The Effect of a Recession on the Volunteer Workforce and Donation Activity in the United States

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Abstract

The non-profit sector is an important and integral part of the American Economy. During a recession, the demand for both the volunteer workforce and monetary donations increases. In our paper, we analyze the effect of a recession on the supply of volunteer hours and donations in the United States. We hypothesize that supply of both volunteer hours and donations will increase during a recession, because the intrinsic motivations will continue to outweigh the extrinsic motivations as prior to the recession. We develop a model to replicate the individual's decision making and determine that the effect of a recession on volunteering and donations depends on the level of altruistic motivation present during these times. The empirical analysis rejects our hypothesis. The extrinsic motivations dominate the intrinsic motivations in times of economic distress. During a recession, donations decrease. However, there is no significant change in volunteer hours.

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Introduction

Many goods and services are non-rival and non-exclusive, and as a result would not be provided by the free market alone. In addition, the government is unable to provide all of these aforementioned services. Therefore, the sustainability of the non-profit sector is crucial to the economy, and government policies pertaining to the sector's inputs must be analyzed effectively.

The non-profit sector is funded largely through donations, and many of the operations in this sector involve the use of volunteers. Volunteer activity is work performed without monetary compensation, which creates social output that would otherwise require paid resources (Freeman 1997). Approximately 64.3 million people volunteered in the United States from September 2010 to September 2011 (Bureau of Labor Statistics, 2012). In 2010, volunteers served 8.1 billion hours, which was valued at approximately $173 billion, according to the Corporation for National & Community Service (2011). According to the Internal Revenue Agency (2012) a charitable contribution represents a donation of money or gifts to a qualified and recognized organization without the

expectation of anything in return. For the purposes of our research, we are interested in determining the effect on solely monetary contributions rather than physical gifts. In 2011, individuals, foundations and corporations increased aggregate donations from the prior year by 4 percent to $298 billion (The Center on Philanthropy at Indiana University 2012).

Since the non–profit sector requires both donations and volunteers to function, it becomes critical to assess the interdependence of monetary donations and time spent volunteering, both of which are philanthropic endeavours. Much of the literature on volunteerism and donations of money discuss whether or not donations of time and money are related. Andreoni, Gale and Sholtz (1996), Brown and Lankford (1992) found that gifts of time and money were complements of each other, as did Menchik and Weisbrod (1987) and Callen (1994). Understanding the nature of the relationship between these two activities is essential when explaining behaviours and developing appropriate government policies. For example, the effect of deductibility of charitable donations on the amount of time spent volunteering is dependent on whether these two activities are complements, substitutes, or neither. We expect the nature of this relationship to contribute to patterns witnessed during a recession on these two philanthropic activities, and thus the relationship is considered in our model and empirical analysis.

During a recession, volunteers and donations become even more critical for the functioning of an economy, as there is an increase in unmet needs during this period (Starr 2010). The rise in demand is a result of greater need for human services, as homelessness, hunger, mental health problems, crime and other social problems rise while less funding is available to meet these needs. Despite the importance of volunteer activity during a recession, the economic literature involving the voluntary labour force has been relatively quiet compared to other topics, due to the lack of compensation received by participants (Menchik and Weisbrod 1987). Volunteering raises questions about behaviours and social pressures that are not part of standard analyses of work for compensation (Freeman 1997). The economic community must consider the patterns in volunteering and donating, as government policy has the ability to affect these patterns. In our paper, we would like to determine the relationship during a recession, when there is a surge in demand for volunteers and donations. The results of this paper will have important policy implications especially if the supply of philanthropic activity does not increase to meet this higher demand. If there is a shortage of donations and volunteer activity, then the government should devise and implement policies that encourage individuals to donate their time and money during a recession.

Literature Review

Volunteering is an interesting subject largely because there are few, if any, monetary incentives for participation. Generally, an individual’s decision to work is seen as a means of accumulating money, with which he or she can gain some utility through the consumption of goods and services as well as spending time on leisure and other activities. The decision to volunteer, on the other hand, cannot be understood in terms of

direct monetary reward. Donations actually reduce the money available for the individual to spend on consumption. Thus, much of the literature on this subject argues as to what motivates an individual to donate time and money. We want to use the previous conclusions on philanthropic activities in order to determine the patterns that explain volunteering and donation during a recession, and whether certain motivational effects are more or less prevalent during a recessionary period. The major types of motivations discussed in the literature are "intrinsic" and "extrinsic".

Intrinsic Motivations to Volunteer

An individual is "intrinsically motivated to perform an activity when he receives no apparent rewards except the activity itself" (Deci 1971, 105). Intrinsic motivation would indicate that relative prices and opportunity costs have only limited effects on an individual's decision to donate time and money. If the intrinsic motivations have a dominant effect on decision-making, we expect to find that during a recession, when the opportunity cost of philanthropic activities increases, volunteer activity and donations still increase. Since non-profit organizations experience a greater strain, and must stretch their services in times of troubles, altruistically motivated individuals would experience increased utility by helping others through increasing donations of time and money during a recession. In particular, there are three basic rewards that are associated with intrinsic motivations (Meier and Stutzer 2008): the utility of the recipient, feelings of competence by the donor, and the act of helping another. We consider these intrinsic motivations in our regression analysis, as they will determine which type of individual will volunteer in a recession, and may contribute to the changes in patterns witnessed throughout the recession.

The voluntary sector and non-profit organizations are considered a type of public good (Andreoni 1988). As such, altruism plays an important role in explaining volunteer behaviours, but will not solely predict the patterns witnessed in the voluntary sector. According to Andreoni (1988), pure altruistic behaviours fail to explain the empirical data as in large economies, the prevalence of free riders results in only a very small portion of the population donating. Consequently, the average "giving converges to zero" (Andreoni 1988), and volunteer behaviour, therefore, must be additionally influenced by extrinsic motivation. In addition, the presence of monetary incentives may actually negatively effect on volunteer behaviour when intrinsic motivations are present (Frey and Goette 1999), which has implications for the type of government policies that can encourage volunteer behaviour during a recession.

Extrinsic Motivations to Volunteer

There are numerous extrinsic motivations discussed in the literature that will impact the variables incorporated into our econometric regression equation. Extrinsic motivations refer to the outside incentives placed upon an individual, such as financial rewards or recognition. This type of motivation would indicate that relative prices and opportunity costs significantly affect an individual's decision to donate time and money.

