The debate between the CLECs and the ILECs will focus on the value of "D." The ILEC might argue that in "traditional" scientific inquiry, statisticians would be most concerned with falsely concluding that the ILEC is violating the law. Therefore, following such "tradition," the risk associated with such a false conclusion is minimized and the risk associated with falsely concluding that they are in compliance is generally ignored. For example, one is usually reluctant to conclude that a coin is biased and, as noted earlier, one would not conclude that a coin was biased based on results of 54 heads and 46 tails. Indeed, using "traditional" parameters, one would not conclude the coin was biased in favor of heads unless it turned up heads at least 60 times out of 100 tosses.

Assuring parity with respect to Interconnection cannot be viewed as a subject to such "traditional" parameters, however. The stakes are too high. The potential harm to the public's interest in a competitive market of concluding that the ILEC is complying with the performance parity principle when it is not, is as great or greater than any harm that could result from concluding that the ILEC is not complying when it is. **The risk of a monopoly perpetuating its market power by providing inferior interconnection threatens the public more than the risk of a competitor erroneously claiming that performance parity does not exist.** In terms of the coin toss analogy, even though we would not want to reject a fair coin incorrectly, we most certainly would not want to accept a biased coin incorrectly.

TCG's proposal guards against both risks and recognizes the legitimate claims of both ILECs and CLECs. The ILEC does not want to be found in violation of the standard inaccurately and therefore would propose a large "D". TCG does not want the ILEC to get away with poor performance, and

is justified by the Telecommunications Act in arguing that "D" should, in fact, equal zero. It makes eminent sense, therefore, to establish "D" such that **each party bears the same risk of an error against its interests.**

So, What is "D"?

The value of "D" depends on five factors: the number of times the ILEC performs the measured operation for itself and for the CLEC, the variability of the ILEC's performance for itself and for the CLEC, and the CLEC's definition of acceptable ILEC behavior. Of the five, only the last is within the explicit control of one of the parties, i.e., the CLEC.[5] Under the statute the CLEC is entitled to performance that is "at least equal," with no exceptions or qualifications. The extent to which the CLEC is willing to accept something other than "at least equal" is completely up to the CLEC. **In the event that the ILEC objects to the CLEC's position and the issue is sent to arbitration, the arbitrator must select the CLEC's position to comply with the Act.**

The formulas that calculate "D" may appear rather complex (like many statistical formulas), but in fact the calculations are easy to perform in a computer spreadsheet. In general, all else held constant, "D" tends to decline as the number of observations increase, tends to increase as the variability of the ILEC's performance increases, and tends to decline as the CLEC-specified acceptable limit of ILEC performance for the CLEC approaches the ILEC's performance for itself.

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[5] Theoretically, the ILEC may be able to control the variability of its performance for itself and for the CLEC but for statistical purposes we assume that it is not doing so.

Apples to Apples

The danger in any statistical analysis is that it might hide more than it reveals, and that danger certainly exists here. For example, a comparison of averages (such as the mean time to repair) could potentially mask great disparities within the data. The ILEC may be very quick to repair the unbundled loops of the CLEC's many low-volume (and low-revenue) customers, but very slow to repair the unbundled loops of the CLEC's high-volume (and high-revenue) customers. By treating the CLEC's largest customers poorly, the ILEC would hope to convince those customers that they should switch to the ILEC for service. If the ILEC's performance were simply measured by the two sample means, such anticompetitive behavior might go undetected.

The best way to discourage and to detect such anticompetitive behavior is to segment the data so that "apples-to-apples" comparisons can be made. That is, the ILEC's performance towards the CLEC's customers should be compared to the ILEC's performance towards its own similarly situated customers. Customer size and location are two of the obvious criteria for segmenting the data, but there may be others. In any event, steps must be taken to ensure proper analysis of all the data, including a calculation of "D" for each set of data.

Adding Depth and Perspective

As important as it is to evaluate the ILEC's performance each month, it would be a mistake to rely solely upon this "snapshot" of data as the definitive picture of the state of interconnection. To obtain a more complete picture, the ILEC's performance must be examined in its entirety and over time. Otherwise, the ILEC might take advantage of the leeway afforded by

"D" by always providing inferior service to the CLEC but without violating the "Equal Risk" standard. To prevent the ILEC from turning the "Equal Risk" parameters for each measure or for each month into a license to hobble the CLEC systematically, the domain of the "Equal Risk" approach must expand to encompass two additional dimensions.

First, the ILEC's performance should be examined *in toto* each month, not just measure by measure. Suppose, for example, that the ILEC's performance during a particular month was better for itself than for the CLEC on 34 of the 38 measures, but never exceeded the "ILEC + D" bound (that is, 34 of the measures were similar to the bar chart in Example 1, above). Taken separately and in isolation, each measure would not lead to a conclusion that the ILEC was violating the law. But taken together, such evidence paints a rather clear picture of systematic ILEC malfeasance.

Second, the ILEC's behavior should be tracked over time to detect any systematic attempts to mistreat CLECs. For example, suppose that over a period of ten months, the ILEC's performance each month on a particular measure was never "at least equal" but also never exceeded the "ILEC + D" boundary (i.e., as in Example 1). Again, each month's data examined individually would not reveal any ILEC transgression. Taken together, however, the monthly data indicate systematic violation of the Performance Parity Principle.

Swift Enforcement

The "Equal Risk" approach is useless unless the ultimate enforcement mechanism imposes significant penalties on the ILEC for failing to meet even

its relatively liberal standards.[6] "Equal Risk" represents a concession by the CLEC that the ILEC's poor performance might occasionally result from chance or statistical "noise." Regulators must not hesitate, therefore, to impose appropriately severe penalties on the ILECs for *any* violation of the "Equal Risk" standards. Failure to impose swift justice will only encourage the ILECs to turn an equitable inch into a monopolistic mile.

Conclusion

ILEC compliance with the Performance Parity Principle is critical to the successful development of competition at all levels of the telecommunications industry. TCG's "Equal Risk" approach provides regulators, ILECs, and CLECs with an efficient, fair, and valid way to measure ILEC performance. "Equal Risk" minimizes the cost to all parties, including regulators, by establishing reasonable enforcement standards that still discourage ILEC abuses. "Equal Risk" balances the interests of both the CLEC and ILEC so that each bears the same risk of being wrongly judged on the basis of statistics provided by the ILEC. And, "Equal Risk" is based on accepted statistical practices.

ILECs that are genuinely interested in facilitating local competition will embrace both the Performance Parity Principle and the reasonable statistical methods for measuring parity outlined in this paper. They have nothing to fear from close scrutiny of their performance and will earn the rewards inherent in ongoing and consistent compliance with the Performance Parity Principle. ILECs that are intent upon preserving their monopoly position will

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[6] See *Model Regulatory Procedures for the Enforcement of Interconnection Agreements*, November 1997.

oppose or seek to frustrate TCG's reasonable proposal as they have opposed all reasonable attempts to bring the benefits of competition to consumers of local telecommunications services. Such opposition reveals their true intentions and amply demonstrates the need for vigilance and severe penalties for failing to comply with the Performance Parity Principle. In both cases, "Equal Risk" will help ensure that justice is served in the pursuit of Performance Parity.

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