Wisconsin Unemployment Rate Forecast

- Recall, the Nov 2013 Wisconsin Unemployment Rate was 6.3%

- Tuesday, I forecasted the Dec 2013 rate
  - Point Forecast 6.2%
  - 50% Interval: (6.2%, 6.3%)
  - 80% Interval: (6.1%, 6.3%)

Data from Wisconsin DWD

- Google "Wisconsin Department of Workforce Development"
- Facts & Data/Unemployment Rates/State

Data from BLS

- Google "BLS"
- Can look under "Economic Releases"
- Data Tools/One Screen/Unemployment/

Local Area Unemployment Statistics (LAUS)/

Top Picks/Wisconsin/seasonally adjusted

Graphs

- With time series data, graphs are very useful.
- The place to start is a time-series plot.
  - A plot of the values of the series against time.
- Let's demonstrate by plotting U.S. GDP

Plotting GDP

- Go to www.bea.gov
- GDP/Current-dollar and real GDP (excel)
- Change format to numeric
- Copy entries for annual data
- Open STATA
- Data/Data Editor/Data Editor (Edit)
- Paste Entries into Data Editor, and close
- Rename
  - rename var1 time
  - rename var2 gdp
  - rename var3 rgdp
- Declare the time variable
  - tsset time
- Plot series
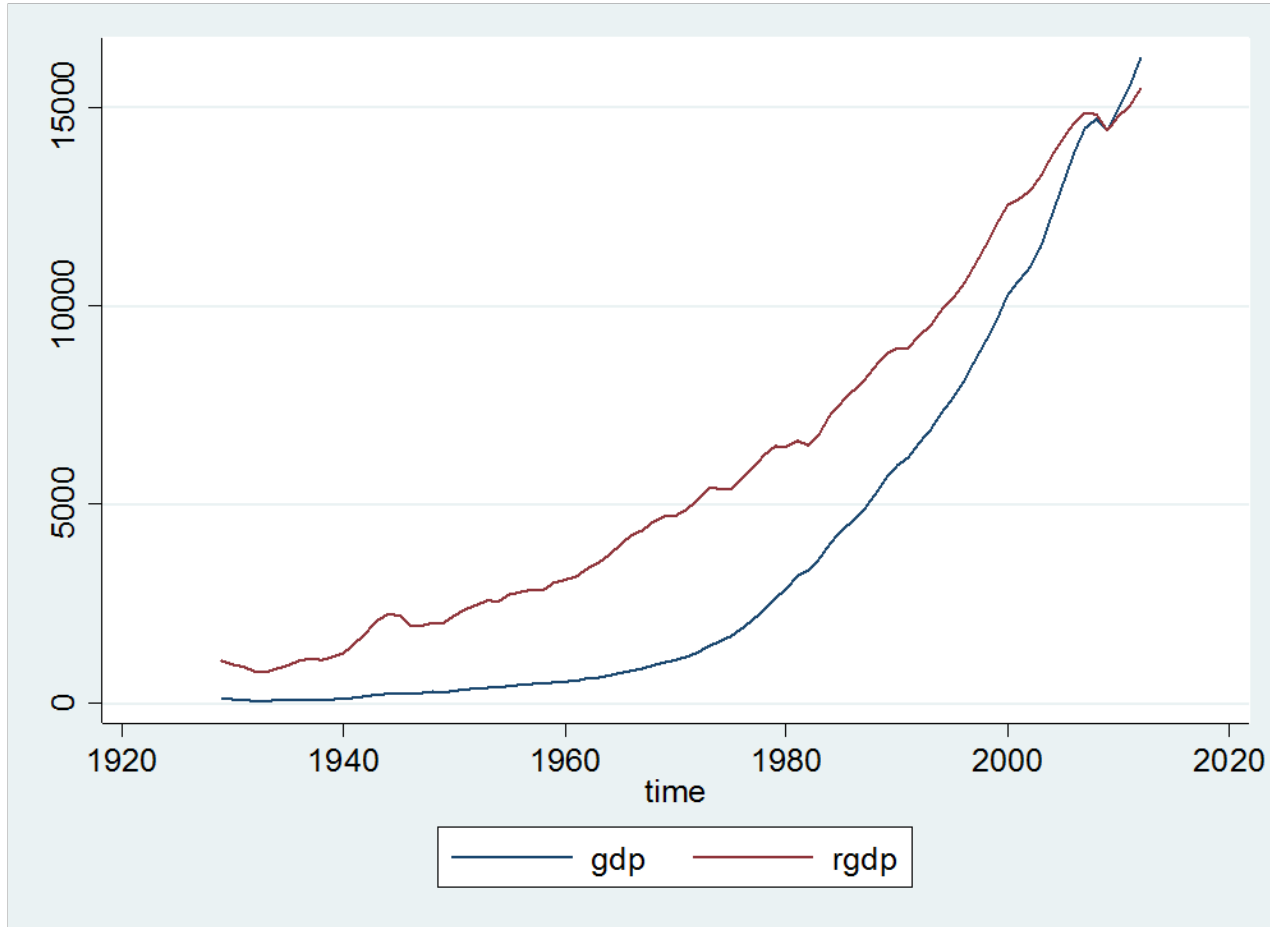 - tsline gdp
  - tsline rgdp

