

Regulating Wireless Phones in California: An Economic Analysis¹

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The California Public Utility Commission (CPUC) is considering enacting a Telecommunications Consumer Bill of Rights. This paper analyzes key economic issues as they relate to wireless telephone service, outlining arguments for possible market failure, costs and benefits of regulation, policy experience in related areas, and alternative institutions protecting consumer choices. High subscriber growth, new entry by competitors, varied pricing plans, third-party evaluations, substantial customer acquisition investment (including “free” mobile phones), and other factors indicate that market mechanisms are efficiently providing service information to consumers. The complexity of wireless telephone networks further suggests that regulation will be no more successful than in cable TV markets, where extensive controls proved counter-productive for consumers. This conclusion is reinforced by previous state regulation of wireless telephone service. When cellular rate regulation was pre-empted by federal law in 1993, California regulators were among those who predicted that prices would rise and consumer interests would be harmed. In fact, the removal of controls had no adverse impact on subscribers, while enhanced market competition (with PCS licenses issued in 1995) led to dramatically lower prices and higher quality networks than when state regulators maintained rates as “just and reasonable.”

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I. The Evolving Wireless Telephone Market

“Were it our choice, we would license additional carriers to assure the public the full benefits of a well-working competitive industry without a need for substantial regulatory intervention.”

California Public Utilities Commission, 1990³

“We envision that in the not too distant future market forces of competition will police the mobile market and allow for an orderly withdrawal of government oversight.”

California Public Utilities Commission, 1994⁴

The California Public Utility Commission has proposed a substantial new layer of regulation on the wireless telephone sector.⁵ These rules cannot directly control rates charged by carriers because of federal pre-emption.⁶ The rules may, however, substantially alter the way in which wireless operators create, deliver, and market their services.

The proposal runs counter to fundamental trends within the sector. Former Federal Communications Commission Chairman Reed Hundt considered the deregulation of wireless a proud achievement.⁷ The FCC has noted that competition, not regulation, has produced substantial improvements for consumers and has pointed to wireless telephone service as a shining example of deregulation. Large increases in subscribership have been driven by massive investments in network infrastructure, growing network coverage, improved digital services, advanced telecommunications functionality, and rapidly falling rates. These observed developments are widely interpreted as signaling successful policies that have allowed the sector to develop without monopoly restrictions, on the one hand, or regulatory distortions, on the other. The current FCC Chairman, Michael Powell, calls the industry a “poster child . . . [for] market economics and the benefits of the competitive model.”⁸

³ California Public Utility Commission, D.90-06-05, slip op., 5. Quoted in California Public Utilities Commission, Petition of the People of the State of California and the Public Utilities Commission of the State of California to Retain State Regulatory Authority Over Intrastate Cellular Service Rates, submitted to Federal Communications Commission, In the Matter of Implementation of Sections 3(n) and 332 of the Communications Act, Regulatory Treatment of Mobile Services, PR 94-105, PR File No. 94-SP3 (Aug. 8, 1994) [“CPUC 1994b”], 13.

⁴ CPUC 1994b, 80.

⁵ See: <http://www.cpuc.ca.gov/static/industry/telco/billofrights.htm>. See also: California Public Utilities Commission, *The Status of Telecommunications Competition in California: Second Report for the Year 2002* (Feb. 28, 2003), Sec. 4.6.2.

⁶ See Omnibus Reconciliation Budget Act of 1993, Section 332(c)(3).

⁷ “We totally deregulated wireless.” Reed Hundt, *YOU SAY YOU WANT A REVOLUTION* (New Haven: Yale University Press, 2000), 98.

⁸ Michael Powell, FCC chairman, dialogue with Thomas Wheeler, president of the Cellular Telecommunications & Internet Association, CTIA National Convention (Orlando, Fla., Mar. 19, 2002).

