

Insights

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CELL PHONE ROULETTE AND "CONSUMER INTERACTIVE" QUALITY

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Abstract

Under current policies, cell phone consumers face a lower probability of finding the best carrier for their usage patterns than winning at roulette. Corroborating survey data consistently show significant dissatisfaction among cell phone users, network performance is a major issue, and customer "churn" is high. This problem may be traced to a new form of "consumer interactive" quality characteristic of emergent high technology products such as cell phone and broadband services. This problem is unlikely to be resolved by effective search and sampling, efficient secondary markets, or voluntary carrier disclosure. Traditional one-dimensional disclosure responses to this new variation on an old asymmetric information problem should give way to a more multi-faceted and fine-grained policy approach. © 2005 by the Association for Public Policy Analysis and Management

INTRODUCTION

"It's next to impossible to find out how uniform any carrier's coverage really is."
—*Consumer Reports*

As an integral part of their capital expansion and operations and maintenance programs, cell phone carriers routinely collect detailed information on network performance. As a rule, they are aware of any “dead zones” and congestion within their coverage areas and the percentage of “dropped calls” and busy signals.

The Federal Communications Commission (FCC) does not, however, require carriers to publicly disclose such data, and carriers have not voluntarily done so. The FCC has also chosen *not* to report any statistics on blocked or dropped calls at either an industry or carrier-specific level in its required biennial review. Rather, since passage of the 1996 Telecommunications Act, the FCC’s network performance strategy has been to vigorously promote competition, believing that a “competitive market will provide consumers with the level of call quality they desire and that adopting federal regulations . . . [is] not necessary” (GAO, 2003, p. 3).

In its 2000 biennial review, the FCC also explicitly removed the requirement that carriers display coverage maps, believing that “competitive pressures were strong enough to ensure that carriers would continue to supply consumers with information on coverage . . .” (GAO, 2003, pp. 16–17). Carriers have not, however, provided detailed maps.

The FCC’s *laissez-faire* approach has led to an arguably new and important variation on traditional asymmetric information problems. This new problem arises from a “consumer interactive” service quality unique to emergent high technology products such as cell phone and broadband services.

This problem affects millions of users. In the United States alone, the industry has grown to over 140 million customers consuming over 50 *billion* minutes of airtime a month while wireless users now spend more time on cell phones than landlines.¹

A wealth of survey and complaint data from sources as disparate as the Government Accounting Office, the American Association of Retired People, the National Association of State Utility Consumer Advocates, Consumer Reports, J.D. Power & Associates, and the California Public Utilities Commission confirms *this problem is significant*. Customer dissatisfaction is high, and network performance is a major issue. “Churn” rate is likewise high—roughly one-third of users change carriers annually—and quality is the most important reason other than rates.

Consumer interactive quality coupled with a lack of performance disclosure means that cell phone customers now face a significantly lower probability of finding the best carrier for their usage patterns than winning at roulette. In this insight, I explain why this is so and why the phenomenon of consumer interactive quality suggests a more multi-faceted, fine-grained, and individualized policy response than typical one-dimensional disclosure solutions aimed at consumer aggregates.

WHAT IS “CONSUMER INTERACTIVE SERVICE QUALITY”?

Both economic theory and policy practice strongly suggest that asymmetric information “market failures” can often be ameliorated by disclosure standards. The argument: Without disclosure, consumers will make purchasing errors.

This “old idea” underlies virtually all mandatory labeling—from average electricity consumption on major appliances and crash test ratings for new autos to food ingredients and truth-in-lending. There is, however, something quite new and different about the consumer interactive asymmetric information problem that plagues the cell phone industry.

¹ *Cellular News*, p. 1. April 28, 2003. Available at <http://www.cellular-news.com/story/8773.shtml>.

Consider the lowly can of soup. Depending on the brand, it may contain high levels of sugar, sodium, fat, and even alcohol. Accordingly, it would be of great interest to diabetics, high-blood-pressure victims, dieters, and alcoholics as to just which brands contain what—and mandatory ingredient labeling is a simple solution.

Imagine now, however, a “high technology” consumer interactive can of soup whose ingredients are not fixed at all. Rather, depending on where you eat the soup, whether you are eating the soup in a fixed place or moving in your car, what time of day you eat it, and even how many *other* people are eating soup at the same time, your own soup quality will differ markedly! That’s precisely the situation with high technology services such as cellular and broadband. To explore the policy implications, let’s look at this problem more rigorously.

THIS IS *NOT* YOUR TYPICAL PRICE-QUALITY CONTINUUM

In most markets, the quality of competing brands can be laid out on a high-to-low continuum. Higher-quality products and services command higher prices while lower-quality products and services sell at lower prices. In their search-and-sampling processes, consumers with complete information choose that combination of price and quality best matching their preferences.

The cell phone service provider market is distinctly different because service quality is not fixed with brands arrayed along a continuum but rather highly consumer-interactive, and no *one* carrier will provide the best service quality for *all* consumers. Instead, the best brand for any particular consumer will depend on the interaction between the supplier’s unique network performance characteristics and the consumer’s equally unique usage patterns.