The promise of financial rewards, such as tax deductions, provides an incentive to offer volunteer services (Frey and Goette 1999). To measure the extrinsic motivations, the opportunity cost of volunteering can be interpreted as an individual's after-tax wage rate (Menchik and Weisbrod 1987). Accordingly, changes in the wage rate and tax rates can affect an individual's decision to volunteer. Thus, during a recession, when wages increase the opportunity cost also increases, and we will expect the supply for voluntary hours and donations to decrease.

According to Freeman (1997), significant factors affecting the supply of volunteering include the likelihood of being asked to volunteer, the value individuals place on charitable activity, the effect of social pressure and the perceived moral obligation associated with volunteering. Individuals with higher levels of education, employment and generally higher incomes are more likely to be asked to volunteer. This provides an explanation for why people with higher wages and thus higher opportunity costs contribute more to philanthropic activities and suggests that the intrinsic motivations dominate the extrinsic motivations of relative prices and opportunity costs.

Hypothesis

There are two different ways to view the volunteer sector and donation environment:

a) Volunteer work and donation activity can be interpreted under the same framework as any other sector in the economy – individuals make decisions based on the relative prices (opportunity cost). The opportunity cost of volunteering is higher when the wages in the economy increase, hence less voluntary work is offered. Similarly, the opportunity cost of donating is lower when wages rise hence more money is donated. Under this interpretation, the decisions to donate time and money can be understood through their extrinsic motivations.

b) Many volunteers find the goals and purpose of the volunteer sector attractive and achieve some utility from giving and providing services and resources that benefit others. "Ideological founders will seek to hire managers and employees who share their vision. Committed employees may be easier to attract ... (and) may accept lower levels of pay in return for greater certainty that their efforts are actually helping to achieve their altruistic goals" (Rose-Ackerman 1996, 719-720). This view of the non-profit sector extends to the intrinsic motivations discussed earlier.

Given that a significant portion of volunteer activity is provided by employed individuals with high productivity and income, which translates to high opportunity costs (Freeman 1997), this provides reason to hypothesize that intrinsic motivations dominate extrinsic motivations. Those individuals who donate volunteer time are also providing monetary donations. While people who donate usually have lower opportunity costs because of higher wages, the fact that these are the same individuals providing high levels of

volunteer time still supports the idea that the latter effect (b) dominates (a). Thus, during difficult times when there is greater demand for volunteers and donations, the intrinsic motivations will increase further. However, considering that wages decrease during a recession, the extrinsic motivations will decrease as the opportunity cost of volunteering and donations will be lower. Considering that people with higher productivity and income are the ones who pursue philanthropic endeavors in the first place, and that higher wealth individuals are less financially affected proportionally by a recession (Smeeding 2012) than the intrinsic motivations will continue to exceed the extrinsic motivations. Thus, we will expect the supply of volunteer hours and donations to increase during a recession.

Model

The literature on economic modelling of donating time and money is focused largely on two different models: the public goods model and the private consumption model. The public goods model states that individuals will donate time and money if the output or quality of output increases. Therefore, an individual will donate because he values the provision of the public good. The latter model specifies that individuals will always contribute time and money as long as they obtain some enjoyment or utility from giving (Duncan 1999). We will be using the private consumption model in our paper because we are assuming that the individuals are rational and will maximize their utility subject to their constraints.

In our research, we will assume that all supply of volunteers will be consumed, hence there is no surplus in the market, and the demand for volunteers is perfectly elastic at a price of zero (Menchik and Weisbrod 1987).

Let U = Utility of an individual

An individual's utility curve is assumed to be concave and increasing in all goods. Our model will be an extension of the private consumption model that was derived by Menchik and Weisbrod (1987). U is a function of the time spent on leisure (L), the time spent volunteering (v), the amount of consumption expenditures (C), and the amount of monetary donations contributed (D) (Menchik and Weisbrod 1987):

$$U = U(L,v,C,D)$$

The individual faces a time endowment (T), which can be spent pursuing leisure (L), working (H) or volunteering (v):

$$T= v + L + H$$

We will normalise the time endowment to 1 (i.e. T = 1 year)

We want to maximize this utility function, subject to the individual's budget constraint. Let w represents the individual's real wage and let Y represent all non-wage income earned by the individual. Therefore, the budget constraint will be:

$$C = w\,(1- L - v) – D + Y$$

We assume that individuals want to maximize their utility function U subject to the budget constraint, C. Thus, the Lagrangian function is Ł:

$$Ł = U(L,v,C,D) – \lambda\,[w\,(1 – v – L) – D + Y – C]$$

In our model, the utility function will be assumed to be a Constant Elasticity of Substitution function. Thus:

$$U(L,v,C,D) = [a_1L^p + a_2v^p + a_3C^p + (1 - a_1 - a_2 - a_3)D^p]^{1/p}$$

Extending from Menchik and Weisbrod's model, we want to introduce a parameter that models the effect of a recession on the volunteer labour supply. We will include the Recession parameter (R) into the model as a dummy variable where:

$$R = \begin{cases} 1 \text{ when there is a recession} \\ 0 \text{ otherwise} \end{cases}$$

Hence, the utility function is now:

$$U(L,v,C,D) = [a_1L^p + (a_2 + b_2R)v^p + (a_3 + b_3R)D^p + (1 - a_1 - a_2 - a_3)C^p]^{1/p}$$

With this new utility function, we can determine the numerical effect of recession on volunteering (b_2) and donations (b_3) where b_2, b_3 are real numbers. According to this utility function, a recession might affect the utility from volunteering and donating. For example, if $b_2 > 0$, then during a recession, the utility from volunteering will increase indicating that intrinsic motivations is dominating, and volunteering will increase. However, if $b_2 = 0$, then the recession has no effect on volunteering.