U.S. GDP
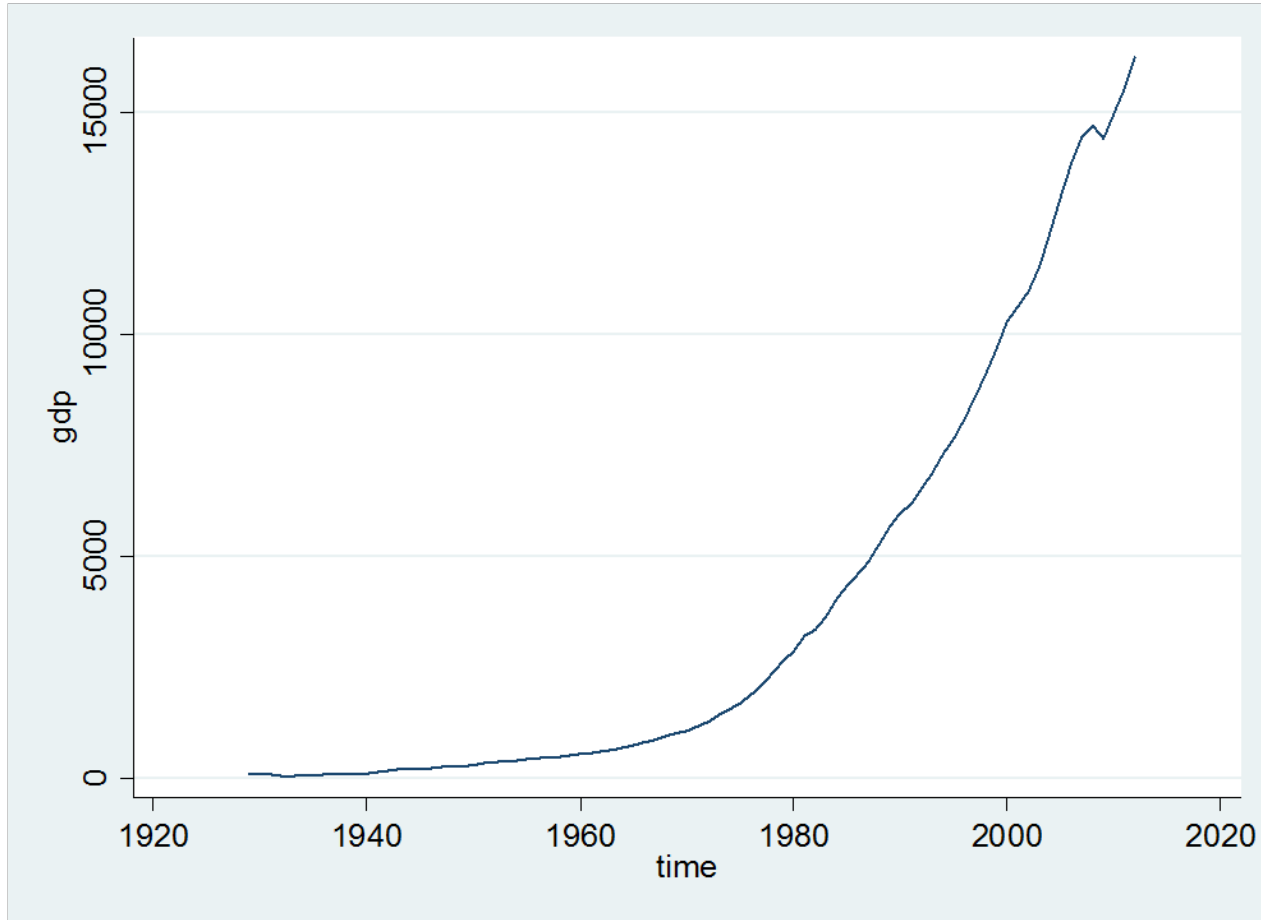
Real GDP
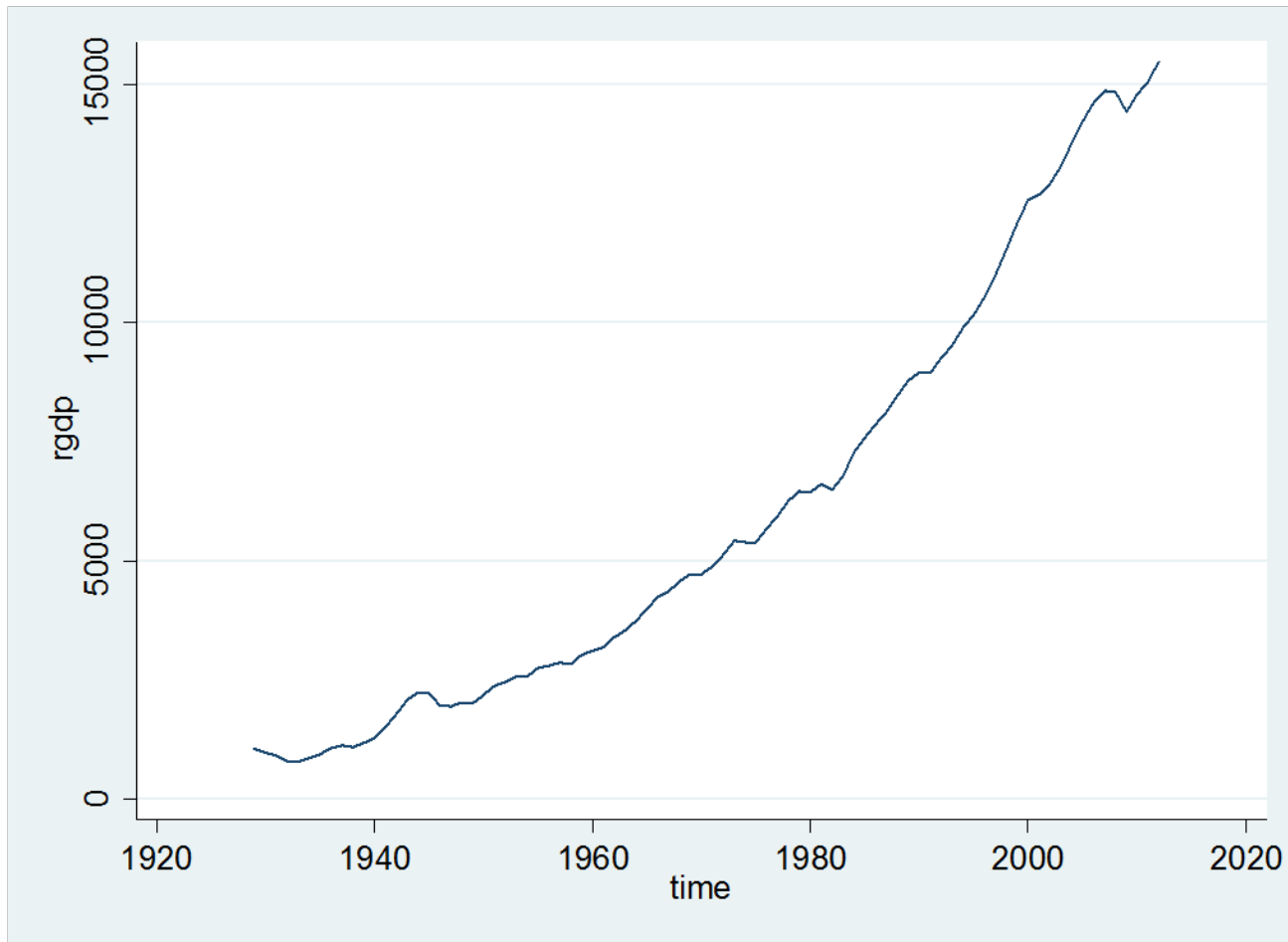
Transformations
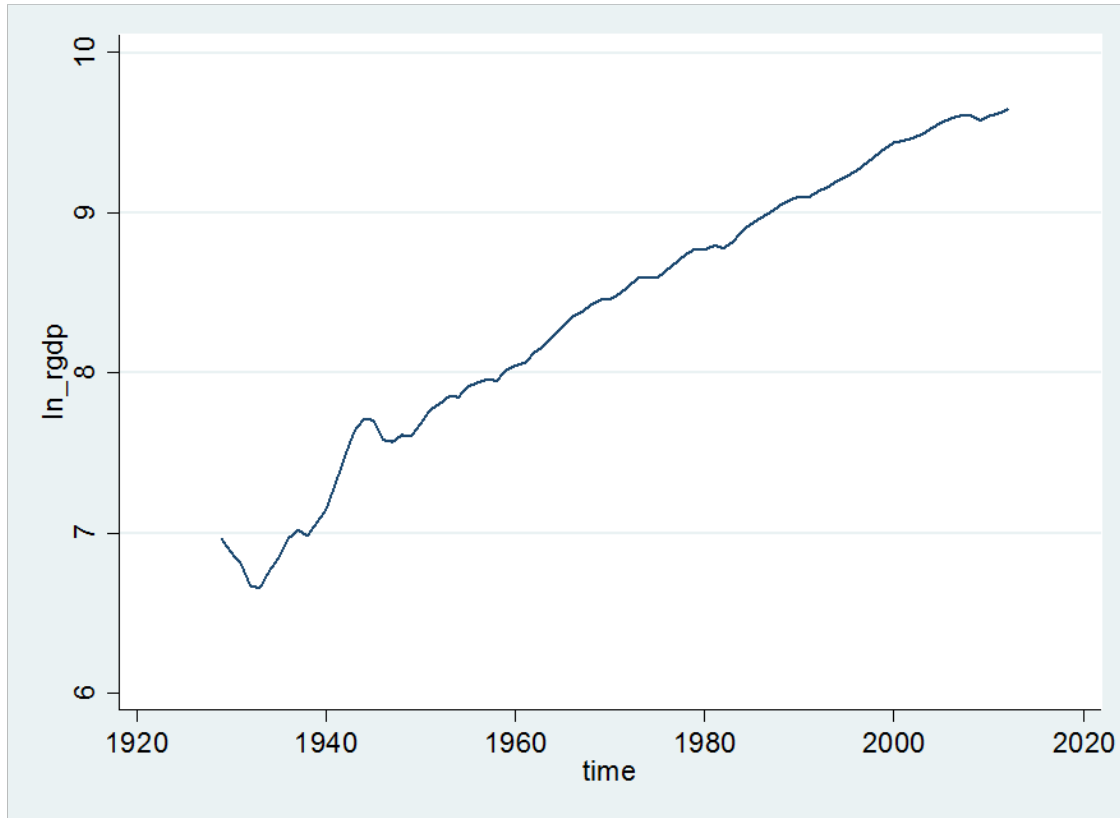
- Multiple Plots
  - tsline gdp rgdp
- Log transform
  - $\ln(y_t)$
