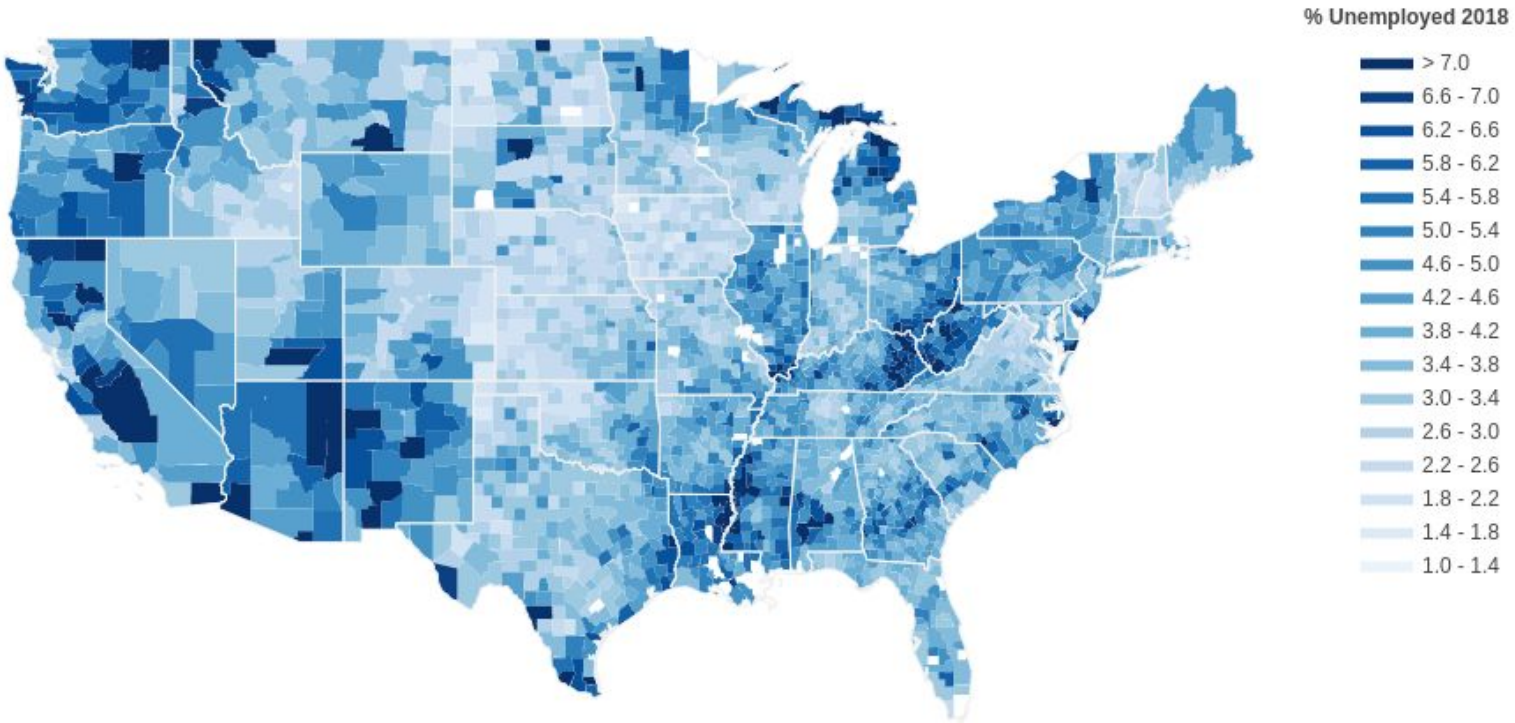
Unemployment Rate Research Project



Overview

The Unemployment Rate is one of the most pivotal economic statistics to look at when judging the health of an economy. The rate is calculated by the U.S. Census Bureau, which utilizes the monthly Current Population Survey (CPS) results (as well as some other public data) to extrapolate national unemployment rate figures. Far from being a clear-cut calculation, the rate is backed up by several key assumptions and estimates. It is important to dig into these assumptions and estimates to understand the logic behind the calculation, for it is always in the best interest of the governing bodies to paint a rosier picture of the economy than exists in reality.

