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FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

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July 21, 1999

EX PARTE

Ms. Magalie Roman Salas
Secretary
Federal Communications Commission
The Portals
445 12th St. SW
Washington, D.C. 20554

Re: CC Docket No. 98-56 and CC Docket No. 98-121

Dear Ms. Salas:

This is to inform you that on July 20, 1999 Venetta Bridges, Craig Duncan, and I, representing BellSouth, and Dr. Fritz Scheuren and Dr. Edward Mulrow of Ernst & Young met with Daniel Shiman and Alex Belinfante of the Common Carrier Bureau. During the meeting we discussed the continuing efforts of the statisticians at Ernst and Young to develop a method of statistical analysis that the Louisiana Public Service Commission could approve in LPSC Docket No. U22252 – Subdocket C for use in determining whether BellSouth is meeting its statutory obligation to provide CLECs with nondiscriminatory access to UNEs and services. The attached documents formed the basis for that discussion.

Because the Commission has been considering issues related to performance measurements and standards in both proceedings identified above, we are filing notice of this ex parte meeting in both dockets, as required by Section 1.1206(b)(2) of the Commission's rules. Please associate this notice with the record of both dockets.

Sincerely,

Kathleen B. Levitz

Kathleen B. Levitz
Vice President – Federal Regulatory

Attachments

cc: Daniel Shiman (w/o attachments)
Alex Belinfante (w/o attachments)

Consensus Agreements

BellSouth - AT&T

ERNST & YOUNG LLP

EY Econ
Economics Consulting & Quantitative Analysis
EY/Econ-STAT

BST/AT&T Consensus

Independence of Performance Measures

Correlation between the performance measures must be accounted for by aggregating over similar measures.

Trimming

Trimming is needed but finding a robust rule that can be used in a production setting is difficult.

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Comparing Like-to-Like

The need for like-to-like comparisons requires the data to be compared at a very deep level, e.g. wire center, time of month, dispatched, residential, new orders.

- Identify variables that may affect the performance measure.
- Record important confounding covariates.
- Adjust for the observed covariates in order to remove potential biases and to make the CLEC and the ILEC units as comparable as possible.

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Performance Measure Test Statistic

Each performance measure of interest should be summarized by one overall test statistic giving the decision maker a rule that determines whether a statistically significant difference exists.

- The method should provide a single overall index, on a standard scale.
- If entries in comparison cells are exactly proportional over a covariate, the aggregated index should be very nearly the same as if comparisons on the covariate had not been done.
- The contribution of each comparison cell should depend on the number of observations in the cell.
- Cancellation between comparison cells should be limited.
- The index should be a continuous function of the observations.

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Statistical Paradigm

AGREEMENT: The system must be developed so that it can be put into production mode.

- Calculations are well defined for possible eventualities.
- The decision process is an algorithm that needs no manual intervention.
- Results should be arrived at in a timely manner.
- The system must recognize that resources are needed for other performance measure-related processes that also must be run in a timely manner.
- The system should be auditable, and relatively easy to adjust over time.

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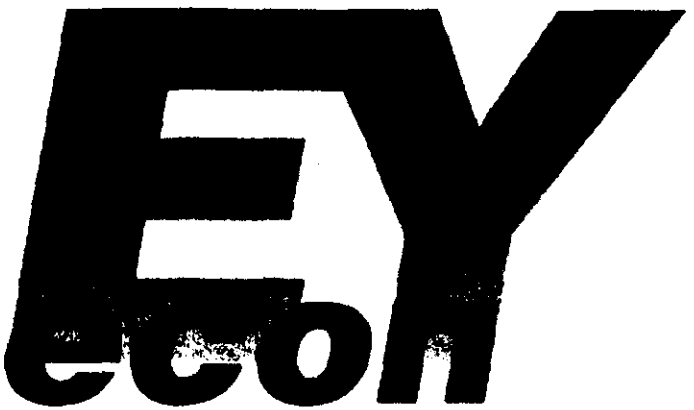
Type I and Type II Errors

Type I and Type II Error probabilities should be balanced.

