Economics 460
Economic Forecasting

• Prerequisite: Econ 410 or equivalent
• Course information is on website
  – http://www.ssc.wisc.edu/~bhansen/460/
• Office Hours
  – Thursdays 1:30-3:30
  – or by appointment
Textbooks

• *Forecasting in Economics, Business, Finance, and Beyond*
  – Francis X. Diebold
  – Online

• *The Signal and the Noise*
  – Nate Silver
  – Supplemental
Computer Software

- **STATA**
  - Continuity with Econ 410
  - Available in Social Science Computer Labs
  - Or via SSCC Winstat server
- **STATA can be purchased directly**
  - Small STATA
    - Up to 1200 observations and 99 variables
    - $35 for 6 months
    - $49 for 1 year
  - STATA IC
    - Up to 2 billion observations and 2047 variables
    - May be better choice if you are doing a senior research project
    - $69 for 6 months, $98 for one year, or $189 for perpetual license
- **Eviews described in textbook, not available here**
- **Excel useful for graphics**
- **For advanced users:**
  - MATLAB, GAUSS, R
Assessment

• Problem Sets (weekly): 15%
• Reading Reflections: 15%
• Project: 25%
• Midterm exam: 20%
• Final exam: 20%
Problem Sets

• Weekly
  – First due next Monday (1/26)
  – Posted on course website
• Conceptual, algebraic, theoretical, and numerical
• Computer analysis
• You can work together, but also attempt everything yourself
Reading Reflections

• Weekly
  – First due next Wednesday (1/28)

• Read one chapter from Silver’s book
  – For example, Chapter 1 “A Catastrophic Failure of Prediction” is about the 2008 financial crisis

• Write a few sentences
  – Something you learned, something you found different than in the primary textbook, something you agree with, or something you disagree with.
Exams

• Midterm: Wednesday March 4
• Final Exam: Wednesday May 13
• Exams will have mix of conceptual, theoretical, and interpretive questions
Forecasting Project

• Goal is to everyone to design an individual project, make decisions, and have some fun
• You will choose a specific time series, make a set of forecasts, and evaluate your success
• You will work on this project throughout the semester.
• The Forecasting Project will require 3 reports
Timing

• You will select a time-series to forecast
• It must have at least one new realization between when you turn in your (second) forecast report and when you turn in your evaluation report.
• For example, if you want to forecast the U.S. GDP for 2015 Q1, the number is announced by the BEA on April 30. You can turn in your forecast up until April 29.
First Project Report

• Due Monday March 23
• Describe the variable
  – Source
  – When future observations will be available
    • This constrains the timing for your second report
  – Where you will find the data
  – Present a time-series of the historical series
Second Project Report

• Forecast Report
• Due one full day before your forecast date, latest by Monday May 4
• Must include:
  – Description of the data, including plots and time-series properties
  – Description of your forecasting method
  – Description of your forecasting model and parameter estimates
• Extrapolation Forecasts
  – A full year of extrapolation forecasts
  – For monthly data, this means a set of 12 forecasts
  – For quarterly data, a set of 4 forecasts

• Point and Interval Forecasts
  – Point forecasts are the expected future values
  – Interval forecasts are possible ranges
  – You will learn these concepts over the semester
Third Project Report

• Due Wednesday May 6
• Brief forecast evaluation
• Compare your one-step-ahead forecast with the actual realization
  – Was the actual value close to your forecast?
  – Did the actual value fall in your forecast interval?
  – Would a decision-maker have been wise to listen to you?
Data for Project

• You select your economic series to forecast
• As this is an economics course, it should be an *economic* series.
• Feel free to ask me about possibilities.
• You can pick a standard economic series, or can be creative.
• I advise against financial series. There is little to forecast, and the project will turn out to be uninteresting.
Data Frequency

• Pick an economic series which is available monthly or quarterly
• Annual series are difficult to fit in our evaluation window
• Weekly is possible, but have extra challenges.
• Daily series have special difficulties which we will not cover
Sample Size

- When you select a time-series, check that there is a sufficient historical record for you to fit a forecasting model.
- If the sample length is too short, you will not be able to fit an meaningful model, and the project will not be interesting.
- I suggest a minimum of 20 years of monthly or quarterly data.
Questions

• In the First Project report, you will describe your selected time-series and data availability
• The purpose is so that you will have assessed feasibility, before you get too far along
• It also gives me a chance to review your project to assess feasibility
Finding Data

• Many economic data series are on the web
• Be careful to check for historical availability. Many only post a few years of observations
• Official government sites are very good sources, and have full historical series
• An excellent starting point is the data page at Resources for Economists: rfe.org
• Links on the course webpage
Example

• Wisconsin Unemployment Rate
• Recent History
  – 5.6% in August
  – 5.5% in September
  – 5.4% in October
  – 5.2% in November
• December 2014 will be announced by BLS next Tuesday Jan 27
• Future Releases by Bureau of Labor Statistics (BLS)
  – January 2015: March 17
  – February 2015: March 27
  – March 2015: April 21
  – April 2015: May 27
<table>
<thead>
<tr>
<th>Date</th>
<th>Point Forecast</th>
<th>50% Interval Forecast</th>
<th>80% Interval Forecast</th>
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<td>(5.1%, 5.2%)</td>
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<td>2015:1</td>
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<td>(4.5%, 6.3%)</td>
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Forecast for Tuesdays' Release
December 2014

• Point Forecast: 5.1%
  – Decline of 0.1% from November

• 50% Forecast Interval
  – [5.1% to 5.2%]

• 80% Forecast Interval
  – [5.1% to 5.2%]
Forecast for March 2015

• Point Forecast: 5.0%
• 50% Forecast Interval
  – [4.8% to 5.3%]
• 80% Forecast Interval
  – [4.7% to 5.4%]
Forecast for November 2015

• Point Forecast: 5.4%
• 50% Forecast Interval
  – [4.9% to 5.8%]
• 80% Forecast Interval
  – [4.5% to 6.3%]
Evaluation

• Last year for this class I made a similar 12-month extrapolative forecast
• The next slide is the forecast I made one year ago
What Actually Happened

• The next slide is the forecast, plus the actual realizations
Wisconsin Unemployment Rate

Unemployment Rate (%)

Actual
Forecast Quantile

10% Forecast Quantile
25% Forecast Quantile
75% Forecast Quantile
90% Forecast Quantile

Point Forecast
Evaluation

- Many of the 12 realizations were very close to the point forecasts
- At the end of 2014, the unemployment rate fell more than forecasted
- All of the 12 realizations were within the 80% forecast intervals
- 11 of the 12 realizations were within the 50% forecast intervals
Upcoming Announcements

• Jan 21 (Wed)
  – Usual Weekly Earnings (BLS)
• Jan 27 (Tues)
  – Regional and State Employment and Unemployment (BLS)
• Jan 30 (Friday)
  – Gross Domestic Product, 4th quarter (BEA)
• Jan 30 (Friday)
  – Employment Cost Index (BLS) Feb 1
• Feb 2 (Monday)
  – Personal Income (BEA)
• Feb 6 (Friday)
  – Employment Situation (BLS)
• Feb 18 (Wed)
  – Producer Price Index (BLS)
• Feb 26 (Thurs)
  – Consumer Price Index (BLS)
Assignments for the week

• Read Chapters 1-2 from Diebold
• Problem Set # 1
  – Due Monday (1/26)
• Read Chapter 1 from *The Signal and the Noise*
  – Reading Reflection
  – Due Wednesday (1/28)