Our Lagrangian equation with the recession parameter is:

$$Ł = [\,a_1L^p + (a_2 + b_2R)v^p + (a_3 + b_3R)D^p + (1 - a_1 - a_2 - a_3)C^p]^{1/p} – \lambda\,[w\,(1- L - v) – D + Y – C]]$$

The first-order conditions yield:

1. v: $(a_2 + b_2R)v^{p-1}\,[a_1L^p + (a_2 + b_2R)v^p + (a_3 + b_3R)D^p + (1 - a_1 - a_2 - a_3)C^p]^{(1-p)/p} + \lambda w = 0$

2. L: $a_1 L^{p-1}\,[a_1 L^p + (a_2 + b_2 R)v^p + (a_3 + b_3 R)D^p + (1 - a_1 - a_2 - a_3)C^p]^{(1-p)/p} + \lambda w = 0$
3. D: $(a_3 + b_3 R)D^{p-1}\,[a_1 L^p + (a_2 + b_2 R)v^p + (a_3 + b_3 R)D^p + (1 - a_1 - a_2 - a_3)C^p]^{(1-p)/p} + \lambda = 0$
4. C: $(1 - a_1 - a_2 - a_3)C^{p-1}\,[a_1 L^p + (a_2 + b_2 R)v^p + (a_3 + b_3 R)D^p + (1 - a_1 - a_2 - a_3)C^p]^{(1-p)/p} + \lambda = 0$
5. λ : w(1- L - v) – D + Y – C = 0

Solving for the first order conditions:

a) Using equations 3 & 4:

$$D = C\left(\frac{1 - a_1 - a_2 - a_3}{a_3 + b_3 R}\right)^{1/(p-1)}$$

b) Using equations 1 & 2:

$$L = v\left(\frac{a_2 + b_2 R}{a_1}\right)^{1/(p-1)}$$

c) Using equations 1 & 4:

$$v = C\left[\frac{(1 - a_1 - a_2 - a_3)}{a_2 + b_2 R}\right]^{\frac{1}{p-1}}$$

Now, using equation a) to simply c)

$$v = D\left[\frac{a_3 + b_3 R}{a_2 + b_2 R}\right]^{\frac{1}{p-1}}$$

Substituting a), b) and d) into equation 5 and simplifying:

$$v^* = (w + Y)\left[\left(\frac{1}{w}\left(\frac{a_1}{a_2 + b_2 R}\right)^{\frac{1}{p-1}}\right) + \left(\frac{(1 - a_1 - a_2 - a_3)(a_3 + b_3 R)}{(a_2 + b_2 R)[(1 - a_1 - a_2 - a_3) - (a_3 + b_3 R)]}\right)^{\frac{1}{p-1}} + \frac{1}{w}\right]$$

Where v^* is the optimal hours of volunteer for an individual.

Substituting this into b

$$L^* = (w+Y)[\frac{1}{w} + \left(\frac{1}{w}\left(\frac{a_2 + b_2R}{a_1}\right)^{\frac{1}{p-1}}\right) + \left(\frac{(1-a_1-\square_2-a_3)(a_3+b_3R)}{[a_1[(1-a_1-a_2-a_3)-(a_3+b_3R)]]}\right)^{\frac{1}{p-1}}]$$

Where L^* is the optimal hours of leisure for an individual.

Similarly, solving for the remaining variables

$$C^* = (w+Y)[\left(\frac{1}{w}\left(\frac{a_1-(a_2+\square_2R)}{(1-a_1-a_2-a_3)}\right)^{\frac{1}{p-1}}\right) + \left(\frac{(a_3+b_3R)}{[(1-a_1-a_2-a_3)-(a_3+b_3R)]}\right)^{\frac{1}{p-1}}]$$

Where C* is the optimal value of consumption for an individual.

$$D^* = (w+Y)[\left(\frac{1}{w}\left(\frac{a_1-(a_2+b_2R)}{(a_3+b_3R)}\right)^{\frac{1}{p-1}}\right) + \left(\frac{(1-a_1-a_2-a_3)}{[(1-a_1-a_2-a_3)-(a_3+b_3R)]}\right)^{\frac{1}{p-1}}]$$

Where D* is the optimal hours of donations for an individual.

We perform comparative statics on the results of the model, for the purpose of testing the accuracy of the model through our empirical analysis. We will only concentrate on donations and volunteer hours because analysis of consumption and leisure hours has been extensive over the years.

Fall in wages (w)

Given that solutions to the model for optimal volunteer hours and donations supplied are complicated, we cannot make predictions about the direction of donations and volunteer hours without making assumptions surrounding p, b_2 and b_3, since the variable w will be present in more than one term of the derivative.

Fall in non-wage income (Y)

The derivative of v* and D* with respect to household income (Y) is positive. Therefore, a fall in income will decrease volunteer hours and donation activity. This confirms Freeman's (1997) conclusion that people with higher income volunteer and donate more and can be interpreted as extrinsic motivations dominating intrinsic motivations of an individual.

Presence of a recession (R = 1)

Since we are unaware of the direction of the coefficients b_2 and b_3, and are interested in determining those directions through empirical analysis, we cannot determine the correlation between a recession and donation activity or volunteer behaviour until the values of b_2 and b_3 are confirmed.

In order to conduct a concrete comparative static investigation, we will consider a specific case of the constant elasticity of substitution model – the Cobb-Douglas multivariate utility model with constant returns to scale.

Let us define the Cobb-Douglas Utility function as:

$$\text{U(L,v,C,D)} = L^{a_1} v^{a_2+b_2R} D^{a_3+b_3R} C^{(1-a_1-a_2-b_2R-a_3-b_3R)}$$

Our Lagrangian equation with this utility function is:

$$Ł = \left[L^{a_1} v^{a_2+b_2R} D^{a_3+b_3R} C^{(1-a_1-a_2-b_2R-a_3-b_3R)}\right] - \lambda\,[\text{w}\,(1-\text{L}-\text{v}) - \text{D} + \text{Y} - \text{C}]$$

The first-order conditions yield:

1. v: $(a_2 + b_2R)\left[L^{a_1} v^{a_2+b_2R-1} D^{a_3+b_3R} C^{(1-a_1-a_2-b_2R-a_3-b_3R)}\right] + \lambda w = 0$
2. L: $a_1\left[L^{a_1-1} v^{a_2+b_2R} D^{a_3+b_3R} C^{(1-a_1-a_2-b_2R-a_3-b_3R)}\right] + \lambda w = 0$
3. D: $(a_3 + b_3R)\left[L^{a_1} v^{a_2+b_2R} D^{a_3+b_3R-1} C^{(1-a_1-a_2-b_2R-a_3-b_3R)}\right] + \lambda = 0$
4. C:$(1 - a_1 - a_2 - b_2R - a_3 - b_3R)\left[L^{a_1} v^{a_2+b_2R} D^{a_3+b_3R} C^{(-a_1-a_2-b_2R-a_3-b_3R)}\right] + \lambda = 0$
5. λ: w(1- L - v) – D + Y – C = 0

Solving for the first order conditions:

$$L = \left(\frac{a_1}{a_2 + b_2R}\right) v$$

$$D = \frac{a_3 + b_3R}{1 - a_1 - a_2 - b_2R - a_3 - b_3R} C$$

$$v = \frac{(a_2 + b_2 R)}{w(1 - a_1 - a_2 - b_2 R - a_3 - b_3 R)} C$$

Simplifying further:

$$v = \frac{(a_2 + b_2 R)}{w(a_3 + b_3 R)} D$$

Substituting these results into equation 5)

$$v^* = \frac{w + Y}{w}[a_2 + \square_2 R]$$

$$L^* = \frac{w + Y}{w}[a_1]$$

$$C^* = (w + Y)[1 - a_1 - a_2 - b_2 R - a_3 - b_3 R]$$

$$D^* = (w + Y)[a_3 + b_3 R]$$

The following section will highlight the results of the comparative static analysis of the Cobb-Douglas model.

