

Unemployment Trends in the United States  
Stat 626: Time Series Analysis  
Introductory Report

Group 4

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## US Unemployment Trends - Group 4

Unemployment has been a topic of concern throughout the United States in recent years. Graduate and Undergraduate college students alike are concerned over their employment prospects, wondering if their degrees will be enough to gain them a job after graduation. In these times of economic uncertainty, obtaining an income generating position is not the guarantee it has seemed to be in generations past. Therefore, the purpose of our project is to examine trends in unemployment in the United States, focusing on the years from 1992 to 2015, with a goal of forecasting into late 2016 and beyond. Initially, we plan on using manufacturing data, house prices, retail sales, and construction data to make our predictions. As we explore the relevant economic literature, we may consider incorporating other explanatory variables as well.

Initially, our group examined the unemployment trend as an individual entity. The measurements were taken monthly throughout the time span being studied. This time span includes the presidential terms of Bill Clinton, George W. Bush, and Barack Obama, each serving eight years in office. Initial graphs of the data seem to indicate that, in general, unemployment spiked at the beginning of each president's term and fell gradually over the time he was in office. There are two noticeable spikes that represent that recessions of 2001 and 2008, respectively, with the latter being the most significant as Obama took office in January 2009. The 2008 recession also follows the burst of a housing market bubble, therefore we have chosen to include related variable such as housing prices and construction spending.

Plotting unemployment with relevant predictor variables, it is evident that house prices have risen sharply through the years. Also, while retail sales, construction spending, and manufacturing spending have increased, there appears to be seasonal trends, perhaps representing the holiday months. As we begin building our model, we plan to account for recessions and political shifts as well.

Diagnostic plots show that current unemployment appears to be most influenced by the previous month's measurement, and a scatterplot matrix shows that unemployment has little to no discernable relationship with the predictors. Transformations may be used to account for this to fit an optimal model.

In sharing the workload for this project, our group has chosen to use the project management site GitHub. We have also used collaborative writing tools, such as Overleaf. Final responsibility for each of components is shared, with that in mind our initial division of labor follows. Sean, as the only member in an on-campus section, is in charge of presentations. Joseph is handling data prep, code management, and initial plots. Akarshan is heading up the model fitting and selection. Bo the model fitting and plots. Travis is in charge of diagnostics. Alison is organizing the writing. However, these divisions are not set in stone and we are all planning on supporting the other members throughout the process.