- A statistical testing methodology should be used so that P(Type I Error) = P(Type II Error) for well defined null and alternative hypotheses.
- The formula for a test's balancing critical value should be simple enough to calculate using standard mathematical functions, i.e. one should avoid methods that require computationally intensive techniques.
- Little to no information beyond the null hypothesis, the alternative hypothesis, and the number of observations should be required for calculating the balancing critical value.



Balancing Test Errors

Approach & Properties

Testing Errors

Decision Error	General Description	In terms of Performance Measure Testing
Type I	Rejecting the null hypothesis (accepting the alternative) when the null is true.	Deciding that BST favors its own customers when it does not.
Type II	Accepting the null hypothesis when the alternative is true.	Deciding that BST does not favor its own customers when it does.

$$P(\text{Type I}) = P(Z < c | H_0)$$

$$P(\text{Type II}) = P(Z > c | H_a)$$

where Z is the test statistic and c is the critical value of the test

Test Hypotheses

- Null Hypothesis: $\mu_1 = \mu_2$

  $\sigma^2_1 = \sigma^2_2$

- Alternative Hypothesis:

  $\mu_2 = \mu_1 + \delta\sigma_1 \quad (\delta > 0)$

  $\sigma^2_2 = \lambda\sigma^2_1 \quad (\lambda \geq 1)$

Balancing Errors

Example:

Test statistic $$Z = \frac{\overline{X}_1 - \overline{X}_2}{\sigma_1 \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

If the critical value is set to

$$c_B = \frac{-\delta}{\sqrt{\frac{1}{n_1} + \frac{1}{n_2}} + \sqrt{\frac{1}{n_1} + \frac{\lambda}{n_2}}}$$

then P(Type I) = P(Type II).

Statistical Difference = Discrimination?

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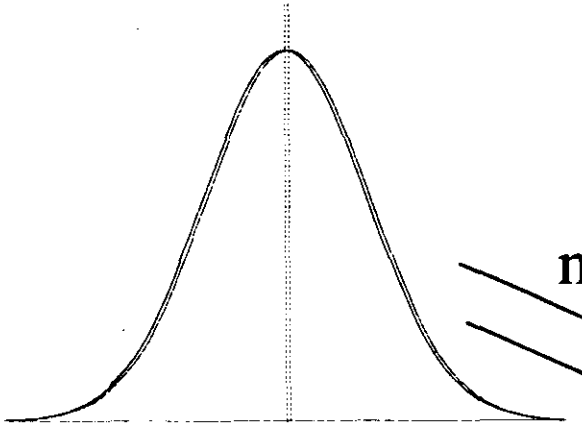
2 Normal Distributions

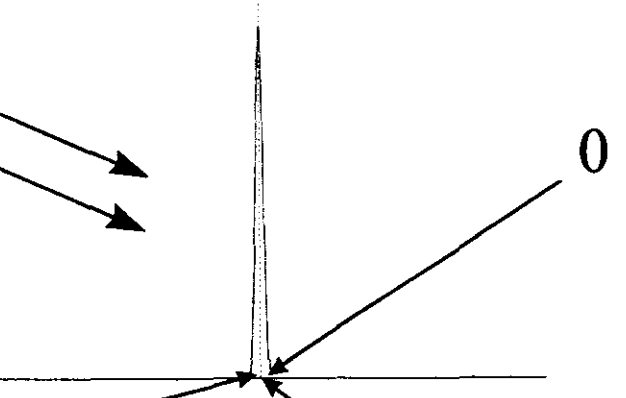
With large enough sample sizes, even tiny differences can be statistically significant.