Fall in wages (w)

A fall in wages will cause consumption and donation activity to fall. This is consistent with our economic intuition as lower wages means the individual has less available wealth to spend on these activities and confirms Freeman's (1997) conclusion that individuals with higher wages will donate more. Furthermore, leisure will increase with a fall in wages as the opportunity cost of not working an extra hour has reduced. Finally, volunteer hours will increase with a fall in wages because the opportunity cost of volunteering directly corresponds to the wage rate. This indicates that at a higher wage, the opportunity cost of volunteering is higher, thus individuals earning higher wages will volunteer less. This result implies that extrinsic motivations compelling an individual will outweigh intrinsic motivations.

Fall in non-wage income (Y)

The derivative of v*, D*, L*, and C* with respect to household income (Y) is positive. Therefore, a fall in income will decrease volunteering, donation activity, consumption and time spent pursuing leisure. This confirms that fact that people with higher income tend to be more involved in philanthropic activity, and can be interpreted as extrinsic motivations dominating intrinsic motivations of an individual, which is consistent with the findings of our previous model.

Presence of a recession (R = 1)

The individual's optimal choice of leisure will remain independent during a recession or period of growth. Furthermore, by making the assumption that the value of b_2, b_3 is positive, the optimal consumption level will decrease, volunteer hours will increase, and donation activity will increase. By making this assumption, we are hypothesizing that intrinsic motivations outweigh external pressures.
Contrarily, if $b_2 < 0$ and $b_3 < 0$, consumption increases, while volunteer hours and donations decrease. In other words, during a recession, individuals will substitute consumption for donations and leisure for volunteer hours and because the utility from volunteering and donations decreases during a recessionary period, extrinsic motivations dominate.

We hope that through our empirical analysis we can determine the value of b_2 and b_3 – if they are positive, negative or negligible. We know from our model that in general, extrinsic motivations dominate because people with higher wages will volunteer less. Through empirical analysis, we will determine the value of b_2, b_3 and observe if there are any motivational changes during a recession. If the results show that b_2, $b_3 > 0$, the model implies that intrinsic motivations are dominant during a recessionary period.

Empirical Analysis

Data

The purpose of the empirical portion of our analysis is to determine the accuracy of the model developed above and determine whether the comparative statics highlighted earlier are of any significance in the data. In order to determine this relationship, we have compiled State-level data for the variables included in our model and have run a random effects GLS regression. In order to ensure we have significant observations to perform an accurate empirical analysis, we developed a panel dataset for each of the 50 United States for the years from 2007 to 2009, which falls before and during the recession referred to as the "Financial Crisis". Therefore, our data set includes 150 observations over three years.

Our recession variable focuses on whether a particular state in each period was experiencing a recession rather than the entire nation due to issues regarding data availability. Since the United States had not experienced a recession between 2001 and 2007, including further data points in our regression becomes cumbersome as our regression variable for the majority of the data points for the period would obtain a value of 0 and there would not be adequate variation to run a fixed effect regression. By focusing on the state level and three years of statistics, we are able to obtain sufficient observations and variation in order to ensure accurate analysis.

Our data was collected through numerous U.S. governmental sources. Wage and labour hour data was collected through the Bureau of Labour Statistics' Current Employment Statistics Program. This program surveys approximately 141,000 businesses and

government agencies each month to provide data relating to nonfarm payroll workers. Household income data was taken from the American Community Survey developed by the U.S. Census Bureau. This survey is collected from a sample of the population in the United States and represents survey estimates. Donation information was collected by the National Center for Charitable Statistics with data released by the Internal Revenue Service called the "Statistics of Income Bulletin". The data published represents data selected from taxpayer's tax returns. One issue with this data is that some donations are excluded, as only returns with itemized donations appear. According to the National Center for Charitable Statistics, 33 percent of U.S. taxpayers chose to itemize their deductions on their tax returns meaning that the majority of American's use the standard deduction. However, according to The Center on Philanthropy at Indiana University 2012, it was estimated that in 2009, total U.S. giving was $227.41 billion compared to $157.2 billion in itemized contributions. This represents nearly 70 percent of all giving, and therefore it can be concluded that this dataset will provide adequate information on state-level donation activity. Volunteer hour data was collected through the publication, "Volunteering and Civic Life in America", which gathered information through a supplement to the Current Population Survey: the Volunteer Supplement and the Civic Supplement.

The Current Population survey is distributed monthly and surveys 60,000 households. The dataset defines volunteers as "individuals who performed unpaid volunteer activities through or for an organization at any point during the 12-month period." There is currently no available state-level consumption data and therefore a proxy must be used for the consumption variable. In research surrounding wealth and consumption data at the state level conducted by Xia Zhou (2010), he concluded that retail sales per state represent a statistically significant proxy for consumption data. Therefore, our data set uses retail sales per capita as a proxy for consumption level data.

To determine whether each state was suffering from a recessionary period, the percentage change in GDP for the year was determined. If the percentage change was negative, then a recession exists and if the change was zero or positive, the state was not suffering from a recession. Given that our determination of a recessionary period involves the percentage change for the entire year, we understand that this does not necessary align with the formal definition of a recession. We were unable to obtain percentage change information at a state-level for the last two quarters of each year, in order to accurately determine whether at year end there existed a recession.