  - generate ln_rgdp=ln(rgdp)
  - tsline ln_rgdp
- Differences
  - $\Delta y_t = y_t - y_{t-1}$
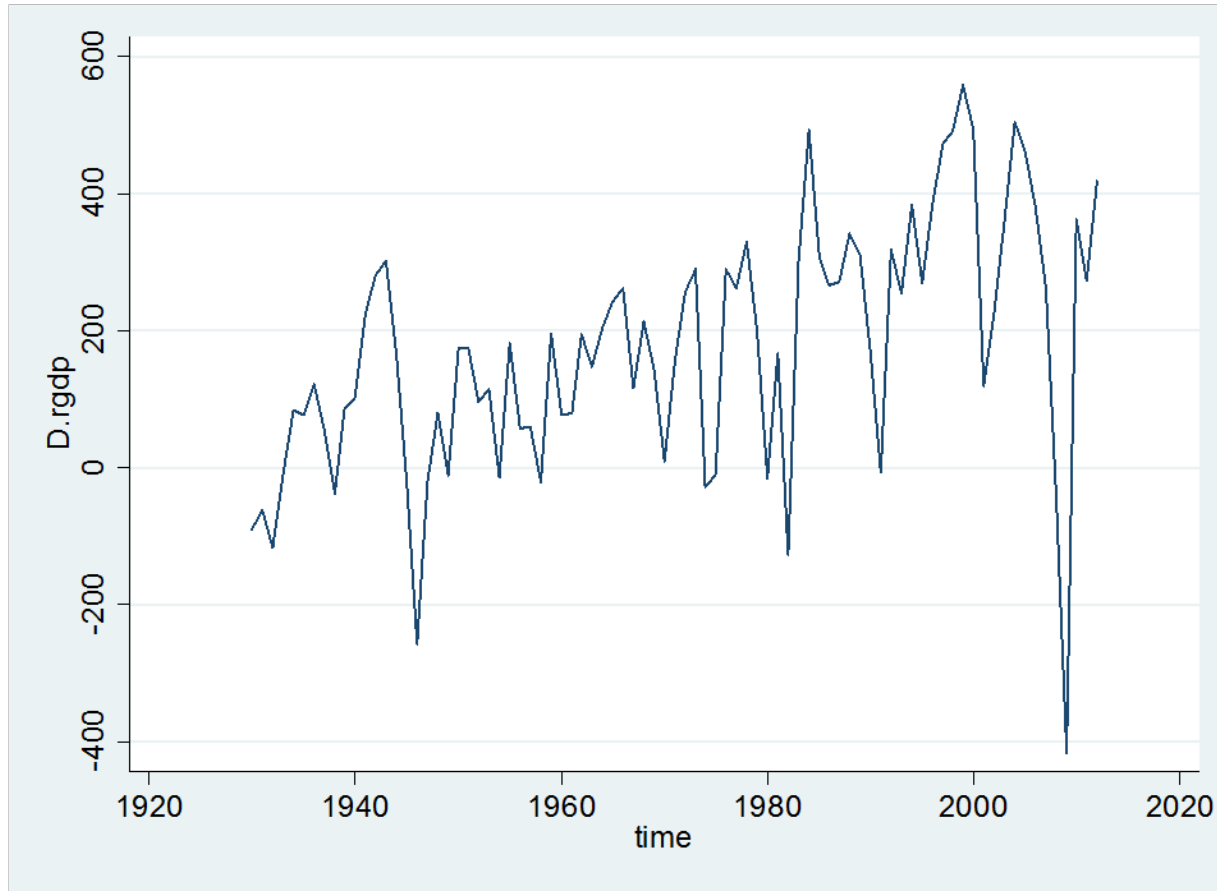 - tsline d.rgdp
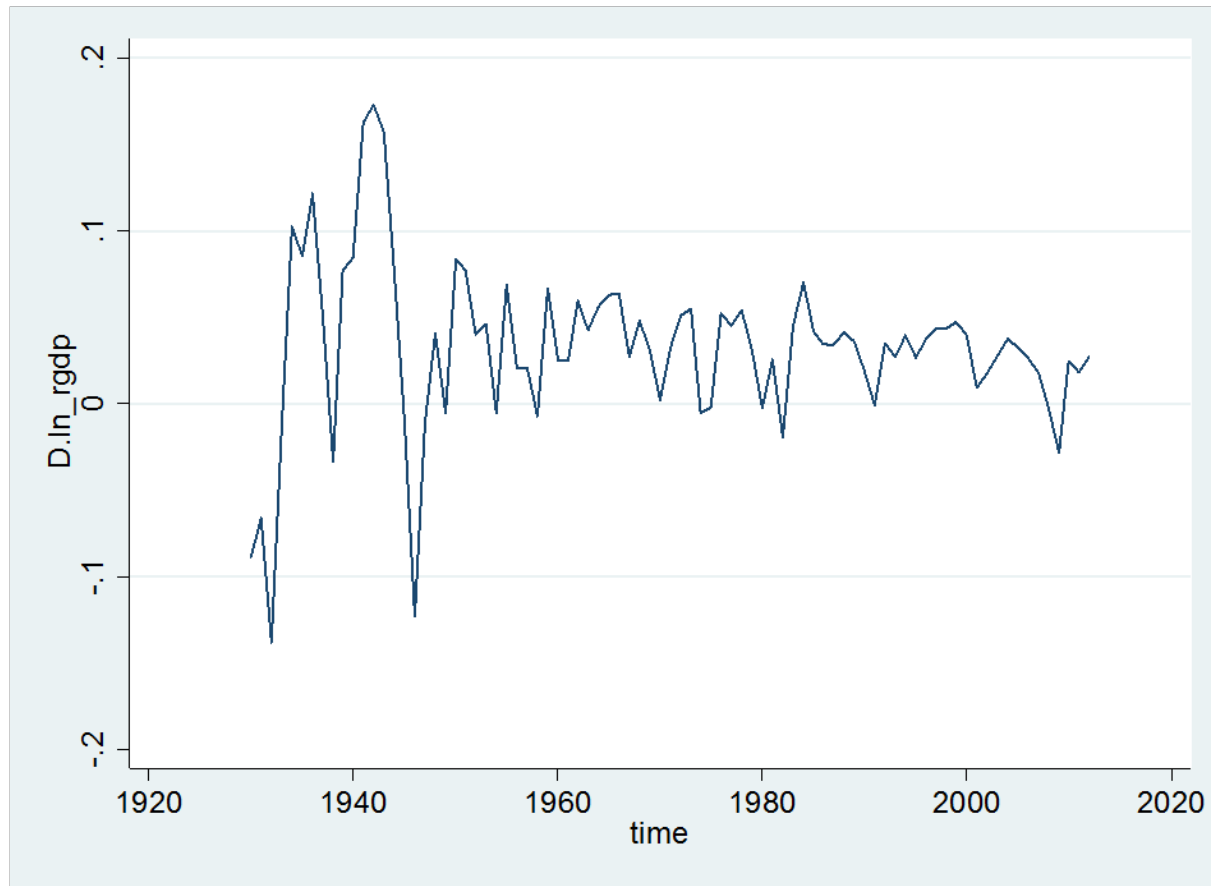 - tsline d.ln_rgdp