TABLE 1. GROWTH IN U.S. WIRELESS TELEPHONE SERVICE, 1991–2002

<i>Survey Period</i>	<i>Minutes of Use</i>	<i>Estimated Subscribers</i>	<i>MOU/Sub</i>	<i>Total Service Revenue (000s)</i>	<i>Cost per Minute</i>	<i>Penetration Rate</i>
1991	11,154,015,983	7,557,148	123	5,708,522	\$0.51	2.9%
1992	13,567,533,156	11,032,753	102	7,822,726	\$0.58	4.2%
1993	19,160,964,277	16,009,461	100	10,893,175	\$0.57	6.1%
1994	26,950,000,239	24,134,421	93	14,229,922	\$0.53	9.1%
1995	37,767,122,723	33,785,661	93	19,080,239	\$0.51	12.6%
1996	51,970,200,176	44,042,992	98	23,634,971	\$0.45	16.3%
1997	62,923,082,455	55,312,293	95	27,485,633	\$0.44	20.2%
1998	89,010,438,637	69,209,321	107	33,133,175	\$0.37	25.1%
1999	147,725,958,780	86,047,003	143	40,018,489	\$0.27	30.9%
2000	258,854,860,127	109,478,031	197	52,466,020	\$0.20	38.3%
2001	456,964,165,225	128,374,512	297	65,316,235	\$0.14	44.4%
2002	619,000,000,000 ^a	140,766,842	366	76,508,187	\$0.12	47.7% ^a
1991-2002 Growth	5,449%	1,763%	198%	1,240%	(76%)	1,545%

^a Rounded values.

Note: MOU/Subs expressed monthly.

Source: Cellular Telecommunications & Internet Association, WIRELESS INDUSTRY INDICES SEMI-ANNUAL DATA SURVEY RESULTS (Aug. 2002), and <http://www.wow-com.com/industry/stats/surveys/>.

The metrics accounting for this verdict suggest an industry almost uniquely weathering the “tech recession” post-2000, posting impressive gains in deployment despite adverse financial conditions. By June 30, 2002, there were 135 million wireless subscribers nationwide⁹, as against about 188 million landlines (167 million provided by incumbents, or ILECs, and 21.6 million by entrants, or CLECs).¹⁰ Several million U.S. households have gone all-wireless,¹¹ 18 percent of consumers consider the wireless their primary telephone,¹² and 26% of wireline minutes have been displaced by wireless phone calls.¹³ In California, there were nearly 16 million wireless subscribers at year-end 2002, proportionally higher than nationally.

⁹ <http://www.wow-com.com/industry/stats/surveys/>.

¹⁰ Federal Communications Commission Releases Data on Local Telephone Competition, FCC, (Dec. 9, 2002).

¹¹ Three percent of U.S. consumers have a wireless phone in the home, but no wireline connection. With a national population exceeding 280 million, this aggregates to nearly nine million individuals. *U.S. Wireless Use to Nearly Double by 2006—Study*, WIRELESS REVIEW (Sept. 16, 2002), <http://www.wirelessreview.com/microsites/newsarticle.asp?mode=print&newsarticleid=26>.

¹² As cited in “Federal Communications Commission, *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, Seventh Report.*”

¹³ *U.S. Wireless Use to Nearly Double by 2006—Study*, op cit.

In 1993, federal policy makers pre-empted rate regulation of wireless phone service by state regulatory commissions. Beginning in 1995, up to six new personal communications services (PCS) operators were licensed to compete with existing cellular operators in each U.S. market.¹⁴ The resulting market performance has been dramatic. Between 1991 and 2002, subscribership grew nearly 1,800 percent; minutes of use grew three times as fast. Networks substantially expanded coverage areas, offered an array of new features for customers, and became much cheaper to use. Consumers responded by dramatically increasing wireless telephone usage. This occurred without any state regulation of rates and without the service standards the CPUC is now considering.