Regression Equation

The variables used in this dataset along with summary statistics are found in appendix A. Stateid includes a range from 1 to 50 and represents each United State. It should be noted that the District of Columbia is not included in the analysis as data pertaining to numerous variables were not available. Included in our regression are three dummy variables: recession, y08, and y09. If the state in one of the three years was determined to be suffering from a recessionary period, then the observation would

include a 1 under the recession variable, and 0 otherwise. If the observation was taken during 2008, then the data entry would consist of a 1 for that observation and if it were during 2007 or 2009, it would be 0. The same logic is employed for the dummy variable y09. For example, if Michigan were in a recession in 2007, then in the regression, the recession dummy variable, R, would equal 1. If Texas were not experiencing a recession for the same year, then R would equal 0 for that particular data point.

Variable labourhrs, leisure and volunteerhrs represent the number of hours an individual spent working, pursuing leisure activities and volunteering, respectively. We implemented a time endowment for the purposes of the empirical analysis of 168 hours, which represents the number of hours during a week. Therefore, each variable represents the number of hours spent pursuing that variable per week.

In order to obtain more statistically significant results, we also ran a regression featuring the natural logarithm of each variable. This is represented in the dataset bya "ln" before each variable name. The natural logarithm of variables are used because this allows the data to achieve a normal distribution as the volunteer hours, wages, income, leisure and consumption take on negative values. Without natural logarithm, the data is truncated at 0. Additionally, the natural logarithm demonstrates percentage changes, whereas the unadjusted value only shows absolute changes. Since absolute changes in volunteering and donations may be very small, and thus not statistically significant, using the natural logarithm allows even small changes to be accounted for in our analysis. Finally, the function we are interested in, the Cobb-Douglas/Constant Elasticity function, is non-linear which is problematic for our empirical analysis. The natural logarithm corrects this issue as it linearizes the function and allows us to run the random effects regression.

The regression equations that we are interested in include:

$$\text{ln\_volunteerhrs} = \beta_1 + \beta_2 \text{ln\_donations} + \beta_3 \text{recession} + \beta_4 \text{ln\_wage} + \beta_5 \text{ln\_income} + \beta_6 \text{ln\_leisure} + \beta_7 \text{y08} + \beta_8 \text{y09} + \beta_9 \text{ln\_consumption} + u$$

$$\text{ln\_donations} = \beta_1 + \beta_2 \text{ln\_volunteerhrs} + \beta_3 \text{recession} + \beta_4 \text{ln\_wage} + \beta_5 \text{ln\_income} + \beta_6 \text{ln\_leisure} + \beta_7 \text{y08} + \beta_8 \text{y09} + \beta_9 \text{ln\_consumption} + u$$

Discussion of Findings

The regression output for each of the above equations can be found in Appendix B. A summary is presented below:

Independent Variable	Coefficient (Standard Error) Dependent Variable	
	ln_donations	*ln_volunteerhrs*
ln_donations	-	.0664 (.1142)
ln_volunteerhrs	.0324 (.0530)	-
ln_income	-0.2561 (.1981)	.5169 (.2987)**
ln_wage	-0.0451 (.2509)	-0.4316 (.3732)
recession	-0.0292 (.0141)*	-0.0125 (.0253)
ln_consumption	.0346 (.1765)	.0242 (.2499)
ln_leisure	.1536 (1.659)	-7.5108 (2.5345)*
y08	-0.0344 (.1454)*	-0.0406 (.0252)
y09	-0.0693 (.0216)	.0304 (.0363)
constant	10.027 (8.2152)	31.3191 (12.615)*

** statistically significant at the 5% level*

***statistically significant at the 10% level*

We cannot reject the null hypothesis that a recession does not have an effect on volunteer hours due to the p-value of 0.819 and t-statistic of -0.23. As such, the coefficient on volunteer hours that was developed in our theoretical model (b_2) is nil. This finding is interesting as in our Cobb-Douglas model leisure is independent of a recession. If volunteer hours and leisure hours remain constant with the onset of a recession, then labour hours must also remain constant also for our time endowment to be satisfied. However, much of the literature surrounding the link between a recession and employment disputes this finding. According to Aliprantis (2012), for example, the average number of hours worked dramatically decreased in the United States during the most recent recession. Therefore, in our constant elasticity model, if hours worked decreases during a recession, and volunteer hours remain constant, then leisure must increase. If leisure is increasing then this would cause our model's coefficients to be $b_2 = 0$, $b_3 < 0$ and $p < 1$. We have confirmed that indeed $b_2 = 0$, $b_3 < 0$ from our empirical analysis, which is discussed below. Hence, leisure must increase during the recession to ensure volunteer hours remain constant when assuming $p < 1$. In fact, in a study conducted by Aguigar, Hurst and Karabarbounis (2012) it was determined that the decrease in work hours is largely offset by an increase in leisure hours during a recessionary period. Thus, this is evidence that our model is an accurate depiction of the observed phenomenon in the volunteer sector.

The statistically significant results for the relationship between leisure and volunteer hours are consistent with intuition. Since time endowment is fixed, and we assume hours worked to be constant, an increase in leisure should result in a fall in volunteer hours. An interesting observation, however, is that an increase in leisure by 1 percent leads to a fall in volunteer hours by nearly 7.5 percent, suggesting that individuals value leisure more than volunteer hour. This provides further evidence that extrinsic motivations dominate intrinsic motivations.

Our regression also indicates that the relationships between wage and volunteer hours and wage and donations are insignificant. This is important to our analysis as our hypothesis was heavily influenced by behaviours that are a function of changes in wage levels. Since our model only considers the opportunity costs placed upon an individual, then this insignificant result in the regression output may be due to the fact that people with higher wages are more likely to be asked to volunteer and are under greater social pressure to volunteer, causing the effect of wages to be nil.

From our regression equation using ln_volunteerhrs as our dependent variable, we also find ln_income to positively affect the number of volunteer hours supplied by an individual. The coefficient on ln_income is 0.517 with a standard error of 0.299. The p-value pertaining to the coefficient is 0.084, thus allowing us to determine that the natural logarithm of income is statistically significant at the 90 percent accuracy level. Therefore, ceteris paribus, individuals with greater household income will supply more volunteer hours. This is consistent with our model's findings.

Moreover, with donation activity representing the dependent variable, the recession parameter is statistically significant with a coefficient of -.029, which demonstrates that a recession results in a 2.9 percent decrease in the level of donations per individual. This finding brings us to the conclusion that extrinsic motivations outweigh intrinsic motivations: greater need for non profit goods and services in society as a result of a recessionary period does not motivate individuals to increase donation activity. The coefficient b_3 developed in our theoretical model must be negative: the presence of a recession causes donation activity to decrease, which requires a negative value of b_3, the coefficient of R relating to Donations in our model, in order to decrease utility.

