

# Team 042 Project Proposal

## CSE6242 – Spring 2021

Project Title: The Economic Impact Caused by COVID-19 on People's Life

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## 1. Introduction (H1, H2)

**(H1)** The outbreak of COVID-19 and the lockdown has dramatically affected economic activities and brought about disparate consequences across counties, cities and communities. The goal of this project is to demonstrate how hard the pandemic hurts people's well-being, in terms of the loss of lives and job opportunities, so we can explore the relationship between covid-19 and the economy in the US, and help people be better-prepared for the challenges and opportunities emerged in the aftermath of the pandemic.

**(H2)** Most current research works are focused on separate factors, such as the transmission condition of COVID 19 or the change of house market in different areas. However, there is no research to evaluate the overall impact by considering the impact of the pandemic as well the economic environment together. For this proposal, all team members have contributed a similar amount of effort.

## 2. Literature review (H2)

After the outbreak of COVID-19, researchers have done tons of exploration on how to measure COVID-19 infection rate and human transmission [1]. A basic measurement  $R_0$  is defined to evaluate the average number of new infections created by an infectious individual in an entirely susceptible population [2]. Therefore, in this project, we will use  $R_0$  value to assess the infection rate of COVID-19 in the US.

The economic consequence of the pandemic on people's life has been evaluated in several research. **House market, household spending, household income and unemployment rates** are used to evaluate the impact of COVID-19 in this project. 1). In research for house market, in [4], study demonstrates that the COVID-19 pandemic has disparately impacted low-resource areas and racial and ethnic minorities are experiencing the worst outcomes of this pandemic. In [3] [5], researcher uses a panel regression model and non-parametric model to evaluate the 'Fear of Missing Out' house purchase and Other COVID-induced fundamental changes in household behavior, and a two-step VAR model is used to forecast the effect of the COVID-19 outbreak in New York. The paper [6] shows that renters are facing difficulty to pay the rent since COVID-19, and even many households are still facing difficulties to pay their mortgage, especially if they have lost jobs or seen their incomes drop dramatically. Another paper [7] illustrates that the demand for homes close to city centers and neighborhoods with large populations decreased. 2). CPI (Consumer Price Index) is one of the indicators showing the impact on household spending. In[8], researches show that the traditional CPI calculation methodology provided by BLS (Bureau of Labor Statistics) may not be appropriately applicable to 2020 due to COVID-19, because the spending patterns could be changed during the pandemic, like from 'Recreation, Travel, and Entertainments' to 'Food and Beverages'. Researches proposed alternative methodologies in [9][10][11], which shows the implied CPI is higher than officially reported from BLS. 3). Household income and unemployment rates are usually considered together. In [14][15], research highlights various government policies that offset income losses from unemployment. According to [12], unemployment rates increases in worldwide is associated with obvious increases in suicide both in high and low scenario. In [13], research shows that young workers, women,

workers with low educational attainment, part-time workers, and racial and ethnic minorities have experienced the largest increases in unemployment rates in pandemic time, and the unemployment rate of each state in April is also greater than their highest unemployment rates during the Great Recession.

### 3. Problem Statement (H3~H7)

**(H3)** We are trying to evaluate how the change of housing price, the spread of COVID-19, the change of the job market, and the inflation rate affect people's economic well-being during the pandemic around different regions in the US. We will explore reasonable approaches to analyze the impact of several changes on people's economic well-being. Since the pandemic, the change of the job market, and the economic policies implemented by the government are interrelated, it is feasible for us to investigate the links between these factors with the help of data gathered from various sources. More details can be found in the Section 4, Data collection.

**(H4)** The findings from this project would help people find out how hard the pandemic hurts people's well-being, physically and economically. So, they can be well-informed of their current situation and be prepared for the challenges and opportunities emerge in the coming year.

**(H5)** The study conducted in this project would enable users to capture the interaction of several economic/financial variables and to utilize it to forecast the aggregated impact. and improve the preparedness to the aftermath of the pandemic. It would also shed a light on the current recovery and help people be better prepared for the challenges and opportunities emerged in the aftermath of the pandemic.

**(H6, H7)** Currently we are taking the risks that we lack theoretical support for the method to evaluate the general impact of pandemic, inflation, fluctuation in the job market and volatility of the market. However, even the gross evaluation is still worthwhile and would provide valuable results. The project would take approximately two months until the project due date of this course, so the primary cost is the time. In addition, we may pay service charges to obtain specific data sources or Cloud service, but this is to be determined.

### 4. Data Source (H3)

Since the outbreak of COVID-19 CDC has been monitoring daily data across the US. The COVID-19 data (~2.4GB) can also be found and accessed using an [API](#) given by CDC. With respect to the economy data such as house market (~2MB), CPI (61KB), unemployment (2KB), and household income (21KB), we will collect them from different sources including but not limited to [Economic News Releases of Labor Statistics](#), Center on Budget and Policy Priorities ([CBPP](#)), [BLS](#), and [DQYDJ](#).

### 5. Evaluation and Final Results (H8, H9)

**(H8)** The whole project should be completed in 8-10 weeks, until the due date of the course.

**(H9) BI-weekly Review** will be applied to check the progress of the project and resolve the technical issues. **At Midterm check**, data evaluation and preliminary modeling work evaluation should be completed. **At Final evaluation**, the final report and visualization dashboard should be completed. An anticipated result for this project is to build a dashboard or map that illustrates the relationship between economy and covid-19, with a front-end interface that allows users to do interaction with our dataset.

# References

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