Federal regulators and market analysts have been nearly unanimous in their assessment that market competition has produced an enviable state for wireless phone subscribers. “The US wireless industry remains one of the most competitive markets globally,” notes an analysis by Morgan Stanley, Dean Witter. “[T]he fragmentation of the market has led to an environment with growth but nearly perfect competition—a state known as ‘Profitless Prosperity.’”¹⁵

A similar verdict has been rendered by federal regulators. The FCC’s annual report on wireless phone services most recently offered the conclusion that the sector “continued to experience increased competition, innovation, lower prices for consumers, and increased diversity of service offerings. . . . [M]obile telephone operators continue to deploy their networks in an increasing number of markets, expand their digital networks, and develop innovative pricing plans.”¹⁶

The bullishness evinced in these analyses is based in the dynamic performance of the industry. As seen in Figure 1, the enormous capital investments wireless competitors have made in recent years have expanded the scale and scope of network services offered customers. In just the year 2002, total capital invested to create wireless service exceeded \$27 billion¹⁷—nearly \$200 per subscriber, and in excess of thirty percent of total industry revenues.¹⁸ Investments of such scale are required to construct national networks, which include the construction of thousands of base stations. See Table 2.

Wireless telephone competition has produced the copious benefits that the California Public Utility Commission predicted would flow if only federal regulators

¹⁴ Two cellular telephone licenses were issued in each local market between 1984 and 1989, each being allocated 25 MHz of radio spectrum. In 1995–1996, the FCC issued six PCS licenses in each market, three allocated 30 MHz [and] three allocated 10 MHz. In addition, specialized mobile radio (SMR) licenses have been authorized to provide wireless telephone service to the public, and licenses for these services are allocated approximately 10 MHz in each local market (depending on the market). In all, about 180 MHz are available for use by commercial mobile radio service (CMRS), with the bandwidth allotted to nine individual licenses. Licenses may be aggregated, subject to limitations under the “spectrum cap,” discussed below. The result is that six national wireless networks have emerged: Verizon, AT&T, Cingular, Sprint PCS, T-Mobile, and Nextel.

¹⁵ S. Flannery et al., *Wireline Telecom Services: 3Q02 Preview*, Morgan Stanley, Dean Witter (Oct. 16, 2002), 27.

¹⁶ Federal Communications Commission, *Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Radio Services, Seventh Report*, 5, 17 (July 3, 2002).

¹⁷ Mark Lowenstein, *The Wireless Industry: Vibrant and Competitive*, Mobile Ecosystems (August 2002).

¹⁸ Id.

would liberalize entry. With the issuance of personal communications services (PCS) and enhanced specialized mobile radio (ESMR) licenses, wireless markets now feature robust competitive rivalry notably absent during the period in which two cellular licensees dominated local markets. “The ultimate goal of the CPUC’s regulatory policies is to ensure that effective competition develops in the wireless market as quickly as possible,” wrote the CPUC in August 1994.¹⁹

FIGURE 1. CAPITAL EXPENDITURES BY U.S. WIRELESS OPERATORS, AGGREGATES AND AS PERCENT OF REVENUES, 1999–2004



Source: “The Wireless Industry: Vibrant and Competitive,” Mark Lowenstein, MOBILE ECOSYSTEMS, (Aug. 2002).

¹⁹ CPUC 1994b, 9.

TABLE 2. FIXED INVESTMENT BY MAJOR WIRELESS TELEPHONE CARRIERS			
<i>Carrier</i>	<i>Tangible Assets (\$million)</i>	<i>Base Stations</i>	<i>Subscribers (000s)</i>
AT&T Wireless	\$24,282	--	18,047
Cingular	--	--	21,596
Nextel	\$15,997	16,300	8,667
Sprint PCS	\$14,695	21,000	13,555
T-Mobile	--	--	6,993
Verizon	--	--	29,398

Sources: Subscriber data are EOY 2001, and from Federal Communications Commission, *Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Radio Services, Seventh Report*, FCC 02-179, (released July 3, 2002), C-9. AT&T Wireless information from company press releases. Sprint PCS information from company press releases. Sprint PCS U.S. base station information from 2001 10-K, 16. Nextel information from company press releases.