There are several goals I have with this research:

(1) Lay out the formula for current calculation of unemployment rates put forth by the Census Bureau

(2) Create my own unemployment rate based on assumptions I find more valid, and compare these rates with the “official” rates for each month of the 21st century

(3) Find and analyze specific sub-population groups (e.g. Black Males 20-25) who exhibit extraordinary rates or trends in unemployment over a period of time

(4) Look specifically at recession/depression periods during the 21st century (i.e Dot-Com bubble, Great Recession and Current Coronavirus Economic Downturn for which an official name does not yet exist), analyze and comment on important rates and trends (how do small business fare? Which sub-populations are most affected?)

(5) Compare unemployment rates as well as calculation methodologies between U.S. and other similar countries (e.g. Germany, Canada, France, Australia, etc..)

(6) Look at other economic, health and environmental data in conjunction with unemployment rates

Vision For The Future:

If properly designed, I believe a website which displays this information in a graphical format and is built in a way to encourage user input and engagement could be a great learning tool as well as an important source for researchers and policy makers. Instead of merely spitting back the official rates, such a source would encourage users to think about who they might include within those counted as unemployed. For example, should non-violent drug offenders currently in prison be considered unemployed? By engaging the user to think and decide for themselves, they will be forced to consider just how subjective these calculations can be, and how a single number should not be taken at face value without further considerations.

Data Sources

Data Source	URL	Notes
Current Population Survey (CPS)	https://www2.census.gov/programs-surveys/cps/datasets/	• Years: 1995-2020 • Monthly Files • cps_downloader.py script downloads data into specified folder
Population Estimates & Forecasts	*1990-1999:* https://www2.census.gov/programs-surveys/popest/tables/1990-2000/historical/est90/ *2000-2009:* https://www2.census.gov/programs-surveys/popest/datasets/2000-2009/state/asrh/sc-est2009-alldata6-all.csv *2010-2018:* https://www2.census.gov/programs-surveys/popest/datasets/2010-2018/state/asrh/sc-est2018-alldata6.csv *Forecasts:* https://www2.census.gov/programs-surveys/popproj/datasets/2017/2017-popproj/np2017_d1.csv	• Years: 1990-2018 • Script to clean and process: pop_est_all.py
Living Wage Estimates	*Previous Years:* https://web.archive.org/web/*/https://livingwage.mit.edu/ *Current Year:* https://livingwage.mit.edu/	• Years: 2016-2020 • Metro and state level wage figures broken out by household size • Scraping script: livingwage.py

