# EXAMINATION OF THE UNEMPLOYMENT RATE AND THE GENERAL ASSISTANCE (GA) CASELOAD

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## ABSTRACT

This report investigates the extent to which the state of the labor market affects the General Assistance (GA) caseload. Being unemployed is one of the preconditions to be eligible for the GA program; still there is much uncertainty as to the relationship between the officially measured unemployment rate and the GA caseload. This paper provides theoretical explanation and empirical testing of how the unemployment rate might influence the pool of potential GA clients and develops a statistical model to test this relationship. The results of this study indicate that, as predicted by the theory, the growth rate of unemployment rate has a significant, positive impact on the growth rate of the GA caseload. In addition, we also find that the growth rate of the ratio of the total labor force to the total population has a negative impact on the growth rate of the GA caseload.

**Key words**: General Assistance (GA), unemployment rate, labor force

## INTRODUCTION

The GA program provides a small grant and medical coverage for those with temporary (3-12 months) or permanent (over 12 months) incapacities or disabilities that prevent them from working. The GA program experienced an increase in the growth rate in 2008 and 2009. This time period coincides with a weak labor market.

Intuitively, the labor market should have direct and indirect impact on the GA caseload. Firstly, there could be people who would qualify for GA but are employed in a good labor market. If these individuals become unemployed when the labor market weakens, they could end up on the GA program. Secondly, some individuals, with an incapacity that would qualify them to be on GA, may be living with a "caretaker" who is employed and provides financial support to them. A weak labor market could cause some of these caretakers to lose their jobs, and therefore they may no longer be able to afford to support others. Those being taken care of could then go to GA. Finally, one often loses health insurance with the loss of a job. If the currently unemployed and uninsured person develops a medical problem, he is less likely to get the needed treatment. The problem could further develop into an incapacity that would qualify the person for GA.

The rest of this paper is organized as follows. Section 2 develops a theoretical model of the above intuitive arguments. This model is then tested with recent data of unemployment rate and GA caseload in section 3. Section 4 discusses the potential of using the results in forecasting future GA caseload, and section 5 concludes the paper.

## THEORETICAL ANALYSIS

A precondition for one to be qualified for the GA program is that the individual is not working. This simple relationship is developed in the appendix into a mathematical representation of the relationship between the growth rate of GA and the growth rate of the number of people out of the population who are not working. There is no monthly measure, however, of the number of people who are not working to permit a direct empirical test of this hypothesis.

However, there are data that permit a less direct test of the hypothesis. There are two circumstances when an individual is not working. In the first case, an individual would like to work, but can't find a job. This person is counted as part of the official number of unemployed. The second case is of someone who is not working because they do not want to work or cannot work. This individual is not counted as part of the labor force. The total non-working population then consists of those in the labor force but unemployed and those not in the labor force. The structure of the total population is depicted in the following Figure 1.

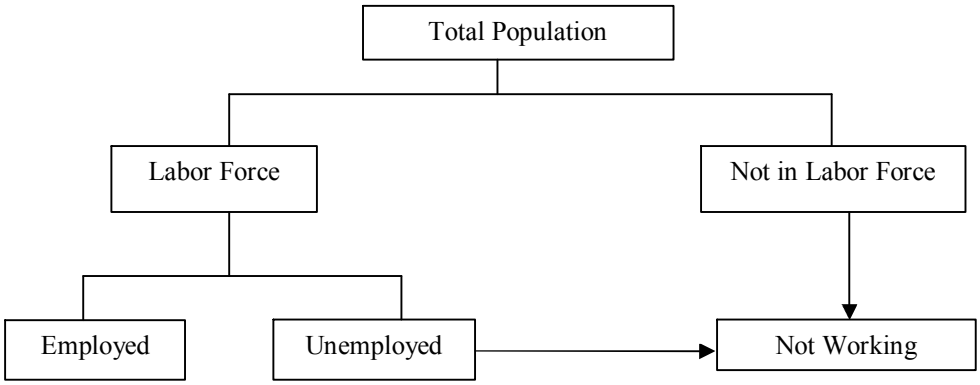


**FIGURE 1** – Structure of the Total Population

So, in equation form: Not working = officially unemployed plus those not in the labor force

There are official estimates of both the number of unemployed and of the labor force. A mathematical relationship is developed in the appendix between the percent of the population that is not working, the percent of the labor force that is not working (the unemployment rate), and the percent of the population that is in the labor force. These last two quantities are measurable and so can be used in the following statistical analysis to proxy for the percent of the population that is not working.

## DATA AND MODEL

GA caseload data was obtained from the CFC (Caseload Forecast Council) website. The data containing the labor force and the unemployment rate was taken from the Employment Security Department website. Finally, the population data was obtained from the Office of Financial Management. The data set ranges from January 1994 to April 2009, and there are a total of 184 observations.

