

# The Measurement of Macro-economic Activity

Business cycles and the unemployment rate

**Miles Corak**

Department of Economics, and Stone Center on Socio-Economic Inequality  
The Graduate Center, City University of New York

[MilesCorak.com](http://MilesCorak.com) @MilesCorak

**Block 3**

Economics for Everyone

Lecture 9

# Motivation

# Objectives for this block of classes

1. The measurement of macro-economic indicators
  - Gross Domestic Product
  - Unemployment, Inflation
2. A model of macro-economic activity
  - The Keynesian short run model
  - The “classical” model
3. Macro-economic public policy
  - fiscal policy
  - monetary policy

# GDP and unemployment

# The Business Cycle

GDP often dips below and recovers from its full potential

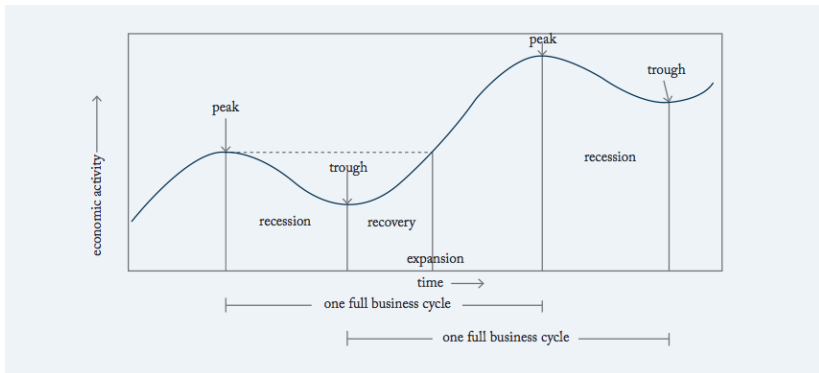


Figure 1: The anatomy of business cycles

# The Business Cycle and the unemployment rate

Look for trends and cycles in the unemployment rate

- theoretical concepts not in the statistics
  - frictional unemployment
  - structural unemployment
  - involuntary unemployment

You should get to know FRED if you want ready access to all sorts of US economic data

- <https://fred.stlouisfed.org/>

# The Business Cycle and the unemployment rate

“Okun’s law” links changes in GDP and the unemployment rate

## Statistical estimates

The answer I have to offer is simple and direct. In the postwar period, on the average, each extra percentage point in the unemployment rate above four percent has been associated with about a three percent decrement in real GNP.

put forward by Arthur Okun of the Brookings Institution in 1962

- not really a law, more like a rule of thumb
- relates the percentage gap in GDP from its potential to the change in the unemployment rate
- the Okun’s law coefficient is generally taken to be somewhere between 2 and 3

Read [the post on my website](#) for some background on Okun’s law and its use

# Statistical backdrop



# The Current Population Survey

conducted by the Bureau of Labor Statistics

- a monthly survey of about 60,000 American households
- asked questions about labor market activity during a particular week of the month
- results reported on the first Friday of the next month
- March 2020 results were reported on April 3<sup>rd</sup>
  - showed the largest one month increase in the unemployment rate since 1975
  - the unemployment jumped by 0.9 percentage points to 4.4%
- what do these numbers mean? do they fully capture the under-utilization of human potential

# Statistical backdrop

## The difference between a survey and a census

### 1. Census

- collects information from all “units” in the population
- can be time consuming and costly
- no sampling error

### 2. Sample Survey

- collects information from a fraction of “units” in the population
- can be faster and less costly
- subject to sampling error

# Statistical backdrop

## The relationship between a census and a survey

1. A census is used to create a “sampling frame” or to obtain benchmark information
2. The survey frame
  - target population is the population for which the information is required
  - survey population is the population actually covered by the survey
    - ideally this would be the same as the target population
    - the results of the survey apply to this population only
3. The target and survey populations may differ
  - cost of data collection in isolated places
4. The survey (or sampling) frame is the means of accessing the units of the population, it identifies the survey population

# Statistical backdrop

survey “errors”

1. Sampling errors
2. Non-sampling errors

# Statistical backdrop

## survey “errors”

### 1. Sampling errors

- the error that results from estimating a parameter by measuring a proportion of the population rather than the entire population
- we need to know the extent of the sampling error, which is measured by the sampling “variance”
- for probability samples there are methods to calculate this, and why we study statistical theory
- factors affecting the sampling variance include:
  - variability of the characteristic of interest
  - size of the sample
  - response rate
  - sample design

# Statistical backdrop

## survey “errors”

1. Sampling errors
2. Non-sampling errors
  - the error not related to the processing of the population
  - these are errors that are “systematic” and can arise during the course of the survey apart from the sampling
    - “random” errors cancel out if the sample is large enough
    - “systematic” errors go in the same direction, and accumulate
  - lead to biased statistics
  - not corrected by increases in the sample size, and represent a major concern
  - coverage errors, measurement errors, non response errors, processing errors