U.S. Census Unemployment Rates: U3 and U6

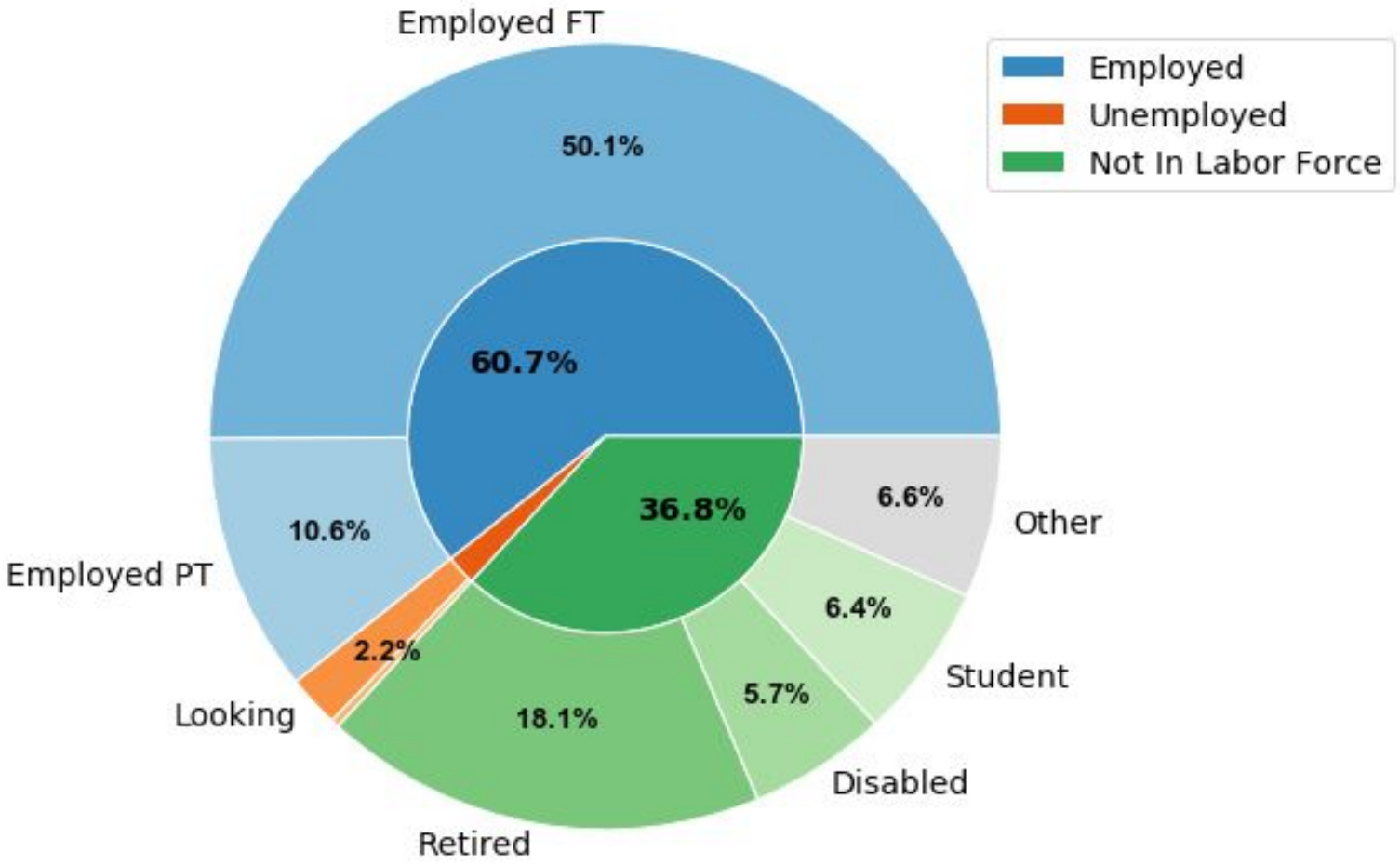
Relevant Population: Adult (16+) Civilian Non-Institutionalized Population (Excludes active military and all those institutionalized/incarcerated)

U3 Rate: "Official" Unemployment Rate reported on in the news
U6 Rate: Alternative rate which considers a larger portion of the population as unemployed compared with the U3 Rate