We are also interested in determining the relationship between volunteer behaviour and donation activity. Using a standard random effects regression equation, shown below, we find that an increase in donations only results in a negligible increase in volunteer activity. This is demonstrated by a coefficient of 0.00038 on the donation variable and a p-value of 0.076. Therefore, the effect is only statistically significant at the 90 percent level. This allows us to conclude that donation activity and volunteer behaviour do not have a significant relationship.

Regression Equation:

$$\text{volunteerhrs} = \beta_1 + \beta_2 \text{donations} + \beta_3 \text{recession} + \beta_4 \text{wage} + \beta_5 \text{income} + \beta_6 \text{leisure} + \beta_7 \text{y08} + \beta_8 \text{y09} + \beta_9 \text{consumption} + u$$

If we use donations as the dependent variable when testing the relationship between donation activity and volunteer time, we find that the coefficient on volunteer hours is 551.7. Therefore, an increase in volunteer hours per week by one hour will increase monetary donations by $551 per individual. The standard error of the coefficient is 315.9 and the p-value is 0.081, allowing us to conclude that at a 90 percent significance level, volunteer hours will have a positive effect on donation activity. This regression was run using the following equation:

$$\text{donations} = \beta_1 + \beta_2 \text{volunteerhrs} + \beta_3 \text{recession} + \beta_4 \text{wage} + \beta_5 \text{income} + \beta_6 \text{leisure} + \beta_7 \text{y08} + \beta_8 \text{y09} + \beta_9 \text{consumption} + u$$

In order to relate these relationships between donations and volunteer hours to business cycles, we are interested in how the elasticity between the two variables changes from 2007 to 2009 – before and during the most recent recession. By running two separate regressions for 2007 and 2009, we find that in 2007, a $100 dollar increase in charitable giving increases volunteer hours per week by 0.004 or 0.2 hours per year. This has a p-value of 0.1 and a t-statistic of 1.68. This confirms the existing literature on the complementary relationship between donations and volunteering hours. In 2009, a $100 dollar increase in charitable giving's increases volunteer hours per week by 0.006 or 0.3 hours per year. However, this result is statistically insignificant with a p-value of 0.121 and a t-statistic of 1.58. This implies that during a recession, there is no relationship between donations and volunteer hours – they are neither complimentary nor substitutable. Therefore, this confirms the observed phenomena in our empirical work. Even though donations decrease during hard times, volunteer behaviour remain constant despite the expectation that volunteering might decrease due to the complementarity relationship during a boom period.

The regression outputs for the above equations can be found in appendix B.

Robustness

Since there exists a possibility for the explanatory variables such as donation activity, income and wage to be correlated with an omitted variable that is hard to quantify, such as recognition achieved from philanthropic activity, it is beneficial to perform the previous regression equations using a fixed effects model. This model allows us to control for some of the omitted variable bias that may occur in the random effects as a result of correlated variables. To reduce the amount of bias, the omitted variable must have time-invariant values. Recognition tends to change in response to changes in socio-economics status, so this variable may not be truly time-invariant. However, since our study is based solely on a three-year period, we can safely conclude that the recognition

achieved through volunteering and donation activity would not fluctuate substantially throughout this period, as recognition in society takes time to develop in individuals.

The fixed effects model was used with ln_volunteerhrs and ln_donations as the dependent variables for the two regressions equations mentioned earlier, and the regression output can be found in Appendix C. Here is a summary for comparison purposes:

Independent Variable	**Coefficient (Standard Error) Dependent Variable**			
	ln_donations		*ln_volunteerhrs*	
	Random Effects	Fixed Effects	Random Effects	Fixed Effects
ln_donations	-	-	.0664 (.1142)	.2046 (.2017)
ln_volunteerhrs	.0324 (.0530)	.0540 (.0533)	-	-
ln_income	-0.2561 (.1981)	.1094 (.2388)	.5169 (.2987)**	-.2071 (.4647)
ln_wage	-0.0451 (.2509)	.2534 (.3086)	-0.4316 (.3732)	-.8031 (.5969)
recession	-0.0292 (.0141)*	-.0222 (.0130)**	-0.0125 (.0253)	-.0120 (.0257)
ln_consumption	.0346 (.1765)	.1298 (.1977)	.0242 (.2499)	-.1691 (.3852)
ln_leisure	.1536 (1.659)	3.2373 (1.6944)**	-7.5108 (2.5345)*	-11.074 (3.157)*
y08	-0.0344 (.1454)*	-.0495 (.0142)*	-0.0406 (.0252)	-.0158 (.0294)
y09	-0.0693 (.0216)	-.0854 (.0215)*	.0304 (.0363)	.0436 (.0450)
constant	10.027 (8.2152)	-10.817 (9.112)	31.3191 (12.615)*	58.433 (16.795)*

** statistically significant at the 5% level*

***statistically significant at the 10% level*

Focusing on the regression using ln_volunteerhrs as the dependent variable first, we find that the coefficient on the recession variable does not change significantly from the random effects model. We are interested in the significant change in the coefficient on ln_income between the two models. Under the random effects model, we found that volunteer hours and household income were positively correlated with a coefficient of 0.517 and a p-value of 0.084. Under the fixed effects model, we found that an increase in household income would decrease the amount of volunteer hours contributed by 21 percent, however this is statistically insignificant with a p-value of 0.657. The significant difference in the effect of ln_income between the fixed effects model and the random-

effects model, suggests the potential for correlation between omitted variables and the level of household income. The fixed effects model, therefore, may be more representative for the purposes of our analysis, as the random effects model used previously includes a bias in the positive direction. However, since the focus of our analysis is to discover the relationship between the dependent variables (volunteer hours and donations), the model chosen is not particularly concerning, as the change in the coefficient and significance on the recession variable is negligible.

When using ln_donations as the dependent variable and running the two models, we find that the change in the coefficient on the recession variable is minimal, changing from -0.029 under the random effects model to -0.022 under the fixed effects model. The fixed effects model causing the significance level to decrease to 10 from 5 percent in the random effects model. The coefficient on ln_income changes from being negatively correlated with donation activity in the random effects model to being positively correlated with donation activity under the fixed effects model. This may also indicate bias in the random effects model however, both values still remain statistically insignificant. The difference observed between the significance levels and values of the coefficient on leisure is important. Under the RE model, we determined that this variable was statistically insignificant with a p-value of 0.926. Under the FE model, the p-value becomes significant at the 10 percent level (p-value of .059) and the coefficient increases by a multiple of 21, to 3.24. This implies that leisure and donations are positively correlated. This result may be explained by the fact that individuals who value leisure more will volunteer less and compensate this lack of volunteering with donations.

