Project 3 Proposal Analyzing Unemployment

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1. Introduction/Background

We are currently experiencing the second major economic recession of our lifetimes due to the COVID-19 pandemic. In the age of information, the advancement of machine learning algorithms has allowed us to gain more knowledge from global economic data than ever before [1]. Integrating data analysis with financial data has made tremendous strides in trading, fraud detection, and market forecasting [2]. These same techniques can be applied on large scale macroeconomic data for countries to find patterns between economic policy and statistics, and unemployment [3].

The unemployment rate is a common metric used to describe a recession; however, a recession affects many more aspects of a country's economy. Our proposal is to use publicly available datasets to collect yearly attributes such as deficit, tax rates, interest rates, minimum wage, etc. and see if there is any clear correlation with the unemployment rate. Our main goal is to identify which factors or policies contribute to an increase in unemployment for countries.

2. Methods and Checkpoint

Our current plan is to use multiple linear regression to determine the most influential factors overall for the countries. We are also going to try and use advanced methods that we will be learning in this course such as Neural Networks.

Out data inputs will be complex since we will have multiple years' worth of economic data for multiple countries. Because of this, we will focus on data preprocessing as well by using methods such as Principal Component Analysis to simplify our data.

3. Potential Results

This project focuses primarily on data analysis, so the most direct result will be pure information. This information may identify unique and interesting correlations, which could be used to make predictions [3] and can be organized into visualizations for people to make sense from it. From there, optimal policy could be recommended for purposes of economic relief.

One hypothesis we are looking into is that of Keynesian economics, which asserts that increasing government spending along with lower taxes will stimulate the economy during a recession to decrease unemployment. This is something that was proposed in the 1930s during the great depression [4]. This theory is still controversial, so comparing and contrasting the effects of Keynesian economic policies on a global scale would be a useful report to economists.

4. Discussion

The best outcome of this project would be new light shed on the relationships between economic policy and statistics related to the economic state of a country. That information could be used to develop new policies to improve the economy and shorten current and future recessions.

Especially since there is a lot of economic data available for the 2007 recession and the 2020 recession, finding global patterns would create some sort of stability within the global atmosphere. Regardless, our goal is to be as objective as possible and use the shared data and results to discuss how policy changes affect the economy.

5. References

1. Athey, S. (2018). The impact of machine learning on economics. In The economics of artificial intelligence: An agenda (pp. 507-547). University of Chicago Press.
2. Puglia, M., & Tucker, A. (2020). Machine Learning, the Treasury Yield Curve and Recession Forecasting.
3. Katris, C. (2020). Prediction of unemployment rates with time series and machine learning techniques. Computational Economics, 55(2), 673-706.
4. Jahan, S., Mahmud, A. S., & Papageorgiou, C. (2014). What is Keynesian economics?. International Monetary Fund, 51(3).

6. Video Link

https://bluejeans.com/s/1sW2A/