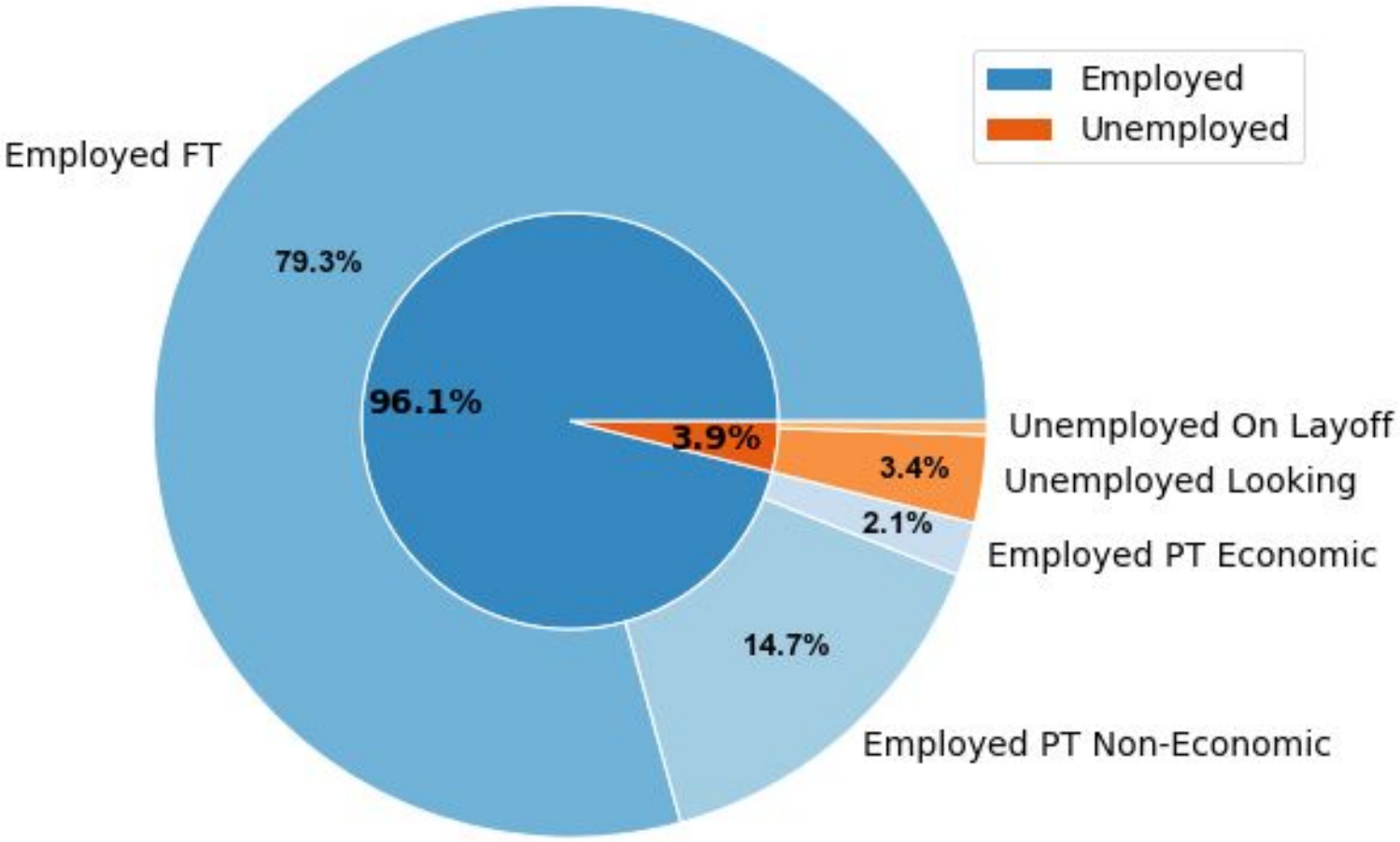
Labor Force: **Employed + Unemployed**
Unemployment Rate: **Unemployed / Labor Force**
Labor Force Participation Rate: **Labor Force / Total Population**

Population Segments	*U3 Rate*	*U6 Rate*
Employed	1. **Individuals at work** 2. **Individuals temporarily absent from work** ○ *Full Time:* 35+ Hrs/Week ○ *Part Time:* >35 Hrs/Week	1. **Individuals at work** 2. **Individuals temporarily absent from work** ○ *Full Time:* 35+ Hrs/Week ○ *Part Time:* >35 Hrs/Week
Unemployed	1. **Individuals not working who have been searching for work within the past *month*** 2. **Individuals on layoff from work**	1. **Individuals not working who have been searching for work within the past *year*** 2. **Individuals on layoff from work** 3. **Discouraged individuals** 4. **Part-time workers who aren't working full-time for economic reasons (slack work, material shortages, repairs to plant or equipment, start or termination of job during the week, and inability to find full-time work)**
Not In Labor Force (NILF)	1. **Retired individuals** 2. **Discouraged individuals** 3. **Disabled individuals** 4. **Individuals looking for work, but not within the previous *month***	1. **Retired individuals** 2. **Disabled individuals** 3. **Individuals looking for work, but not within the previous *year***