$\mu_1 = 1$ $\mu_2 = 1.05$

n_1, n_2 large

Distribution of $\overline{X}_1 - \overline{X}_2$



$\mu_{\overline{x}_1 - \overline{x}_2} = -0.05$

significant gap $> 2\sigma_{\overline{x}_1 - \overline{x}_2}$

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Does *Statistical Significance* Imply *Practical Significance* ???

"*Remember also that a significant* t *value is evidence only that the population* means *differ. Popular accounts are sometimes written as if a significant* t *implies that every member of population 1 is superior to every member of population 2.... In fact, the two populations usually overlap substantially even though* t *is significant.*"

(Snedecor and Cochran, *Statistical Methods*)

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Does *Statistical Significance* Imply *Practical Significance* ???

- With very large sample sizes, even small differences can be statistically significant
- One needs to determine when a difference in means has an economic impact for a CLEC.
- Balancing eliminates the problem.

Balancing Over Time

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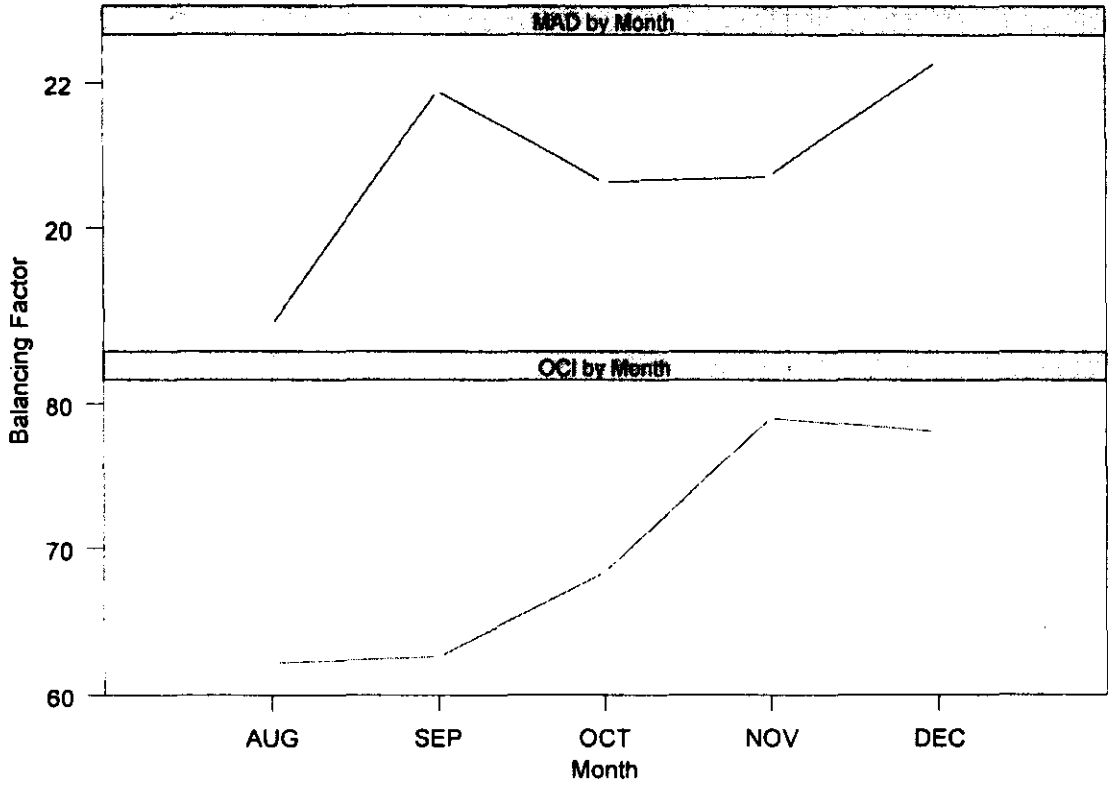

$$\text{Balancing Factor} = \frac{1}{2\sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

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Balancing Over Time

Example

Difference Between Jackknife Statistic and Balancing Critical Value Order Completion Interval