Using Group Behavior to Forecast Distribution of Economic Outcomes

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Panel Remarks Topics Today

- Collaboration between National Association for Business Economics (NABE) and the California Institute of Technology (CalTech)
- Experimental Economics at Work
- Forecast Aggregation Experiments
• Pioneer in experimental economics
• Has established information aggregation mechanisms
• Used to collect information widely distributed in small amounts
• Similar to parimutuel betting but it is not “gambling” — forecasters do not pay and they do not risk their own money
Propriety Designed Markets Work

- Extensive work has been conducted using markets as such devices
- Tradesports.com
- Markets well suited for some purposes (large number of participants, continuously changing circumstances), but have some disadvantages:
  - More complex
  - More time
  - More participants
- Parimutuel mechanism works well as a proxy in providing speed, ease, and accuracy
Status Quo

- Economists develop forecasts
- Average of forecasts reported – the “consensus”
- After report of “actuals,” users compare it to the consensus
- Investors may use this information in gauging financial market activity

Disadvantages of consensus

- Average of each forecaster’s mode – “most likely”
- Not an average of the forecaster’s entire probability distribution of outcomes
Forecast Aggregation Experiments

- Example of nonfarm payroll employment
- Group of 15 NABE forecasters
- All forecasters access CalTech website during a set one-hour period
- Experiment takes place 48 hours prior to the release of actual data from the U.S. Department of Labor
Game Rules

• Forecasters compete for a share in the $2,000 prize
• Each forecaster is given a budget of “game dollars”
  – **Budget used to purchase tickets at known price**
• Forecasters places tickets in buckets representing range of job changes
• Forecasters can place as many tickets in that “bucket” as they would like; may also place tickets in buckets for other job gain or loss ranges
• Here is an example of “buckets” or ranges for total nonfarm payroll employment:
  – **Under 50,000**
  – **50,000 - 75,000**
  – **75,000 - 100,000**
  – **100,000 - 125,000**
  – **125,000 and above**

• It pays to purchase tickets associated with the employment gain for which the subjective expected value is greatest, and it pays to spend the entire budget

• Risk aversion plays no role because the game dollars have no outside value
At the end of experiment, the distribution of tickets purchased in each “range” can be translated into probabilities. Thus, the final output of the experiment is an equally weighted average probability distribution. This can be compared to the consensus and actual results when released by U.S. Department of Labor. The prize is distributed in proportion to how many tickets each forecaster had in the winning bucket.
Results

NABE/CalTech Forecast Aggregation Experiment
Monthly Change in April 2007 Nonfarm Payroll Employment (SA, 000s)

% of Tickets Purchased

Cumulative Probability

Actual: +88,000

14 Participants

Median = 75-99

Mean = 98
NABE/CalTech Forecast Aggregation Experiment
Change in May 2007 Nonfarm Payroll Employment (SA, Thousands of Jobs)

% of Tickets Purchased

Cumulative Probability

Actual:
+157,000

15 Participants

Median = 100,000 - 125,000
Mean = 123,000

Expected change in May Nonfarm Payroll Employment

Below 101
-100 -76
-75 -51
-50 -26
-25 -1
0 - 24
25 - 49
50 -74
75 -99
100 -124
125 - 149
150 - 174
175 - 199
200 - 224
225 - 249
250 - 274
275 - 299
300 - 324
325 - 349
350 - 374
375 - 399
Above 400
• NABE/CalTech are in the process of implementing these experiments over a series of months in order to assess the accuracy of the mechanism as compared to standard consensus and econometrics techniques
• These experiments require seed funds under the auspices of the NABE Foundation
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