2018 Adult Non-Institutionalized Civilian Population Segments (16+)



2018 Labor Force Segments



***FT = Full-time, PT = Part-time**

Calculation Details

1. Weighting

Each month, the U.S. Census Bureau collects survey responses from around 100,000 individuals scattered around the U.S. The collection of individuals represented in these surveys will not be perfectly representative of the entire Adult Civilian Non-Institutionalized U.S. population. Therefore, weights must be applied to survey responses in order to ensure that responses are as accurately reflective of the underlying population as possible. Population estimates data (available on a yearly basis) are used for this task. Survey responses are weighted according to population percentages corresponding to the following features:

a. Age
b. Race
c. Origin (Hispanic/Not Hispanic)
d. Sex
e. State

Example:
Features: Black non-hispanic males between 20-29 in New York State
Survey results: .4%
Population: .49%

Each response from an individual falling into these five categories is assigned a weight of .49/.40 = 1.225. In other words, their responses are more heavily weighted when calculating rates because they are under-represented in the survey.

2. Seasonal Adjustment

Seasonal adjustments are made to the unemployment rates to account for typical fluctuations in the yearly business cycle. A specific type of Time Series Moving Average formula is used to calculate these seasonally adjusted rates. Both seasonally adjusted and non-seasonally adjusted rates are released by the Census Bureau, however the seasonally adjusted rates are the ones commonly reported on.

Self-Calculated Rates

Deciding upon the groups of people who should or should not be included in the labor force is a normative exercise. There is no single objective way to do it. This is especially true when the available data is limited, and inferences and estimations are needed to make certain calculations possible. However, I believe certain methods are better than others, and consider the U6 rates to be far more appropriate than the U3 rates. My goal here is to lay out my philosophy behind the question of how to best measure the health of an economy from an employment perspective, and then to detail the calculations I have done to arrive at my own unemployment rates derived from the Current Population Survey data.

Would you consider slaves to be employed? They certainly have a job to do. It's quite obvious to people nowadays that slaves should not be considered employed. What are the qualities of slavery which determine this? Well first of all, they don't have a choice in the matter. Secondly, they do not make a wage, and are merely provided the minimum of what is necessary to survive so that they can continue working and generating value for their owners. Thankfully, we have moved past an economic system based upon this type of brutal subjugation. However, to this day many individuals are unable to earn enough money to afford to provide for their most basic needs. In large metropolitan areas across the country, full time workers are sleeping on the streets or in their cars as they are unable to afford a roof over their heads. Would you consider these individuals employed? They have a job which pays them money, but not enough to afford basic necessities. I argue that an individual should only be considered fully employed if they earn at least enough money to provide for their basic needs.

How would you go about quantifying this? Well thankfully, MIT calculates and displays what they call "Living Wage Estimates" for all counties, metropolitan areas and states in the country. Estimates are provided for different types of families (e.g. single person, married couple with 1 working adult and 1 child, etc..). I matched this data up with survey responses, and calculated the proportion of a living wage that each employed survey respondent was making. For example, if the living wage in New York City for a single person was $20/hr and a single survey respondent living in NYC reported to be making $15/hr, under my methodology they would be considered only ¾ employed or ¼ unemployed.