In our model, changes in the unemployment rate and the labor force may have both immediate and lagged impacts on the growth rate of GA. For this reason, lagged growth rates are included. Furthermore, to capture the momentum of GA growth itself, we included lags of the growth rate of GA. Given that the data is seasonal, dummy variables are also included. Therefore, the statistical model is defined in Equation (1) below.

$$g_{ga,t} = \beta_0 + \sum_{i=1}^{p} \beta_i g_{ga,t-i} + \sum_{i=0}^{q} \gamma_i g_{u,t-i} + \sum_{i=0}^{h} \alpha_i g_{pop,t-i} + \sum_{i=0}^{m} \alpha_i g_{H,t-i} \sum_{i=1}^{11} s_{i,t} + d_{2001} + d_{2002} + \varepsilon_t \quad (1)$$

where $g_{ga,t}$ denotes the growth rate of the GA caseload, at time *t*, $g_{u,t}$ denotes the growth rate of the unemployment rate, at time *t*, $g_{H,t}$ denotes the growth rate of the ratio of the total labor force to the total population *H,* at time *t*, $g_{pop,t}$ denotes the growth rate of the population, at time *t*, $s_{i,t}$ is a dummy variable, at time *t*, which equals to 1 if the current month is month *i* and equals to 0 otherwise. The base month is December. $d_{2001}$ and $d_{2002}$ are two other dummy variables reflecting probable environmental and policy changes that affected GA during years prior to 2001 and in fiscal year 2002. The error term, $\varepsilon_t$, captures random errors and the influence of variables not included in the model.

## ESTIMATION AND EMPIRICAL RESULTS

The model estimated here has the maximum lag set to be 3 (i.e., three months to capture the possible lagged impact of the independent variables). Since we have included 21 independent variables, the model is estimated with backward selection so that the final model will not be overfitted. The estimation result is presented in the following Table 1:

| Variable | Parameter Estimate | F Value | Pr>F |
|---|---|---|---|
| Intercept | 0.00394 | 7.7 | 0.0061 |
| Second lag of the growth rate of the GA caseload | 0.19593 | 8.54 | 0.0039 |
| Third lag of the growth rate of the GA caseload | 0.23808 | 12.2 | 0.0006 |
| First lag of the growth rate of the unemployment rate | 0.04636 | 20.69 | <.0001 |
| March dummy | 0.01378 | 28.11 | <.0001 |
| April dummy | -0.00496 | 2.94 | 0.0882 |
| July dummy | -0.00587 | 3.59 | 0.06 |
| September dummy | -0.00895 | 7.02 | 0.0088 |
| October dummy | 0.01522 | 23.42 | <.0001 |
| Year prior to 2001 dummy | -0.00467 | 8.62 | 0.0038 |
| Fiscal year 2002 dummy | -0.0074 | 5.66 | 0.0185 |
| The growth rate of the ratio of total labor force to total population | -0.50284 | 9.74 | 0.0021 |
| First lag of the growth rate of the total labor force to total population ratio | -0.48809 | 7.92 | 0.0055 |

**TABLE 1** – Model Estimation Result

We find that, as the theory predicts, the growth rate of the unemployment rate has a significant positive impact on the future GA caseload growth rate. Likewise, the coefficient on the growth rate of the ratio of total labor force to total population *H* is negative and significant, as is predicted. The lagged growth rates of the GA caseload also have a positive impact on its current growth. This reflects some persistence in growth of GA. The seasonal pattern is captured well by the seasonal dummy variables. For example, GA usually has a higher growth rate in March, and this is identified by the significant coefficient with a magnitude of 0.01378.

## FORECASTING GA CASELOAD

The empirical results indicate that the growth rate of the unemployment rate and the growth rate of the ratio of the total labor force to the total population are important factors behind the growth rate of the GA caseload. Accordingly, such important factors should be incorporated into the forecasting of future GA caseload. This can be done using the linear regression model estimated above, or through the incorporation of the new variables into a time series regression model. In the time series regression model, we could exclude earlier growth rates of GA, and the error term would be taken care of by the ARIMA data generating process.

Although we have a forecast of the unemployment rate from the Economic and Revenue Forecast Council and a forecast of population from the Office of Financial Management, we need a forecast of the labor force to include in the model. This forecast was performed using the SAS time series forecasting system, where the Winters method was selected. The following Figure 2 illustrates the forecast of the labor force.

