How Many Days in a Year? Creative Cost Modeling and the Cost to Competition

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I. Introduction

TELRIC models are complex, calculating behemoths, based on assumptions more plentiful than cattle in Texas. These characteristics of the cost models provide generous room for chicanery, and the incumbent monopolists are plenty willing to engage in it. No incumbent monopolist, to my knowledge, has been more creative in this respect than Verizon, though others may have been more aggressive. The Forward-Looking-to-Current Cost factor – which does pretty much exactly what you would think – is an ingenious way to pump up forward-looking, efficient expenses to embedded costs under the guise of legitimate adjustments.[1] By spoofing state regulators, Verizon has met with some success with its FLC.

While it is to be expected that parties will debate over important inputs to the models such as fill factors and cost of capital, inputs for which legitimate differences in opinion may exist, the process of cost modeling reached an all-time low when Verizon initiated the debate on how many days there are in a year. Of course, you may say, there are about 365 days a year – 52 weeks with 7 days each. In the northeast United States, however, a year apparently consists of only 251 days (at least according to Verizon Communications). Let me explain.

II. The Days in a Year

An important estimate from the TELRIC models is the cost of unbundled switching. Switching typically consists of two parts: a) a fixed component (the switch port and features) and b) a usage component based on minutes-of-use. Put simply, the task of the cost model is to estimate the full cost of the switch, and then divvy up the costs between the two components of the unbundled local switching price. Since the usage component of the switching price is charged on

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[1] *See* George S. Ford, *In Through the Back Door: Embedded Cost and the FLC* (www.telepolicy.com).

a per-minute basis, the investment assigned to that component must be divided by a measure of total usage.

In describing how the usage portion of total switch investment is converted to a per-minute rate, Verizon's panel of witnesses states, "usage investment was divided by the busy hour total switch MOU capacity to arrive at a busy hour MOU investment for Usage."[2] For expositional convenience, let INV represent usage investment and BHMOU be busy hour MOUs. Next, the panel testifies, "total investment per busy hour MOU was converted to a total cost per busy hour MOU by the application of annual cost factors and investment related loadings." Let F be the factors and loadings, so the total traffic sensitive cost equals F × INV (COST = F × INV). After these three steps, the calculations can be summarized as COST/BHMOU. Finally, this "total was converted to an AHD MOU cost by the application of the busy hour to AHD conversion factor." The AHD MOU conversion factor is the ratio of busy hour minutes to actual total minutes of the business day divided by 251 business days per year [(BHMOU/BDMOU)/251].

So, the final formula for per-minute, traffic sensitive switching cost (TSSC) is

$$TSSC = \frac{COST}{BHMOU} \times \frac{BHMOU / BDMOU}{251}. \quad (1)$$

Simple algebra shows that Equation (1) is the same as:

$$TSSC = \frac{COST}{BDMOU \times 251}. \quad (2)$$

Equation (2) simply states the traffic sensitive switching cost (COST) is divided by annual business day minutes only (i.e., business day minutes, BDMOU, multiplied by business days, 251). Thus, Verizon converts traffic sensitive switching costs into cost per business day MOU, not cost per total MOU. Verizon's computation never includes an adjustment from business day MOUs to total MOUs. While Verizon levies its charges on every MOU, regardless of when the call is made, it derives its cost per-MOU using only business day traffic.

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[2] The calculations are set forth in Verizon Workpaper Part C-2, Section 1, Page 1 of 2 and Part C 3, Section 7, Page 1, and described in the Panel Testimony at pages 158-9 (Massachusetts Cost Proceeding, DTE 0-1-20). The exact same calculations were used in the New York cost proceeding.

The implication of the understatement of how many days are in a year is substantial. Industry standards suggest that weekend and holiday traffic is about half of business day traffic. Thus, the "effective" number of days is 308 days [= 251 + 0.5 × (365 – 251)]. Replacing 251 with 308 in the denominator of Equation (2) reduces *TSCC* by 22.7%. The implications of this overstatement are discussed later in the text.[3]

1. An Analogy

In case my algebra or discussion is a bit difficult for some to grasp, let me clarify the issue a bit with a delicious analogy. Assume we are going to build a bridge across the Butter River to the city of Boxed Chocolate. Mr. Godiva, the mayor of the Boxed Chocolate, has decided that no one should have to wait more than 2 minutes to cross the bridge, and directs the engineers to build sufficient lane capacity to ensure this standard is met. February 14, St. Valentine's Day, is the busiest day of the year, and the engineers build a bridge with sufficient capacity that no car waits more than 2 minutes to cross the bridge on that special day. All said-and-done, the bridge costs $1 million a year in capital costs and expenses.