Today, that rivalry has emerged. As the CPUC argued, this competition critically impacts policy choices. The CPUC should carefully consider its current temptation to abandon its previous reliance on market forces in favor of regulatory intervention. In fact, the experience gained in the years following federal pre-emption of state rate regulation – a deregulation state regulators opposed, predicting a surge in rates – indicates that regulation did not protect consumers. Today, with competitive forces in wireless markets clearly enhanced, with wireless networks aggressively expanding into additional product spaces such as wireless local loops and data services, and the scope of regulatory purview much narrower (rate regulation is decidedly pre-empted), the case for regulation of wireless telephone service is much weaker than when the state – correctly, the evidence now reveals – lost its argument for authority to regulate cellular rates in 1994.

II. Market Failure

Arguments for regulation rest on market failure, which comes in two basic genres: market power or externalities. Either source can distort market mechanisms that, if free to operate, maximize consumer welfare. Market power involves monopolistic output restrictions, the result where insufficient competitive pressure allows firms to charge prices considerably in excess of costs, thereby transferring income from buyers and producing an inefficiently parsimonious level of service. Externalities occur when costs or benefits resulting from productive activity are not tied to the decisionmaker creating that activity and are therefore excluded (not “internalized”) from the economic calculations underlying demand or supply or both.

Market power. Market power is not a compelling rationale for wireless regulation by the CPUC. Not only does abundant evidence of robust competition exist, but federal responsibility for competitiveness is clear: the antitrust authorities at the U.S. Department of Justice and the telecommunications regulators at the FCC exercise oversight of entry and market structure. Indeed, the FCC maintained a so-called spectrum cap, rules limiting the number of wireless licenses an individual operator could acquire, so as to prevent undue market concentration. Under the 45 MHz spectrum cap instituted in 1993, operators were effectively prohibited from combining a broadband PCS license in the A, B, or C Block (allocated 30 MHz) with a cellular telephone license in the same local market (either of which is allocated 25 MHz). Given that approximately 180 MHz are allocated to wireless telephone service (including PCS, cellular, and the SMR frequencies used by such companies as Nextel), the rule has provided for at least four operators competing head-to-head in each service area. In practice, subscribers in major population centers have six competing national networks to choose from.

FCC regulators have determined wireless competition so effective that, in November of 2001, the 45 MHz limit was raised to 55 MHz. Since January 1, 2003, the cap in metropolitan market areas has been eliminated.²⁰

The ruling is important not only in informing the specifics of wireless market power, but in highlighting the key trade-off in regulatory intervention: rules to promote consumer interests have both costs and benefits. In this instance, some limits on concentration help to keep multiple suppliers bidding for a given customer's business. Yet excessive deconcentration or the wrong configuration of rules limiting aggregation imposes costs on consumers that outweigh benefits. Where larger bandwidth helps wireless operators to expand networks, create new services, capture economies of scale via standardization, or increase throughput speed for users, the spectrum cap is not free. Regulators must determine where the optimum lies.

The California Public Utility Commission has itself stated that “the CPUC agrees with the FCC’s view that where markets for commercial mobile radio service (“CMRS”) are effectively competitive, competition is ‘a strong protector of these interests.’”²¹ This conclusion suggests a corollary: that market failure due to excessive concentration is not a viable rationale for regulation.

Externalities. The possible regulatory issue in wireless telephone service relates to the public good nature of information. Individual customers typically operate with less than full information about the services they buy because, while information can be valuable, it is also costly to acquire. Sometimes, that cost is worth the investment to consumers as a group but inefficient for one customer. Without good coordination between customers, the market fails—information about preferred alternatives is valuable, but under-supplied.

²⁰ Federal Communications Commission, *In the Matter of 2000 Biennial Regulatory Review Spectrum Aggregation Limits for Commercial Mobile Radio Services*, Report and Order, FCC 01-328, (Nov. 8, 2001).

²¹ CPUC 1994b, 3.

This underpins the argument for government to, in effect, coordinate customer activity in information gathering. This can be achieved by regulations imposing various requirements on suppliers or transactions. The typical policy intervention is for the government to select a minimum standard and to prohibit sales of units (or services) below that standard. Yet the market may produce the desired level of customer coordination in other ways, and these alternatives may prove more beneficial to customer interests. Indeed, sophisticated arguments for the efficiency of competitive markets rest not on the assumption of perfect information, which is violated everywhere in the real world, but on the effectiveness of market mechanisms in supplying valuable information at reasonable cost.