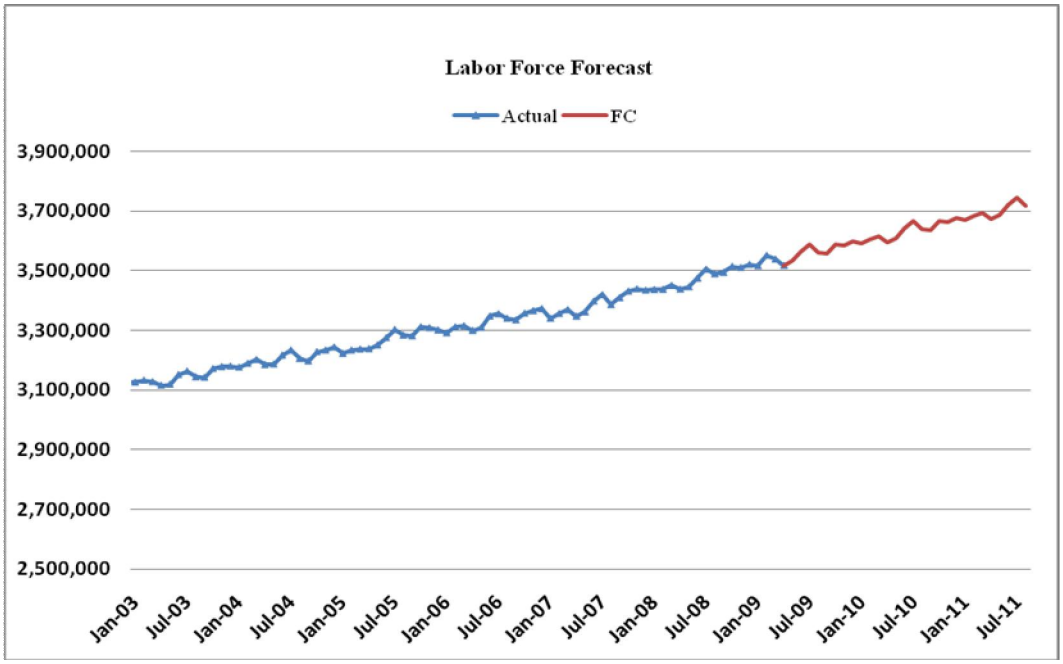


**FIGURE 2** – Forecast of Labor Force

Not surprisingly, both the forecast using the regression model and the forecast using the augmented ARIMA model are very close and are consistent with the 2009 June forecast. This is clearly illustrated by the following Figure 3. The three forecasts exhibit a very similar increasing pattern. The time series regression forecast and the liner regression forecast, however, show a little bit more variability than the June 2009 forecast. This is due to the variability of the unemployment rate and the ratio of the labor force to the total population.