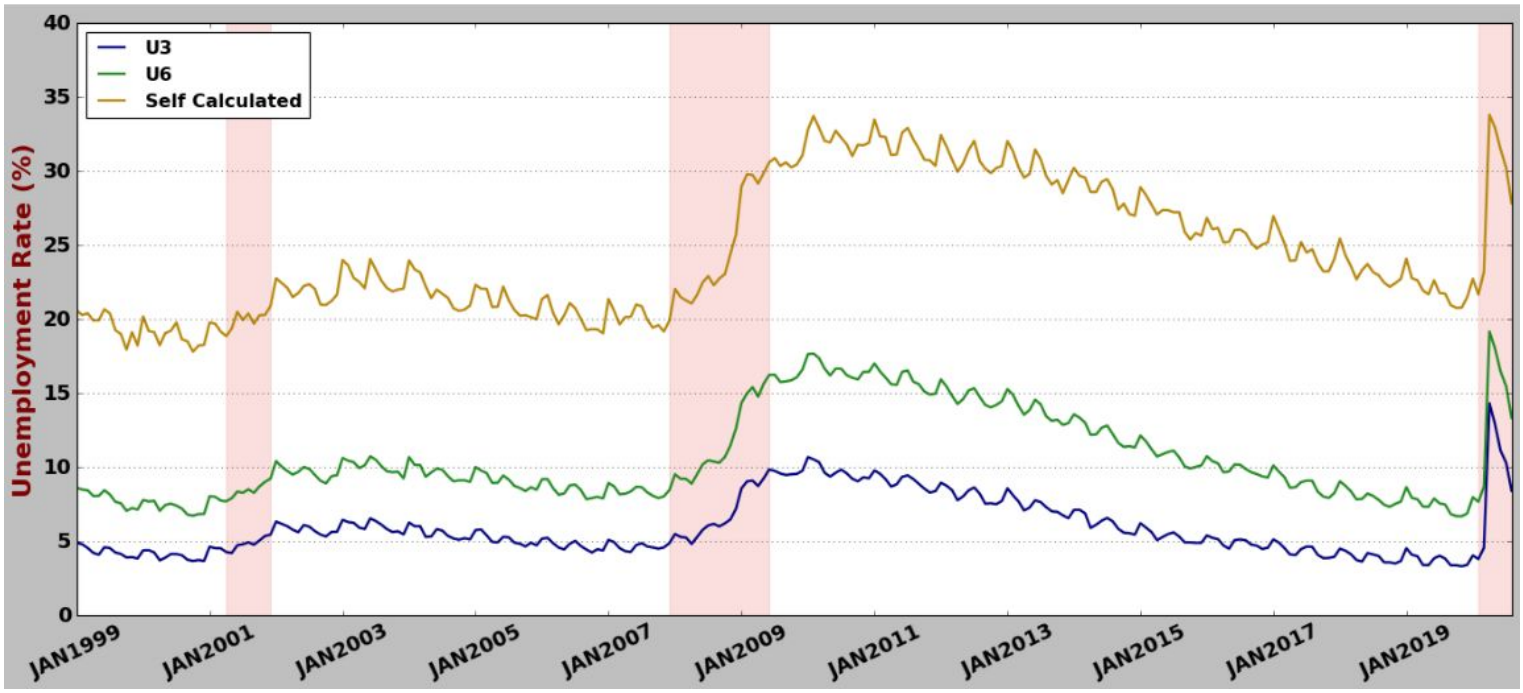
A similar method was used to quantify part-time unemployment. Whereas the U6 methodology considers those working part-time for non-economic reasons as fully unemployed, I divided respondents' part-time weekly hours over the full-time hourly threshold (35 hours/week). Therefore, someone working 17.5 hours per week who wanted full time work but worked part-time (for a specific set of reasons) would be considered only ½ employed.