GDP and Real GDP

Ln(Real GDP)

Annual Real GDP Change (Differenced Real GDP)

Annual Real GDP Growth Rate
Differenced Ln(Real GDP)

Creating a Dataset

- When done importing data, naming variables, setting the time index, and making transformations, save your file for future use.

- If you want to start over
  - Type clear

Plotting Quarterly Data

- Go back to BEA GDP spreadsheet
- Highlight quarterly data
- Change format to numeric
- Copy, then paste in STATA's Data Editor
- Rename variables to qgdp and qrgdp
- Need to create a time variable
  - Stata does not translate the BEA's time index well

tsmktim utility

- STATA commands are available from the web
- To install tsmktim in STATA
  - Help/SJ and User-written Programs/Search
  - Type tsmktim
  - Click on
    - dm81
    - click here to install
  - Now the command tsmktim has been installed on the computer you are working with.
- For some details, type help tsmktim

tsmktim

- For annual data
  - tsmktim time, start (1947)
    - This creates an annual variable "time", starting in 1947
- For quarterly data
  - tsmktim time, start (1947q1)
    - This creates a quarterly variable "time", starting in the first quarter of 1947
- For monthly
  - tsmktim time, start(1947m3)
    - Starts in third month of 1947
- For our application,
  - tsmktim time, start (1947q1)
  - tsset time
  - tsline qrgdp
  - generate ln_qrgdp=ln(qrgdp)
  - tsline d.ln_qrgdp