Consumer usage patterns vary by time of use, traveling habits, and business and residential locations. Inter-carrier network performance varies because of technology differences (for example, CDMA vs. TDMA), the opportunistic patterns and pace of capital outlays (for example, number and dispersion of base stations), the strategic choice of network boundaries, and other factors. Such network performance variance and its implications for consumer interactive quality are illustrated in Figure 1, which depicts the coverage maps of two competing cell phone carriers—call them “Splint” and “Singular.”

Splint’s dead zones and congested areas are represented by shaded rectangles, Singular’s by shaded ovals. Note that *both* carriers suffer from dead zones and congestion across the *entire* coverage area. However, Splint has more complete coverage in the northern hemisphere. Singular has much better southern coverage.

Suppose, then, Consumer A and Consumer B are friends, and Consumer B lives and frequently travels within segments of the Splint’s coverage area that are relatively free of dead zones and network congestion. Absent detailed coverage maps, neither Consumer A or B can tell *ex ante* what their cell phone experience will be like.

After months of experience, Consumer B is impressed with Splint’s coverage. Accordingly, when Consumer A asks Consumer B to recommend a carrier, Consumer B recommends Splint. However, Consumer A happens to live and travel frequently within other segments of the coverage area where Splint’s dead zones and network congestion are ubiquitous.

Months later, Consumer B no longer speaks to Consumer A after being berated for his Splint recommendation. Consumer A has cancelled his service with Splint and switched to Singular. While he had to incur steep termination penalties with Splint and buy a new phone, at least Singular service is better.

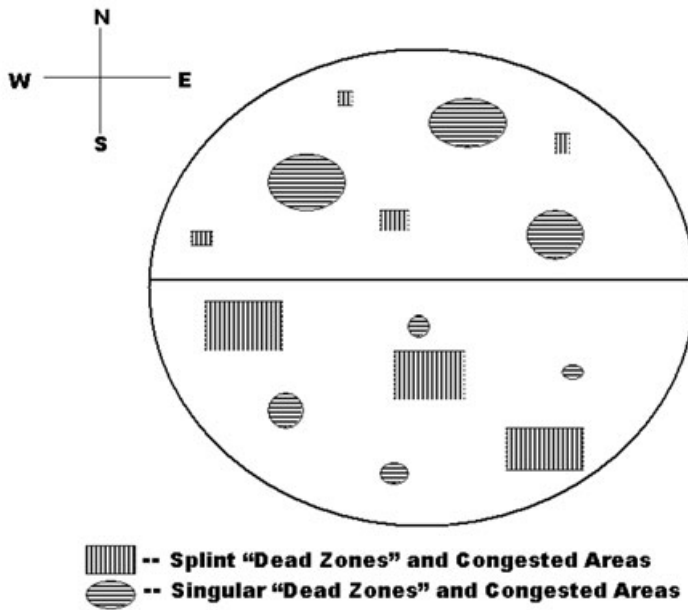


Figure 1. Coverage maps for Splint and Singular.

From this example, you can see that when consumers are denied access to readily available performance data, the odds of finding the best carrier for their usage patterns are unfavorable. In a two-carrier market, these odds are just 50–50, only slightly better than winning at roulette; and most markets have multiple carriers.

WHY FREQUENT PRODUCT SAMPLING WON'T SOLVE THE PROBLEM

If consumers can frequently sample at low relative cost, they can quickly iterate to their unique product quality and price combinations without regulatory intervention. However, with cell phones, low-cost sampling is discouraged by substantial *barriers to exit and reentry*. To buy into a carrier network, a consumer must buy a phone that can use the carrier's technology. A consumer must then pay an "exit penalty" and also purchase a new phone with each switch—as Consumer A had to do in our example.

Some cell phone service providers partially mitigate reentry fees by offering free or subsidized phones—but only if the consumer signs a one- or two-year contract with substantial exit penalties. These long-term contracts represent an important barrier to exit that likewise discourages frequent sampling.

WHY THE SECONDARY MARKET FOR INFORMATION WON'T WORK

Secondary market agents may emerge to help fill any asymmetric information gaps. Consumer groups regularly make survey and complaint data available to members while journalistic sources like *Consumer Reports* have published similar informa-

tion. Informal agents such as friends, family, and acquaintances may likewise provide “word of mouth” testimonials.

There is, however, a significant *public goods problem* here: Because nonmembers of a consumer group or nonsubscribers to a magazine can “free ride,” the flow of information is likely to be undersupplied.

More important, because of consumer interactive product quality, both consumer groups and journalistic sources face a daunting data reliability problem. Consider our earlier example. Consumer B might post a comment on a consumer group’s Web site praising Splint while Consumer A pans the service. If neither provide additional information on where they live and travel, the information is useless. Even worse, if only Consumer B posts the information, consumers with Consumer A-type profiles get a bad signal—literally.

Finally, the considerable product quality heterogeneity across both *regional* and *local* portions of the carriers’ networks make it extremely difficult for publications like *Consumer Reports* to provide enough “fine-grained” data.