In particular, wireless operators offer a mix of services with menus that are both heterogeneous at a point in time and evolving over time. This is reflected in the FCC's observation, above, that wireless operators are continually bringing innovative service packages to the marketplace. Suppliers engage in such product differentiation to attract customers; to do so, they must engage in educating potential purchasers about their products. This involves substantial investments in marketing, including advertising, sales offices, product demonstrations, and persuasive, easy-to-understand brochures, websites, and other graphic displays.

Perhaps the most fundamental aspect of this competition among operators to supply product information is that customers rarely have an interest in becoming expert in wireless technology, pricing structures, or network architecture. Their attention is limited; their patience even more so. Yet they have a strong economic incentive to find the service that best satisfies their demands at the lowest cost, as well as an intense desire to avoid options that fail to deliver as advertised. The observed outcome of this set of trade-offs is that customers tend to shop for packages by assessing price and quality in light of the reputations of the sellers offering various alternatives. Sellers invest in brand-name capital in attempts to establish customer relationships that meet expectations. The competition between name brands allows customers to gain valuable information about the alternatives they face in an economical way.

Consider the proposition: *Wireless operators should make absolutely full disclosure to customers when they purchase services by explaining all terms and conditions, by informing them of every alternative choice they could make (including those offered by competitors), and by providing detailed instructions as to how to use telephones.* Many would sympathize with the basic thrust of such a requirement, which seems to tackle problems regarding under-provision of product information. But such a mandate would be extremely hostile to consumer interests.

Customers have lives—or, as economists more pedantically say, opportunity costs. Most will not be eager to volunteer for “cell phone tutorials” lasting several hours, time that they value highly *elsewhere* in their busy day. Wireless networks (and equipment suppliers) do offer customers instructions, help lines, brochures, manuals, sales offices, sales personnel, repair service, and contracts spelling out terms and conditions. They also offer dispute resolution processes when disagreements arise, and these typically involve use of binding arbitration. (See the discussion below.) Every

wireless phone operator undertakes these efforts, in varying degree; to compete with the alternatives available to consumers, the market demands it.

But rival operators provide different mixes. They often institute national pricing plans but test unique marketing approaches within local markets. Operators focus on different elements of the price-quality package, with some offering better pricing and others higher quality network connections. These choices by sellers result in extremely complex results: millions of subscribers using wireless phones in countless locations with gradations of quality too subtle to quantify objectively, as they depend not just on signal strength at specific times and specific places, but on how users subjectively evaluate various performance characteristics.

Quality cannot be objectively measured, but customer perceptions—the economically relevant outcome — are tabulated in various ways. The February 2003 issue of CONSUMER REPORTS, for instance, surveyed about 22,000 wireless users to monitor various dimensions in which wireless operators might be compared. See Table 3. (Table 3A compares customers’ ratings of wireless services in San Francisco and Los Angeles.) Of course, such surveys are themselves but a snapshot of a never-ending horse race for market share. To jockey for position, firms are forced to provide customer information that is deemed interesting and helpful by consumers.

TABLE 3. CUSTOMER RATINGS OF WIRELESS OPERATORS —NATIONAL SURVEY OF 22,000 USERS BY *CONSUMER REPORTS* (FEB. 2003)

<i>Carrier</i>	<i>High</i>	<i>Average</i>	<i>Low</i>	<i>Comment by CONSUMER REPORTS</i>
Verizon Wireless	72	71	69	Consistently at the top of the ratings. One of the better companies for customer support. No noteworthy service problems.
AT&T Wireless	69	66	63	One of the better companies for customer support. Overloaded circuits in three cities; otherwise, middle-of-the-road performance.
Nextel	67	65	62	Availability of service an issue in New York and Los Angeles. Most billing problems. Low score for customer support.
T-Mobile	67	65	62	Connection problems in Chicago and New York. One of the better companies for customer support. Company formerly known as VoiceStream.
Cingular	67	61	54	The greatest variation in scores. Problems with overloaded circuits. Low score for customer support.
Sprint PCS	65	62	58	Worst customer support. Dropped calls an issue in five of six areas.