Quartely Real GDP
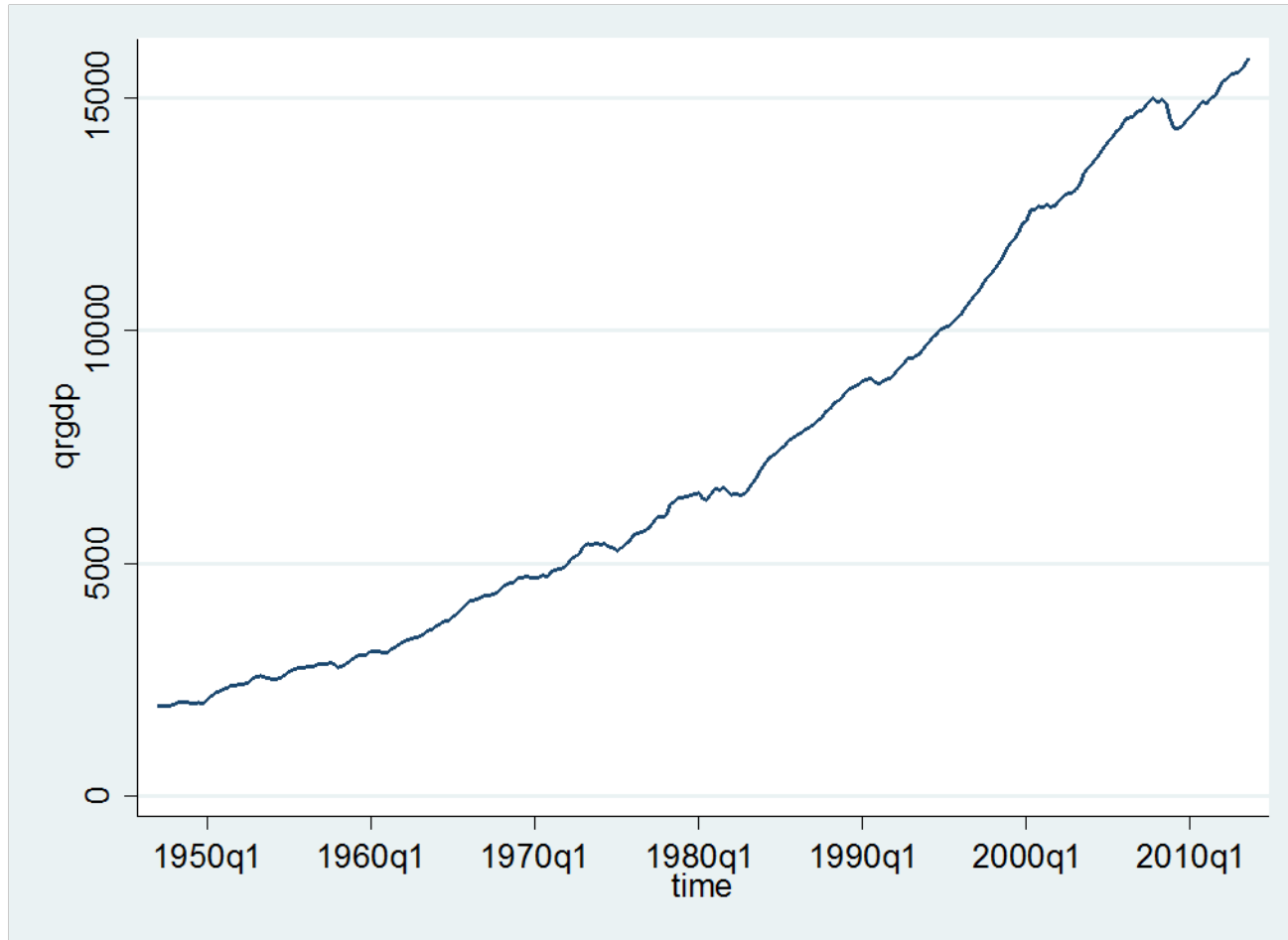
Quarterly GDP Growth Rates
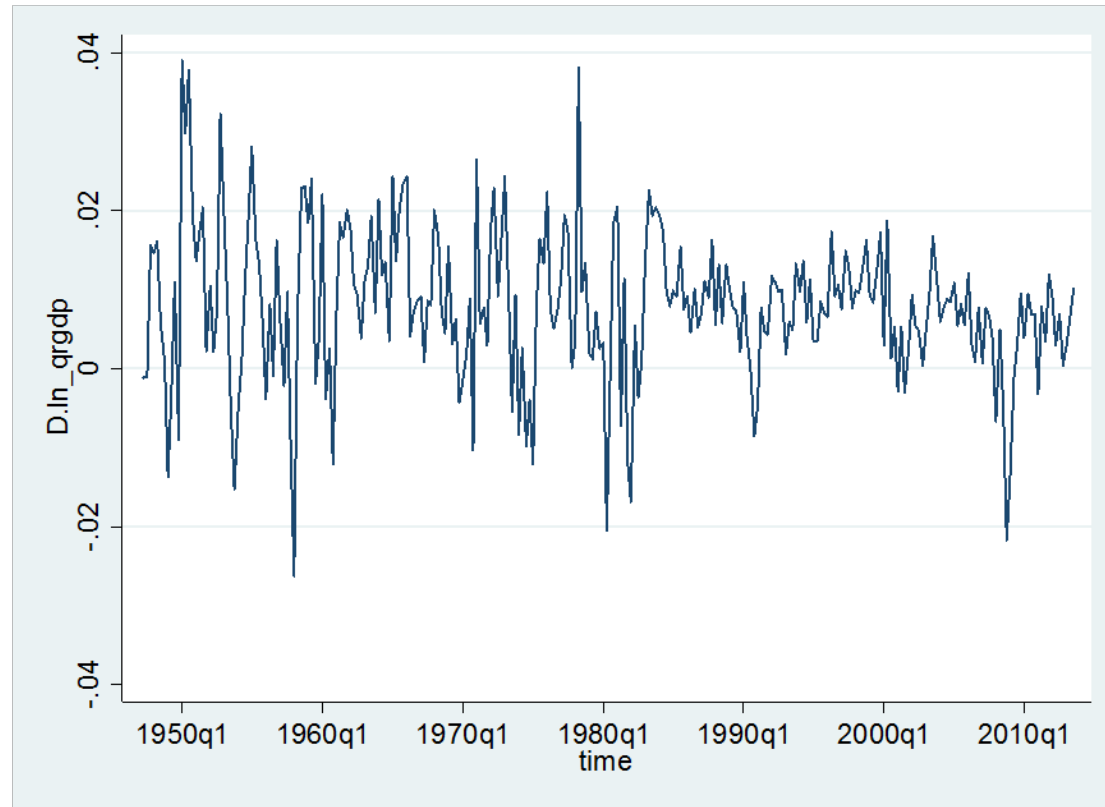
Unemployment Rate Example