Conclusion

Our analysis shows that during a recession, individuals become less altruistic, demonstrated by a shift in motivations towards extrinsic motivations dominating intrinsic motivations. This allows us to interpret the fall in donations during a recession as a result of individuals' attempts to maintain their level of consumption in the face of lower wages and higher unemployment. During a recession, people substitute consumption for donation.

This effect is not observed with volunteer hours. During a recession, the average hours worked tends to decrease because of lower demand for labour. Under the extrinsic motivation framework, which is dominant in a recession, leisure increases because individuals gain more utility from leisure than volunteering, but volunteer hours remain constant. During a recession, volunteer hours and donations are not complementary as they are during a pre-recessionary period. As a result, a fall in donations does not result in a fall in volunteer hours.

These results have significant policy implications. Since demand for volunteering and the level of donations increases during a recession, and the supply of volunteer hours and donations do not increase to compensate for the higher demand, a shortage will exist in the non-profit sector. In order to achieve equilibrium, the government should implement

policies that will alter the influence of extrinsic motivations on individuals. The government will have to reduce the opportunity cost of volunteering and donations, such as through tax cuts or subsidies, and increase the recognition received from volunteering and donating by presenting these activities as moral obligation and promoting awareness of the subject.

A future direction of study in this topic will be observation of the effect of tax rates on volunteering during a recession and determining the optimal tax rate that allows the donation and volunteer sector to clear during a recessionary period.

In this paper, we studied the opportunity cost of wages as the only extrinsic motivation. Discussing the existence of additional extrinsic motivations, such as the probability of being asked to volunteer, or the social pressures of volunteering, would provide a better understanding of the observed situation.

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Appendix A

Summary Statistics of the Dataset

Variable	Obs	Mean	Std. Dev.	Min	Max
stateid	150	25.5	14.47921	1	50
labourhrs	150	34.43333	1.106216	31.2	37.3
recession	150	.48	.5012735	0	1
wage	150	20.99113	2.609591	16.27	27.81
volunteerhrs	150	.7288	.206085	.39	1.93
donations	150	3544.533	973.649	2000	7600
income	150	51372.62	8554.96	36646	70759
leisure	150	132.8385	1.123602	130.23	135.83
year	150	2008	.8192319	2007	2009
y08	150	.3333333	.4729838	0	1
y09	150	.3333333	.4729838	0	1
consumption	150	15317.73	1979.713	12354	23369
ln_labourhrs	150	3.538511	.0321817	3.440418	3.618993
ln_wage	150	3.036618	.1220952	2.789323	3.325396
ln_volunte~s	150	-.3491665	.2454752	-.9505239	.6549259
ln_donations	150	8.139979	.2528655	7.600903	8.935904
ln_income	150	10.83348	.1631812	10.50906	11.16704
ln_leisure	150	4.889097	.0084571	4.869308	4.91141
ln_consump~n	150	9.629023	.1229184	9.421741	10.05917

Appendix B – Random Effects Model

```
. xtreg ln_donations ln_volunteerhrs recession ln_wage ln_income ln_leisure y08 y09 ln_consumption

Random-effects GLS regression                   Number of obs      =       150
Group variable: stateid                         Number of groups   =        50

R-sq:  within  = 0.4015                         Obs per group: min =         3
       between = 0.1221                                        avg =       3.0
       overall = 0.1240                                        max =         3

                                                Wald chi2(8)       =     61.36
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

ln_donations	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ln_volunteerhrs	.0323801	.0530453	0.61	0.542	-.0715867	.1363469
recession	-.0291992	.0141032	-2.07	0.038	-.0568411	-.0015574
ln_wage	-.0451352	.2508571	-0.18	0.857	-.536806	.4465357
ln_income	-.2560638	.1980742	-1.29	0.196	-.6442822	.1321546
ln_leisure	.1535512	1.658884	0.09	0.926	-3.097802	3.404905
y08	-.0344238	.0145402	-2.37	0.018	-.062922	-.0059255
y09	-.0692994	.0216086	-3.21	0.001	-.1116514	-.0269473
ln_consumption	.0346057	.17654	0.20	0.845	-.3114064	.3806177
_cons	10.02705	8.215247	1.22	0.222	-6.074537	26.12864
sigma_u	.19584436					
sigma_e	.05434981					
rho	.92849239	(fraction of variance due to u_i)				

```
. xtreg ln_volunteerhrs ln_donations recession ln_wage ln_income ln_leisure y08 y09 ln_consumption

Random-effects GLS regression                   Number of obs      =       150
Group variable: stateid                         Number of groups   =        50

R-sq:  within  = 0.1960                         Obs per group: min =         3
       between = 0.0771                                        avg =       3.0
       overall = 0.0946                                        max =         3

                                                Wald chi2(8)       =     27.08
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0007
```

ln_volunteer~s	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
ln_donations	.0664394	.1142388	0.58	0.561	-.1574645	.2903432
recession	-.0124698	.0253277	-0.49	0.622	-.0621111	.0371716
ln_wage	-.431629	.3732436	-1.16	0.248	-1.163173	.299915
ln_income	.5168527	.2987206	1.73	0.084	-.068629	1.102334
ln_leisure	-7.510794	2.534495	-2.96	0.003	-12.47831	-2.543275
y08	-.0406417	.0252488	-1.61	0.107	-.0901284	.0088451
y09	.0303805	.0363498	0.84	0.403	-.0408637	.1016248
ln_consumption	.0241685	.2499258	0.10	0.923	-.4656771	.514014
_cons	31.31908	12.61537	2.48	0.013	6.593411	56.04476
sigma_u	.21906483					
sigma_e	.10575259					
rho	.81100149	(fraction of variance due to u_i)				

```
. xtreg volunteerhrs donations income wage leisure consumption y08 y09 recession

Random-effects GLS regression                   Number of obs      =       150
Group variable: stateid                         Number of groups   =        50

R-sq:  within  = 0.2380                         Obs per group: min =         3
       between = 0.1041                                        avg =       3.0
       overall = 0.1176                                        max =         3