Scoring scale — 100: all respondents completely satisfied. 80: respondents very satisfied on average. 60: respondents fairly well satisfied on average.

Source: *Three Steps to Better Cellular*, CONSUMER REPORTS (FEB. 2003).

TABLE 3A. CUSTOMER RATINGS OF WIRELESS OPERATORS—
SAN FRANCISCO AND LOS ANGELES

*Overall Satisfaction covers all the factors related to costs, service, and problems.
5 = fewer problems; 1 = more problems.*

San Francisco					
<i>Carrier</i>	<i>Overall Satisfaction</i>	<i>No Service</i>	<i>Dropped Calls</i>	<i>Static</i>	<i>Circuits Full</i>
Verizon	70	5	3	3	5
AT&T	68	3	3	3	3
Sprint PCS	61	3	2	3	5
Cingular	54	1	3	3	4
Los Angeles					
<i>Carrier</i>	<i>Overall Satisfaction</i>	<i>No Service</i>	<i>Dropped Calls</i>	<i>Static</i>	<i>Circuits Full</i>
Verizon	69	3	3	3	4
AT&T	63	3	3	2	1
Sprint PCS	63	3	2	3	5
Nextel	62	1	3	3	1
Cingular	59	1	3	3	2

Scoring scale — 100: all respondents completely satisfied. 80: respondents very satisfied on average. 60: respondents fairly well satisfied on average.

Source: *Three Steps to Better Cellular*, CONSUMER REPORTS (Feb. 2003).

Most wireless customers evince modest demand for extensive technical or legal detail regarding service options. They want a store or service center to be conveniently located,²² basic service plan features and rates clearly displayed, and phones easy to operate. They rely on market competition—including rivalry for reputation—in gathering information before purchase. Of course, customers are adept at procuring much information that, while important to them, is literally unknown to others, including government regulators. By checking with friends, neighbors, or co-workers, they ascertain how well rival wireless systems work in the unique circumstances they expect to apply to their location and usage pattern.

And, by subscribing for a finite period of time, subscribers themselves sample alternatives and gain intimate market knowledge. If the median contract life is two years, at least 65 million buyers with *detailed product knowledge* are shopping in the market annually. These consumers possess specific information about coverage areas, signal quality, equipment functionality and ease of use, customer service, and billing practices that obtain to their particular circumstances. This information will, in the main, not be known to regulators. Having been a customer in precisely the place that they are likely to be a customer, they achieve some substantial element of expertise in evaluating a given operator's service. By trading knowledge with other local users, including subscribers to rival systems, consumers accumulate relevant knowledge. Absent market failure, forcing

²² Mobile phones can, of course, be purchased via 800 numbers or online.

suppliers to provide additional “information” or “services” is either wasteful (as in the printing of large documents that customers do not read) or significantly detrimental to consumer interests (as in the reduction of sales effort, and hence competitive rivalry, because of increased marketing costs).

To deliver services meeting the actual needs of real customers, U.S. wireless markets have developed a distinct structure. Handsets are not (easily) interoperable, so an investment in equipment must take place before a service agreement is undertaken. These investments are specific, tying consumers to particular service operators; if the given relationship sours, the capital is largely nonsalvageable (as a used handset is worth much less than a brand new one). Potentially, such a situation is problematic. A relatively simple set of institutions has been widely adopted to establish a mutually beneficial customer-seller relationship:

- * a contract fixing prices over a one- to three-year period
- * a free, or discounted, mobile phone for customers initiating service
- * a minimum term, often with early cancellation penalties

Wireless operators routinely buy customers the necessary equipment to make telephone calls or subsidize the price of handsets to enable subscribers to use their services. Operators commit to offer rates stated in advance. The operator gains market share by providing convenience and assurance, and stakes its reputation on performance. Where customers find that service exceeds expectations, the operator is likely to be more successful in retaining existing subscribers and in enlisting new ones.