- Go to BLS
- Unemployment/National Unemployment Rate
  - CPS Databases
    - Labor Force Statistics – One Screen Data Search
    - Note: This requires Java run-time environment
- Select
  - Men and Women
  - Age: 20-24 years
  - Unemployment Rate
  - Seasonally Adjusted
  - Monthly
- Get Data
 - Note: Requires allowing a "pop-up"

Unemployment Rate Example

- In new screen, change start date to 1948 (earliest available)
- Go
- More Formatting Options
  - Column format
  - Text, tab delimited
  - Retrieve Data
- Data will be in columns
  - Some columns will be not useful
  - Can paste data into Excel, (use text-to-columns to separate), delete unwanted columns, and then paste into STATA. Or, delete variables in STATA (drop var1, etc)

Monthly Unemployment Rates

- Paste data into STATA
- Rename variables ur_men, ur_women
- tsmktim time, start(1948m1)
- tsset time
- tsline ur_men ur_women

# U.S. Monthly Unemployment Rates, Men and Women, ages 20-24
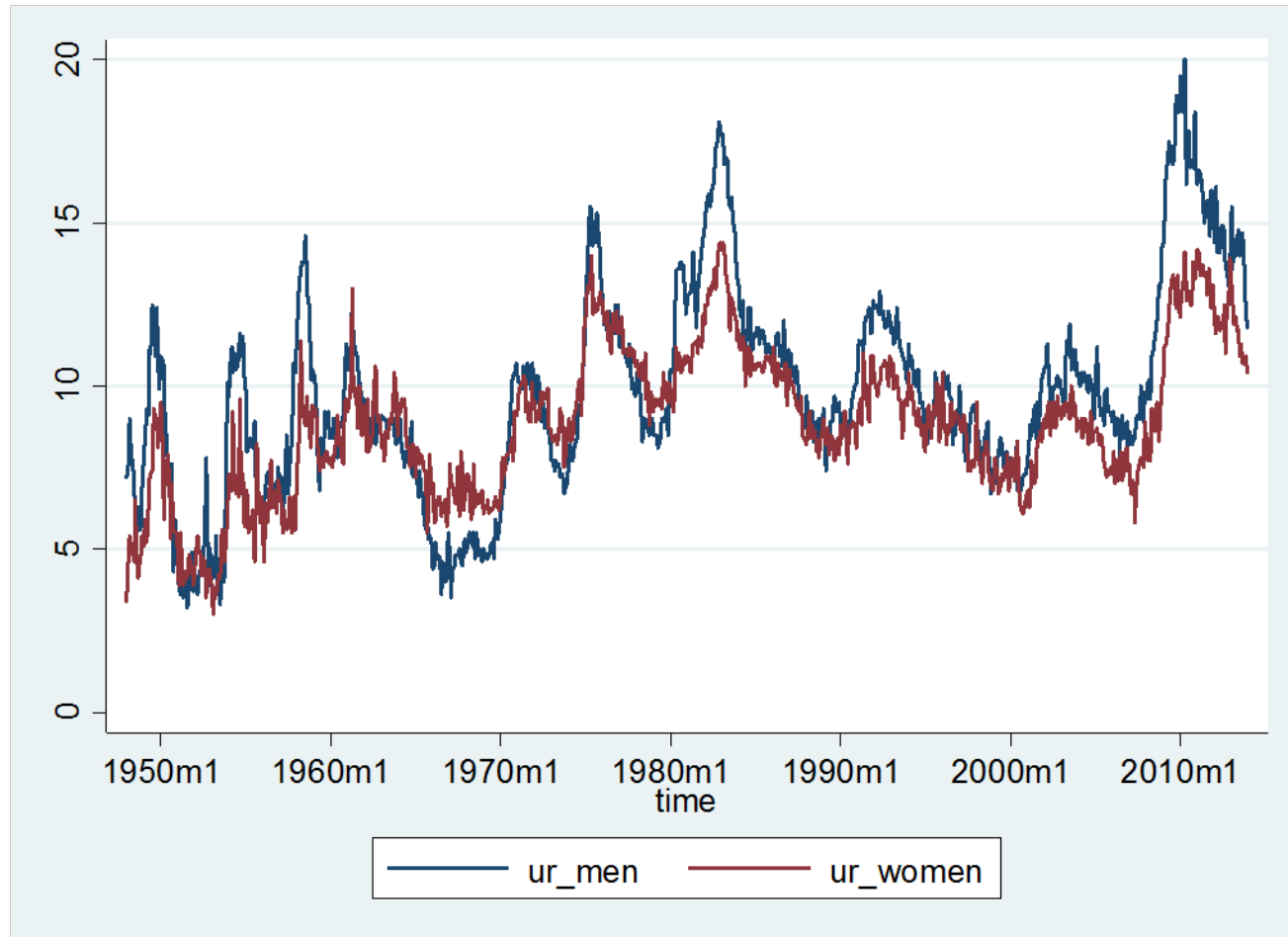
Data Summary

- **summarize**
  - Number of observations
  - Mean, standard deviation, min and max
- **summarize, detail**
  - In addition:
    - Quantiles (labeled percentiles)
    - Skewness and kurtosis