                                                Wald chi2(8)       =     34.76
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

volunteerhrs	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
donations	.000038	.0000214	1.77	0.076	-4.00e-06	.0000801
income	7.20e-06	4.56e-06	1.58	0.114	-1.74e-06	.0000161
wage	-.0125881	.0141691	-0.89	0.374	-.040359	.0151829
leisure	-.0550665	.0140224	-3.93	0.000	-.0825498	-.0275832
consumption	1.51e-06	.0000117	0.13	0.898	-.0000215	.0000245
y08	-.0241326	.0177128	-1.36	0.173	-.0588491	.0105839
y09	.0347157	.0264539	1.31	0.189	-.0171331	.0865644
recession	.0018806	.0176948	0.11	0.915	-.0328005	.0365617
_cons	7.775592	1.847302	4.21	0.000	4.154946	11.39624
sigma_u	.18798508					
sigma_e	.07390691					
rho	.86612384	(fraction of variance due to u_i)				

```
. xtreg donations volunteerhrs income wage leisure consumption y08 y09 recession

Random-effects GLS regression                   Number of obs      =       150
Group variable: stateid                         Number of groups   =        50

R-sq:  within  = 0.3062                         Obs per group: min =         3
       between = 0.1430                                        avg =       3.0
       overall = 0.1470                                        max =         3

                                                Wald chi2(8)       =     44.83
corr(u_i, X)   = 0 (assumed)                    Prob > chi2        =    0.0000
```

donations	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
volunteerhrs	551.7097	315.913	1.75	0.081	-67.46847	1170.888
income	-.0137696	.0176054	-0.78	0.434	-.0482756	.0207364
wage	-36.72608	54.53253	-0.67	0.501	-143.6079	70.1557
leisure	8.505324	55.64511	0.15	0.879	-100.5571	117.5677
consumption	-.0183537	.0453568	-0.40	0.686	-.1072514	.0705439
y08	-103.8556	64.61585	-1.61	0.108	-230.5003	22.78913
y09	-254.2313	96.90552	-2.62	0.009	-444.1627	-64.3
recession	-82.75956	63.86504	-1.30	0.195	-207.9327	42.41362
_cons	3931.14	7383.397	0.53	0.594	-10540.05	18402.33
sigma_u	748.54279					
sigma_e	249.27585					
rho	.90017194	(fraction of variance due to u_i)				

Regression Output Using Strictly 2007 Data:

```
. reg volhours donations
```

Source	SS	df	MS	Number of obs =	50
				F(1, 48) =	2.82
Model	.098579393	1	.098579393	Prob > F =	0.0997
Residual	1.67933266	48	.034986097	R-squared =	0.0554
				Adj R-squared =	0.0358
Total	1.77791205	49	.036283919	Root MSE =	.18705

volhours	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
donations	.0000422	.0000251	1.68	0.100	-8.35e-06	.0000928
_cons	.6008691	.0970451	6.19	0.000	.4057467	.7959914

Regression Output using strictly 2009 data:

```
. reg volhours donations
```

Source	SS	df	MS	Number of obs =	50
				F(1, 48) =	2.49
Model	.124461548	1	.124461548	Prob > F =	0.1212
Residual	2.40034028	48	.050007089	R-squared =	0.0493
				Adj R-squared =	0.0295
Total	2.52480183	49	.051526568	Root MSE =	.22362

volhours	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
donations	.0000579	.0000367	1.58	0.121	-.0000159	.0001317
_cons	.5221918	.1284506	4.07	0.000	.2639245	.7804591

Appendix C: Fixed Effects Model

```
. xtreg ln_volunteerhrs y08 y09 recession ln_wage ln_income ln_leisure ln_consumption ln_donations, fe

Fixed-effects (within) regression               Number of obs      =       150
Group variable: stateid                         Number of groups   =        50

R-sq:  within  = 0.2339                         Obs per group: min =         3
       between = 0.0003                                        avg =       3.0
       overall = 0.0007                                        max =         3

                                                F(8,92)           =      3.51
corr(u_i, Xb)  = -0.6525                        Prob > F          =    0.0014
```

ln_volunteer~s	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
y08	-.0158362	.029416	-0.54	0.592	-.0742589	.0425866
y09	.0435883	.0449689	0.97	0.335	-.0457239	.1329005
recession	-.0119467	.0257028	-0.46	0.643	-.0629947	.0391012
ln_wage	-.8030737	.5968707	-1.35	0.182	-1.98851	.382363
ln_income	-.2070615	.4646656	-0.45	0.657	-1.129927	.7158046
ln_leisure	-11.0739	3.15724	-3.51	0.001	-17.34446	-4.803354
ln_consumption	-.1690625	.3851666	-0.44	0.662	-.9340365	.5959116
ln_donations	.2046077	.2017366	1.01	0.313	-.1960585	.6052739
_cons	58.43295	16.79478	3.48	0.001	25.07707	91.78882
sigma_u	.30674558					
sigma_e	.10575259					
rho	.89376912	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(49, 92) =    12.49                 Prob > F = 0.0000
```

```
. xtreg ln_donations y08 y09 recession ln_wage ln_income ln_leisure ln_consumption ln_volunteerhrs, fe

Fixed-effects (within) regression               Number of obs      =       150
Group variable: stateid                         Number of groups   =        50

R-sq:  within  = 0.4414                         Obs per group: min =         3
       between = 0.1240                                        avg =       3.0
       overall = 0.0498                                        max =         3

                                                F(8,92)            =      9.09
corr(u_i, Xb)  = -0.4801                        Prob > F           =    0.0000
```

ln_donations	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
y08	-.0495399	.0142336	-3.48	0.001	-.0778089	-.0212708
y09	-.0854326	.0214532	-3.98	0.000	-.1280406	-.0428247
recession	-.022168	.0130215	-1.70	0.092	-.0480299	.0036938
ln_wage	.253353	.3086269	0.82	0.414	-.3596067	.8663127
ln_income	.1093796	.2387927	0.46	0.648	-.3648833	.5836425
ln_leisure	3.237373	1.694408	1.91	0.059	-.1278675	6.602613
ln_consumption	.1297834	.1976947	0.66	0.513	-.2628553	.5224221
ln_volunteerhrs	.0540426	.0532842	1.01	0.313	-.0517845	.1598696
_cons	-10.81734	9.112177	-1.19	0.238	-28.91491	7.280236
sigma_u	.27861312					
sigma_e	.05434981					
rho	.96334162	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(49, 92) =    44.49                 Prob > F = 0.0000
```