Why Carriers Haven’t Voluntarily Disclosed

U.S. cell phone providers have refused to voluntarily disclose their detailed performance data or publish detailed coverage maps. Why this is so can be illustrated with a simple game based on the coverage maps previously illustrated whereby Splint supplies better service in some areas and Singular provides better service in others.

Each carrier must choose between two strategies: (1) disclose performance data and detailed coverage maps; or (2) don’t disclose. The associated payoffs are illustrated in Table 1.

The downward-sloping diagonal payoffs reflect the assumption that absent complete information, consumers will overconsume relative to an efficient market outcome (for a graphical explanation, see, for example, Weimer and Vining, 1989, p. 68). This leads to an associated *higher price and higher quantity sold in the market*. This might yield a payout of, say, (20,20) in the lower right-hand corner when both companies don’t disclose. In contrast, when the consumer is fully informed, both price and quantity fall yielding a lower ordinal scale payout of, say, (10,10).

To calculate the upward-sloping diagonal payoffs when one carrier discloses and the other doesn’t, we can make this intuitive assumption: If one carrier voluntarily discloses and the other doesn’t, *the nondisclosing carrier can use the other carrier’s information to exploit vulnerabilities in its rival’s coverage area*.

For example, the nondisclosing carrier might target a marketing effort at the vulnerable areas, allowing it to increase its market share and payout relative to its rival. However, because the vulnerabilities of each carrier are limited, neither rival will be able to drive the other rival’s profits or market share to zero. Under these assumptions, we can set the payouts in the two “Disclose, Don’t Disclose” cases to (15,25) and (25,15), respectively. This structure preserves the appropriate ordinal relationship between the various payouts in the entire game.

Table 1: The cell phone carrier’s data disclosure game.

| Splint | Singular | |
|----------------|----------|----------------|
| | Disclose | Don’t Disclose |
| Disclose | 10,10 | 15, 25 |
| Don’t Disclose | 25,15 | 20, 20 |

What, then, is the solution? If Singular chooses to disclose, Splint will get a payout of 10 if Splint also discloses but a payout of 25 if it doesn't disclose. Thus, the best strategy for Splint is not to disclose.

Similarly, if Singular chooses not to disclose, Splint will get a payout of 15 if Splint discloses and a payout of 20 if Splint doesn't disclose. Thus, the best strategy for Splint is likewise not to disclose. This is a Nash equilibrium in which competition leads to nondisclosure.

POLICY IMPLICATIONS

There are numerous examples of well-intended but poorly designed mandatory disclosure requirements not serving the intended purpose. This cautionary note is important here because consumer interactive product quality problems likely require a more multi-faceted and fine-grained policy approach than traditional solutions aimed at consumer aggregates.

Consider, for example, imposing traditional minimum performance standards, e.g., each carrier shall have no more than two percent dropped calls. Any given carrier might meet the overall standard in its coverage area but have high quality variances in the sub-areas that matter greatly to individual consumer choice.

Similarly, mandating a longer "free trial period" might lower consumer switching costs but may not substantially lower total search costs. Indeed, absent fine-grained coverage maps, consumers would still have to cycle through carriers in a Las Vegas roulette approach until they found their "best" carrier.

In this context, consider the comprehensive and more "granular" approach in the "Cell Phone Users Bill of Rights" (S-1216) proposed by Senator Charles Schumer (D-NY). In correctly acknowledging an asymmetric information market failure and barriers to exit and reentry, S-1216 notes, "Consumers may not be aware of the deficiencies in wireless telephone service quality until after they have signed a contract, and exorbitant early-termination penalties effectively lock consumers into undesired, long-term contracts."

As an appropriate remedy, Section 5 stipulates that "Each wireless telephone service provider shall make available a map showing the wireless telephone service area of such provider." Acknowledging the highly interactive nature of service quality, the bill likewise insists that "Each such map shall contain the *maximum practicable level of granularity*" [emphasis added]. Moreover, recognizing that service quality will vary over time as coverage and technology improve and user patterns shift, the bill requires that these maps be updated "not less often than quarterly."

The bill would also restore the role of the FCC in monitoring wireless service quality by "requiring semiannual reports by wireless telephone service providers on dropped calls, blocked calls, known coverage gaps . . . or dead zones, [and] predicted street level signal strength."

* * *

Given its comprehensive and fine-grained approach, the policy solutions offered in S-1216 would clearly go a long way toward resolving the asymmetric information problems currently plaguing the cell phone service industry. Note, however, that the consumer interactive problem described herein is not unique to cell phones but affects an emerging class of high technology products.

For example, the "best" broadband provider for any given customer will depend on a broad array of consumer interactive factors that range from obvious issues of location and time-of-use to more subtle issues such as the quality of one's telephone

lines, carrier imposition of so-called “bandwidth caps” that limit speed, and even the specific web sites one commonly visits.

The broader point: Consumer interactive quality in emerging high tech products turns an ordinary “labeling problem” with a traditional “aggregate solution” into something much more challenging and interesting.

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