Histogram

- Sometimes a histogram is useful to view
- histogram ur_men
- Using menus,
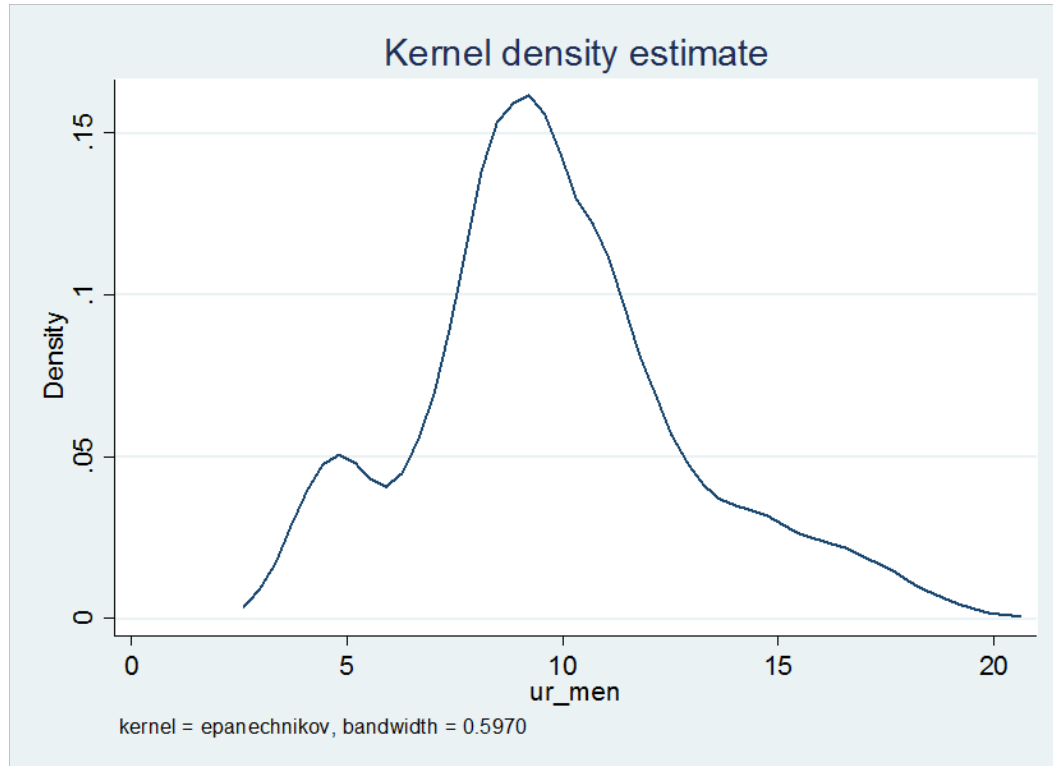 - Graphics/Histogram
  - Select variable
  - OK

Histogram –unemployment rate
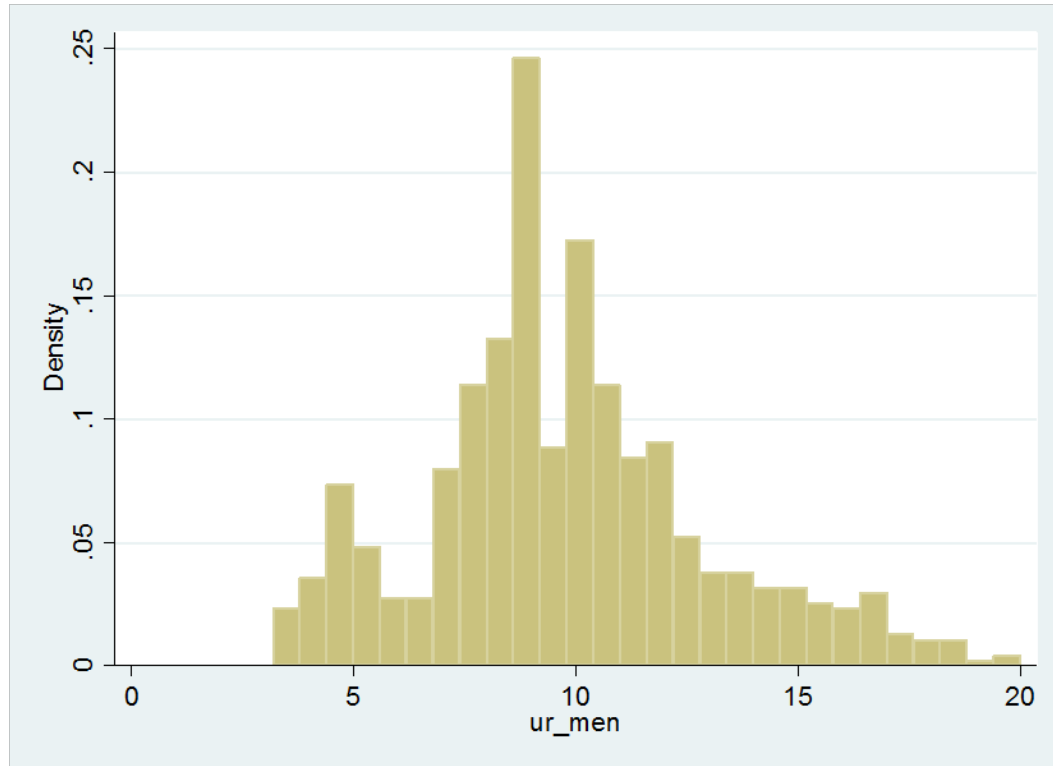
Density Estimate

- A density is a smoothed version of a histogram
- kdensity ur_men
- Using menus
  - Graphics/Smoothing and Densities/Kernel Density Estimation
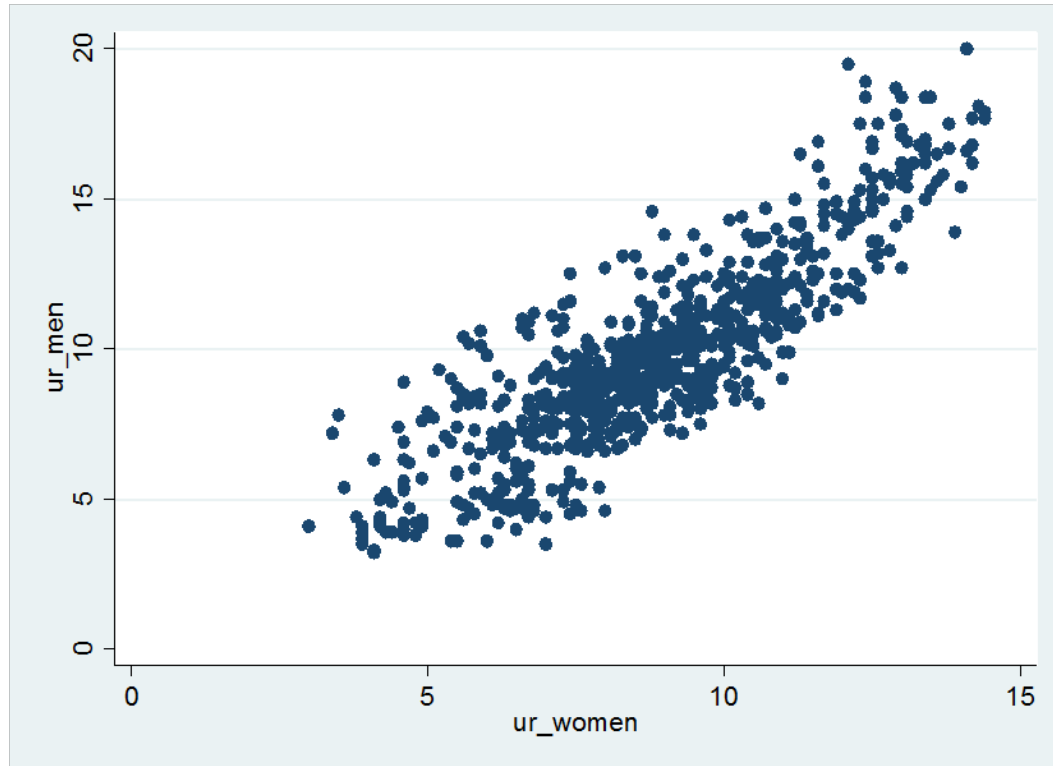 - Select Variable
  - OK