To fund the bridge, every car passing the bridge must pay an equal share of the costs regardless of what day the car passes the bridge. Expected traffic is 1 million cars annually, with 500,000 cars (or half of all traffic) on St. Valentine's Day.

Verizon's approach to computing the per-car price would be to charge every car $2 (= $1,000,000/500,000). By doing so, the total toll revenue is $2 million ($2×1,000,000)– over-recovering the costs of the bridge by two-fold. The correct approach, of course, is to set the toll at $1 (= $1,000,000/1,000,000). At $1 per car, the costs of the bridge are fully recovered, but no more than fully recovered.

2. Rebuttal

To date, Verizon has yet to provide a legitimate response to the simple algebraic analysis, though not for a lack of effort. The company's earliest response focused on the fact that switches are designed to handle peak traffic, which occurs on business days. True, but this has no bearing on the calculation. Switch investment is recovered over all minutes, so the per-minute rate must be

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[3] The New York Commission made exactly this adjustment, increasing the number of days to 308 (Recommended Decision, Case 98-C-1357, May 16, 2001, p. 147.

computed using all minutes. New York Administrative Law Judge Linsider makes the point clearly:

> Verizon responds that the use of 251 business days is correct inasmuch as the switch must be designed to handle peak traffic, and peak traffic is realized only on business days. Taking account of weekend and holiday traffic volumes in computing the average would result in a figure too low to handle peak load traffic. Verizon's arguments are misdirected, for the issue here is not how to size the switch but how to spread the costs of a properly sized switch over its usage (Recommended Decision, Case 98-C-1357, May 16, 2001, p. 146).

In a later proceeding, Verizon-Massachusetts (apparently conceding the futility of the previous argument) attempted to convince the state commission that the ratio BHMOU/BDMOU was computed during a "particularly busy month (Verizon Initial Brief, DTE 01-20, March 5, 2002, p. 165)." Verizon's point is irrelevant. First, Verizon provides no evidence that the ratio BHMOU/BDMOU is any different in a busy month than any other month. It is quite reasonable to expect that the busy hour usage and total usage increase proportionately.

Second, Verizon provides no evidence that the month used was a particularly busy month. Perhaps this omission was based on the fact that October, the month in question, is not particularly busy. To prove this point, monthly usage data was gathered from ARMIS Form 43-01.[4] The monthly data series was terminated in 1996, so data from 1993 through 1995 was evaluated. A least squares regression model on Massachusetts minutes was used to test for statistically significant differences in monthly usage.[5] The dependent variable of the regression model was an index of usage (actual usage divided by the annual average of usage), and the explanatory variable included a time-trend (monthly) and a dummy variable for the month of October. This specification of the regression provides an average, percentage difference in October usage relative to the monthly average usage for all months (i.e., the estimated coefficient on the October dummy variable). No statistically significant difference in usage for October (relative to the average usage) was found. The average dependent variable for the month of October was 1.04, suggesting that October usage was, on average, 4% higher than the average usage (1.00, by definition). However, the difference between 1.04 and 1.00, when accounting for the trend in the data, was not statistically significant implying that the null hypothesis that "October usage

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4 ARMIS data is publicly available at www.fcc.gov/ccb/armis.

5 New York data was also evaluated and the results were comparable.

is average" cannot be rejected. Ignoring the statistics, a 4% above average usage rate fails to justify a 22.7% cost overstatement.

III. The Impact of Rate Overstatements

While Verizon did not dupe the New York Commission, the New Jersey Commission was not so attentive. What is the impact of the substantial overstatement in switching cost (22.7%)? The answer is obvious; demand curves slope downward, so less competition via unbundled elements is a direct consequence of the overstatement of switching costs. A recent paper by Robert Ekelund and myself estimates the elasticity of demand for loop-switching combinations to be –2.7.[6] Since switching cost are about half of the total cost of the combination (i.e., the UNE-Platform), a 22.7% increase in switching cost is equivalent to a 11% increase in total cost. Given the elasticity of demand of –2.7, the reduction in competition from loop-switching combinations is 27%. Clearly, the implications of the overstatement are significant.

IV. Conclusion

Because the incumbent local exchange monopolists have no incentive to provide unbundled elements to potential and extant rivals, they have every incentive to manipulate the TELRIC models to inflate the price of elements. Given the elasticity of demand for unbundled loops and switching (about –1.4 each), a little cost inflation goes a long way. Arguing about the number of days in a year seems silly, but the impact on competition is severe. Hopefully, in the future, state regulatory commissions will not be duped by Verizon's efforts to inflate switching costs by understating total usage.

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[6] *See* Robert B. Ekelund, Jr. and George S. Ford, *Preliminary Evidence on the Demand for Unbundled Elements* (www.telepolicy.com).