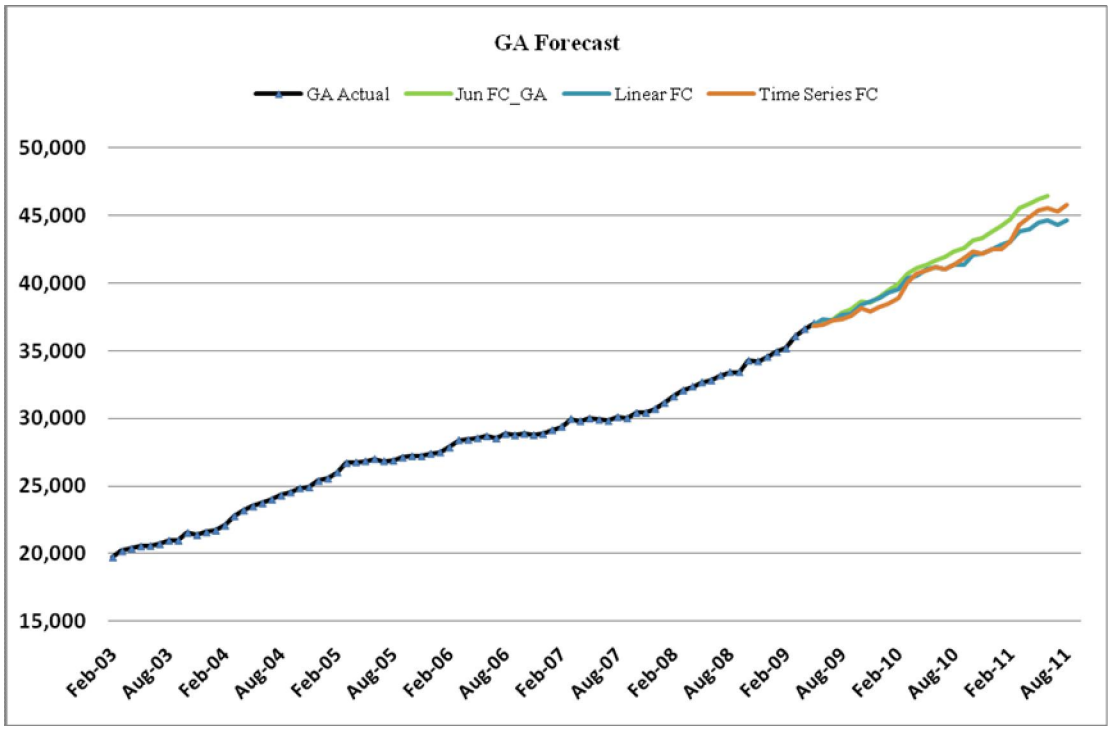


**FIGURE 3** – Forecast of GA

Provided in Table 2-4 below are the forecast tracking and fiscal year caseload changes.

Tracking the Forecast

| | Actual | Jun-09 Forecast | Variance | Percent Variance |
|---|---|---|---|---|
| May-09 | 37,024 | 36,845 | 179 | 0.48% |
| Jun-09 | 37,378 | 37,106 | 272 | 0.73% |

| | Actual | Time Series FC | Variance | Percent Variance |
|---|---|---|---|---|
| May-09 | 37,024 | 36,807 | 217 | 0.59% |
| Jun-09 | 37,378 | 36,919 | 459 | 1.23% |

| | Actual | Linear Regression FC | Variance | Percent Variance |
|---|---|---|---|---|
| May-09 | 37,024 | 36,950 | 74 | 0.20% |
| Jun-09 | 37,378 | 37,333 | 45 | 0.12% |

**TABLE 2** – Forecast Tracking Result

General Assistance-Fiscal Year Caseload Change Based on Time Series Model

| Fiscal Year | Caseload Change | Percent Change | | Caseload |
|---|---|---|---|---|
| 2006-2007 | 1,563 | 5.60% | *Actual* | 29,237 |
| 2007-2008 | 1,944 | 6.60% | | 31,181 |
| 2008-2009 | 3,780 | 12.12% | *Forecast* | 34,961 |

| | | | | |
|---|---|---|---|---|
| 2009-2010 | 3,930 | 11.24% | | 38,891 |
| 2010-2011 | 4,209 | 10.82% | | 43,100 |

**TABLE 3** – GA Fiscal Year Caseload Change Based on Time Series Model

General Assistance-Fiscal Year Caseload Change Based on Linear Regression Model

| Fiscal Year | Caseload Change | Percent Change | | Caseload |
|---|---|---|---|---|
| 2006-2007 | 1,563 | 5.60% | *Actual* | 29,237 |
| 2007-2008 | 1,944 | 6.60% | | 31,181 |
| 2008-2009 | 4,299 | 13.79% | *Forecast* | 35,480 |
| 2009-2010 | 3,746 | 10.56% | | 39,226 |
| 2010-2011 | 3,563 | 9.08% | | 42,789 |

**TABLE 4** – GA Fiscal Year Caseload Change Based on Linear Regression Model

The forecasts using the growth rate of the unemployment rate and labor forecast are "successful" in that they are consistent with the June 2009 forecast. The unemployment rate is currently forecasted to remain high through June 2011. If this forecast changes and the unemployment rate is predicted to fall, then the enhanced forecast incorporating the effect of the unemployment rate may help us predict a future change in the trend of GA growth.

## CONCLUSIONS

Both the theoretical analysis and the empirical testing identify the growth rate of the unemployment rate as one important factor in explaining the growth rate of the GA caseload. This supports the current forecast, which predicts that the GA caseload will continue its strong growth through the forecast horizon, due in part to the presently weak labor market. We also find that the growth rate of the ratio of the total labor force to the total population has a negative impact on the growth rate of the GA caseload. These findings provide critical insight into the future forecasting of the GA caseload trend.

## APPENDIX

*Statement: The growth rate of the GA caseload increases in the growth rate of the unemployment rate and the growth rate of the total population, and decreases in the growth rate of the ratio of the total labor force to the total population.*

Proof.

$$
\begin{aligned}
&Prob(\text{"one is on GA"})\\
&= Prob(\text{"one is on GA"} \cap (\text{"one is not working"} \cup \text{"one is working"}))\\
&= Prob(\text{"one is on GA" and "one is not working"})\\
&\quad + Prob(\text{"one is on GA" and "one is working"})\\
&= Prob(\text{"one is on GA" and "one is not working"})\\
&= Prob(\text{one is on GA conditional on one is not working})\\
&\quad * Prob(\text{one is not working}).
\end{aligned}
$$

*A full set of references and a complete Appendix is available upon request from Xingguo Zhang at xingguo.zhang@cfc.wa.gov*