Density Estimate

Scatter Plot

- Sometimes a scatter plot can be insightful
- twoway (scatter ur_men ur_women)
- Using menus
  - Graphics/twoway graph
  - Create
  - Select y and x variables
  - Accept
  - OK

Scatter plot of men and women unemployment rates

Handling Data Organized as a Table

- Go back to BLS/Unemployment/National unemployment rates
- CPS Databases/Labor force statistics/one-screen data search
- Unemployment rate, Not Seasonally Adjusted, Monthly
- Get Data/More Formatting Options
- Table format, text, tab delimited
- Retrieve Data
- The data will appear in a table, each column corresponding to a different month
- The non-seasonally-adjusted data will also have an extra column for "annual" values

Converting for use in Stata

- Copy and paste data table into Stata editor
- The data will be organized by year, with each month a different "variable"
- Delete the final column – annual data (drop var14)
- rename var1 year
- Now you have the variables "year", "var2" … "var13"
- reshape long var, i(year) j(month)
- This command reshapes the data. It looks for all the variables starting with "var" and combines them across "year". The part of the variable name after "var" is put into the new variable "month". You end up with the series "var", "year" and "month"
- The "months" run from 2 to 13. This is because the variables were labeled var2 to var13

Cleaning up

- rename var ur
- Drop the variables year and month (optional)
  - drop year
  - drop month
- tsmktim time, start(1948m1)
  - Generates a monthly time index
- tsset time
  - Declares the data set a time series, and "time" the time index
- tsline ur
  - Plots time series

Non-Seasonally Adjusted U.S. Unemployment Rate
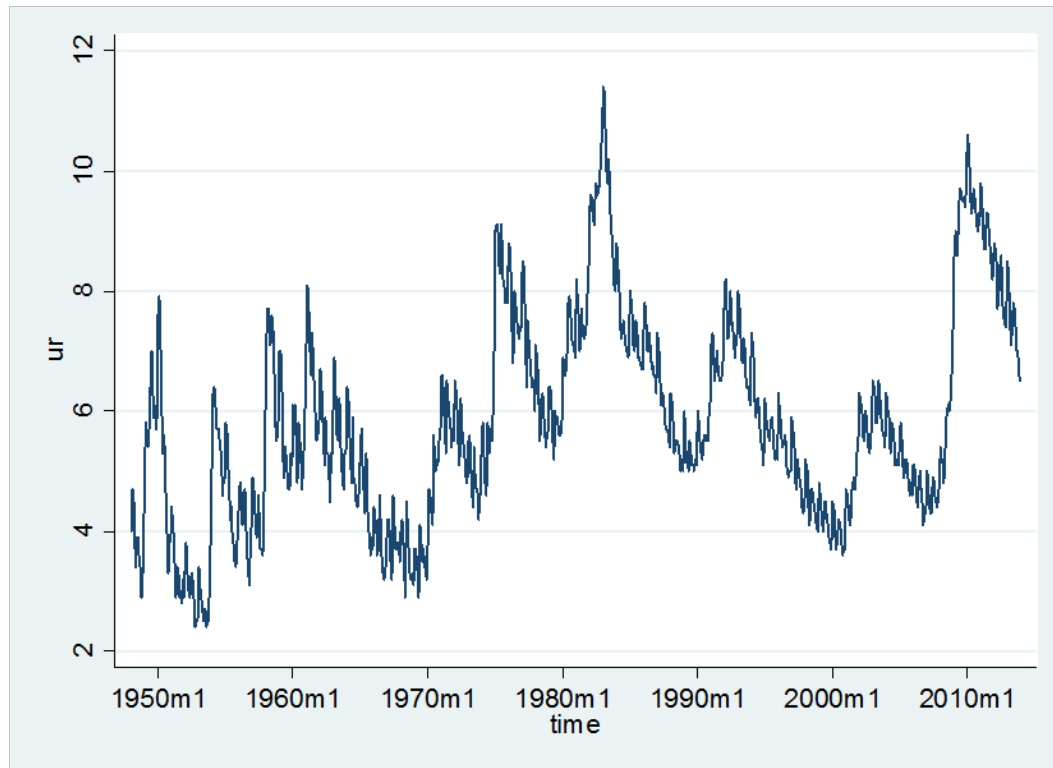
Handling Data with Extra Observations

- BLS/Unemployment/State and Local Unemployment Rates/LAU Databases
- LAUS/One-Screen Data Search
- Wisconsin/Statewide/Not Seasonally Adjusted
- Get Data/More Formatting Options
- Column Format
  - Text/Tab delimited/Retrieve Data
  - Data is in a column, but there are 13 months!
  - Month 13 is "annual"
- Copy and Paste into Excel or STATA
  - Be careful above data marked as preliminary or for revision
  - Always visually double-check data after pasting

- Every 13th observation has month="Annual"
  - We want to delete these
  - drop if var3=="M13"
  - Stata uses "==" to test for equality
- rename var4 ur
- drop var1 var2 var3
- tsmktim time, start (1976m1)
- tsset time
- tsline ur

Wisconsin Unemployment Rate
Not Seasonally Adjusted