysis provided for the restricted sample because there is no longer a clustering of observations at a limiting value. * $p < .05$, ** $p < .01$.

TABLE A3
Covariates of the Impact of the Change in the S&P 500 Index on Altruism

	Baseline Coefficients	Tobit Model Coefficients	Restricted Sample Coefficients
	(1)	(2)	(3)
Female	-1.42** (0.000)	10.54** (0.000)	-22.24** (0.000)
Education	3.72** (0.000)	31.87** (0.000)	-4.07** (0.005)
Employment	-10.74** (0.000)	-36.30** (0.000)	-43.05** (0.000)
Black	-0.29 (0.458)	-6.77** (0.002)	3.55 (0.084)
Asian	-6.86** (0.000)	-62.07** (0.000)	0.61 (0.893)
Hispanic	-4.95** (0.000)	-43.56** (0.000)	-3.78 (0.110)
Metropolitan	-1.47** (0.000)	-8.21** (0.000)	-3.30 (0.060)
Age	0.06** (0.000)	0.21** (0.000)	0.26** (0.000)
HH Children	-2.34** (0.000)	-17.31** (0.000)	-7.98** (0.000)
Leisure	-0.03** (0.000)	-0.11** (0.000)	-0.19** (0.000)

Notes: No Tobit analysis provided for the restricted sample because there is no longer a clustering of observations at a limiting value. * $p < .05$, ** $p < .01$.

Table A4
Effects of Economic Indicators on Minutes Spent Acting Altruistically

	(1)	(2)	(3)
Full Sample of Data (2002-2019)			
Coefficient of Interest	0.0042	0.0025	-.00001
	(0.44)	(0.15)	(0.18)
N	208,858	208,858	208,858
R-Squared	0.0097	0.0097	0.0096
Recession Dummy	√		
Unemployment Rate		√	
Change in S&P 500			√
Year FEs	√	√	√
Additional Covariates	√	√	√

Table A5
Descriptive Statistics

Variable	Obs	Mean	Std. Deviation
Altruism (minutes)	212,702	14.50	59.85
Altruism Dummy	212,702	0.15	0.36
Age	212,702	47.55	17.83
Employment Dummy	212,702	0.62	0.49
Education Dummy	212,702	0.32	0.47
Female Dummy	212,702	0.56	0.50
Asian Dummy	212,702	0.03	0.18
Black Dummy	212,702	0.13	0.34
White Dummy	212,702	0.68	0.47
Hispanic Dummy	212,702	0.14	0.34
Metropolitan Dummy	212,702	0.82	0.38
Leisure (minutes)	212,702	575.23	262.62