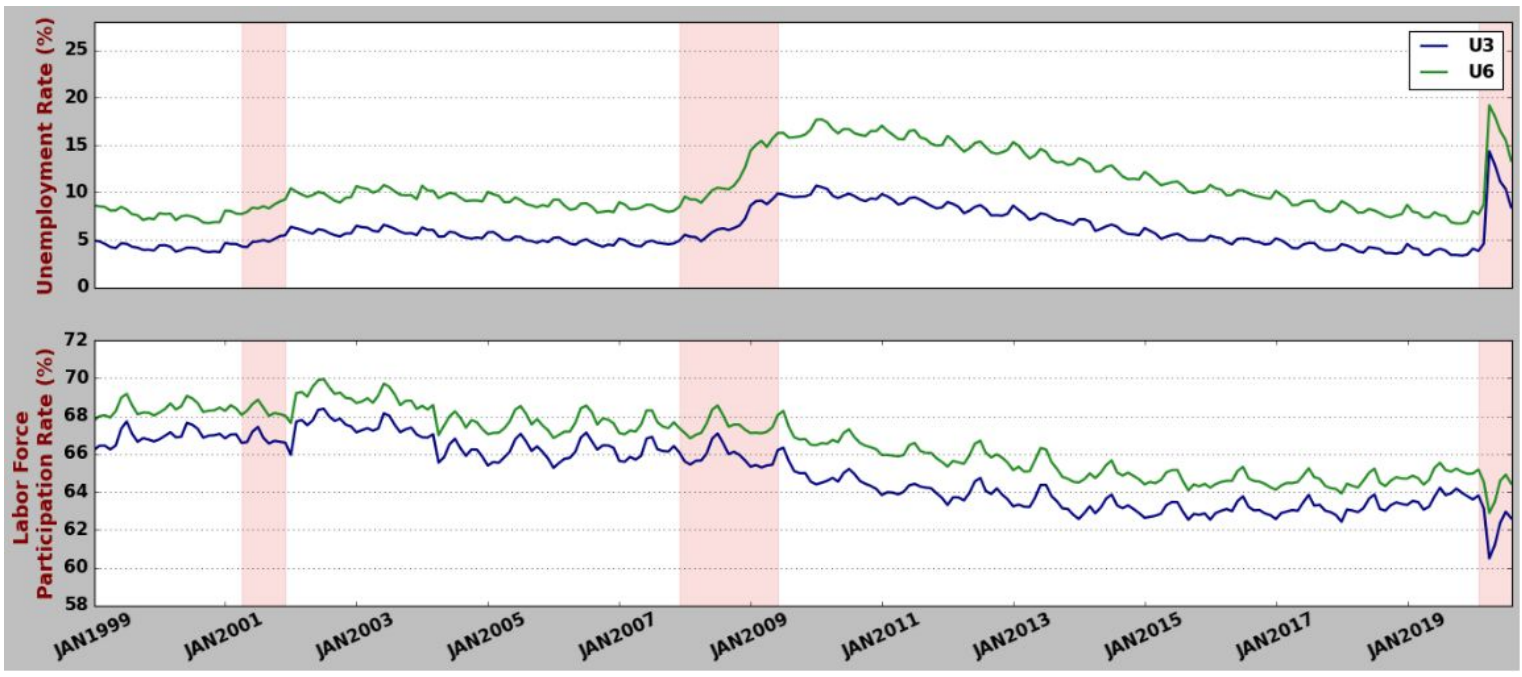
In addition to wage and part-time unemployment, I included within the fully unemployed population those who were discouraged job seekers, and others who were not looking anymore for various reasons, including perceived discriminatory hiring decisions, child care issues and a lack of necessary education.

Lastly, I included all those who were not working because they were disabled due to a workplace injury. This figure was estimated by a report I found which concluded that just under 30% of those disabled in the U.S. become disabled in such a manner. That concludes the list of different population groups which I have determined to be counted within the unemployment population. I would have liked to also add in non-violent drug offender serving time, but due to data availability issues I have been unable to do so as of yet.

Whereas we seem to see problems such as unemployment as an individual personal failing in our society, the main philosophy behind my assumptions and assertions is that unemployment is in fact a social problem addressable only through well-thought-out policies. We could, for example, make sure that nobody is earning below the living wage in the city or county that they live in. Or we could mandate stricter workplace safety measures to ensure that fewer people get hurt on the job. When capable and eager men and women are unable to earn a proper living, it is not only their self esteem that suffers, but it also ensures that more of the public's tax money is used to help with support. (So in essence, it is a transfer of wealth from the public purse to certain corporations, achieved by skimping on pay, benefits, safety precautions and job security.)

Unemployment Rate Stat Visuals





Self-Calculated Unemployment Rate Components

Unemployment Types	*U3 Population Group*	*Methodology*
Wage	**Employed**	**Using annualized growth rates of living wage estimates between 2016-2020, calculate estimate values for 1999-2015**
Part-time	**Employed**	**Included in calculation are any part-time workers who are not full-time workers for the following reasons:** **- Slack Work/Business Conditions** **-Could Only Find Part-time Work** **-Seasonal Work** **-Child Care Problems** **-Health/Medical Limitations** **-Full-Time Workweek Is Less Than 35 Hrs** **-Retired/Social Security Limit On Earnings**
Discouraged	**Not In Labor Force (NILF)**	**Included are those who have given up looking for work because they could not find any work or believe there is no work available within their area of expertise**
Disabled	**Not In Labor Force (NILF)**	**28.6% of all disabled individuals (who are not discouraged or counted as unemployed under U3 methodology) as per research article: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2586787/**
Unemployed	**Unemployed**	**Same as U3 unemployed population**

Population Visual