# Measuring unemployment

# The Current Population Survey

conducted by the Bureau of Labor Statistics

Target and survey populations

1. The BLS is trying to estimate the unemployment rate (among other things)
  - a measure of the underutilization of human resources in the American population
  - more specifically in the “civilian noninstitutionalized population” which excludes
    - active duty members of Armed Forces
    - those living in institutions, prisons, jails, and other detention centers, and those living in residential care facilities
2. Concepts and definitions can be found here:
  - <https://www.bls.gov/cps/definitions.htm>



# The Current Population Survey

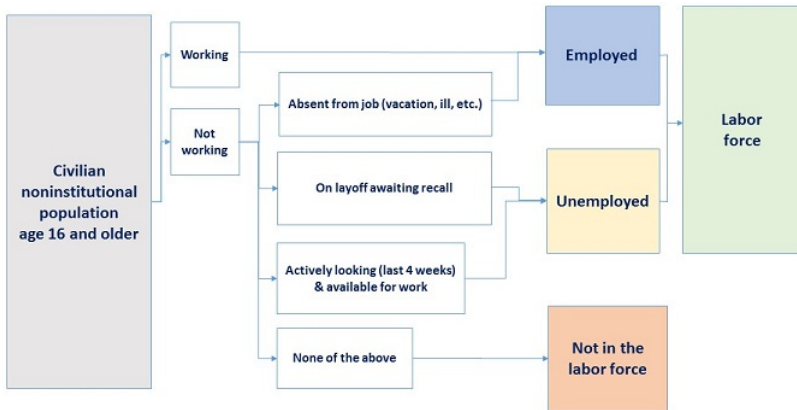
conducted by the Bureau of Labor Statistics

The survey is a monthly survey, and usually conducted during the week following the “reference” week, the week containing the 12<sup>th</sup> day of the month.

- Current Population Survey concepts are measured according to respondent activity during the reference week

The determination of labor force status involves placing each individual in the survey into one of three categories:

1. employed
2. unemployed
3. not in the labor force



Source: <https://www.bls.gov/cps/definitions.htm>

# The Current Population Survey

## Labor Force Concepts

### 1. **Employed (E)**

- worked at least one hour as a paid employee or in own business, profession, trade, or farm
- temporarily absent from their job, business, or farm
- worked without pay for a minimum of 15 hours in a business or farm owned by a family member

### 2. **Unemployed (U)**

- not employed during the survey reference week and available for work during the survey reference week
- made an active effort to find a job during the four-week period ending with the survey reference week, or temporarily laid off and expecting to be recalled to their job

### 3. **Not in the Labor Force (NILF)**

- neither employed or unemployed
- that is, unwilling or unable to offer or supply labour services under conditions existing in their labour markets during the reference week

# The Current Population Survey

## Estimates from March 2020

	March 2020	thousands	per cent	standard error
Population (POP)		259,758		
Labor Force (LF=E+U)		162,913		246
Employed (E)		155,772		265
Unemployed (U)		7,140		172
Not in the labor force (NILF)		96,845		

Source: [Bureau of Labor Statistics, News Release, April 3, 2020, Summary Table A](#). Seasonally adjusted data.

Standard error is for the month to month change.

# The Current Population Survey

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Participation rate (LF/POP)			62.7	
Employment rate (E/POP)			60.0	
Unemployment rate (U/LF)			4.4	0.12

Source: [Bureau of Labor Statistics, News Release, April 3, 2020, Summary Table A](#). Seasonally adjusted data.

Standard error is for the month to month change.

# Unemployment and labor market slack

Is the unemployment rate a full measure of the under-utilization of human resources?

1. Just how does the survey define job search activities?
2. Just how many hours of work are required to be considered employed?
3. How long are people unemployed?

The BLS actually publishes six “**alternative measures of labor underutilization**” and a host of detailed information on reasons for unemployment, duration of unemployment, hours of work, wages.

- U3 is the official unemployment rate, currently at 4.4%
- U6 is the broadest measure, currently at 8.17

# Making a prediction

## Using Okun's law to “guess” the unemployment rate in April

- what will the next release of the CPS on Friday, May 8<sup>th</sup> tell us?
  - the reference week is April 8<sup>th</sup> to 14<sup>th</sup>, capturing the economic consequences of the lockdown in a way that last month's release just hinted at
- how much did GDP fall?
  - some say by 10%, so if Okun's law is 2, this would imply a 5 percentage point increase in the unemployment rate, from 4.4% to 9.4%
  - obviously different estimates for different forecasts of GDP or feelings about Okun's law
- what other statistics should we be watching to get a full picture?

Next class



## Class on May 5<sup>th</sup> continues Block III

1. Next two lecture introduce and use the Keynesian model
  - what determines GDP and changes in GDP
  - what is the role for government policy
2. Class assignment
  - book review due on May 12<sup>th</sup>
3. Thank you for engaging in the one-on-one conversations
  - these are still available if you would like to speak with me
  - would you like to have a collective meeting via Zoom?