Importantly, the market works without perfect information. Operators compete on margins relevant to customers: marketing campaigns communicate price and quality; consumers choose among rival options, interpreting results in the mass market. Reputations generate bonuses when consumer expectations are largely met, and penalties when they are not.

III. Regulatory Costs and Benefits

The CPUC is considering implementation of the following wireless regulations:

- *Signature requirements.* These rules would mandate that service be initiated, or changed, only via written contracts or consent recorded by “third party verification” or “oral capture.” While consent currently must be obtained for agreements to commence or be changed, the proposed rules have much broader verification and disclosure requirements, meaning that written or oral consent could be obtained only after an expanded explanation of terms and conditions. Since customers’ time is valuable, such requirements increase costs for buyers. Specifically, the cost of creating, or altering, a service agreement increases. The fact that most customers do not invest their time to acquire such information when it is available without charge suggests that these costs exceed their benefit. Imposition of such rules would change behavior by both buyers and sellers. Wireless operators would be expected to reduce the number of new service plans or promotional campaigns, given the higher costs of marketing and the reduced opportunity to gain new subscribers (who are less willing to absorb the increased time costs). Alternatively, customers would be less willing to investigate rival plans, which is now more time-consuming. Ironically, competition between operators would likely diminish due to an increase in switching costs.
- *Advertising disclosures.* Proposed rules would significantly increase the amount of technical information that would have to accompany sales and marketing announcements. This predictably changes the shape and magnitude of advertising campaigns. If the information provided is of little value to consumers, the rule effectively taxes ad time; when a minute is purchased, only a fraction of a minute conveys information helping attract customers. This tax effect is reinforced by the incremental costs associated with advertising in California markets, where national commercials may not conform. Marketing efforts for California wireless customers will likely contract, again diminishing rivalry among firms.
- *Extending Free Termination Periods.* These rules would extend the period during which a new customer may cancel a contract and yet avoid early termination fees. Such charges compensate carriers for the cost of customer switching (“churn”) and yield assurances that subscriptions last at least as long as the period to which the fee applies. That, in turn, yields incentives for operators to make investments – such as awarding “free” mobile telephones to subscribers – to attract such customers. Regulation could extend “trial” periods indefinitely by prohibiting all early termination fees. That would be a perverse way to advance consumer interests, as it would simply end customer-specific investments. Indeed, customers already have the opportunity to choose service plans with shorter contract periods, or no contract at all (for example, in the case of

pre-paid service). Of course, carriers are unwilling to subsidize telephone purchases in the absence of contracts, and so terms (including phone units and the cost of minutes) are typically less advantageous.

Even advocates of regulation have recognized that categorical rules can sabotage consumer interests. For instance, the CPUC's June 2002 proposal included a mandate that wireless customer agreements explicitly spell out all terms and conditions. A coalition of consumer activists objected, arguing that only "important terms" needed full explanation. Otherwise the result would be "contracts that are even less consumer friendly and weighted down by arguably minor information."²³ Similarly, the consumer groups recognized that "[c]ompulsory translation of all contracts, bills and all notices could have the perverse result of causing carriers to stop marketing to linguistic minorities."²⁴ In short, costs matter to consumers.

Gathering proprietary data from the five largest California wireless telephone networks, the Law and Economics Consulting Group (LECG) has recently estimated the costs that are likely associated with compliance of the rules being considered in the Telecommunications Consumer Bill of Rights as modified by the consumer groups. These costs are substantial: aggregate implementation expenditures are estimated to be about \$5.74 per subscriber per month.²⁵ LECG, using marginal cost of taxation estimates supplied by Jerry Hausman,²⁶ notes that additional efficiency losses (due to economic distortions resulting from such regulations) are \$4.19 to \$6.63 per subscriber per month. This implies that the costs imposed by regulation amount to upwards of about \$11 per subscriber per month.²⁷ Given that wireless telephone ARPU (average revenue per customer) per month, nationally, was about \$53.76 in 2002,²⁸ the rules impose costs equivalent to approximately twenty percent of revenues.

Large benefits would be necessary to offset such substantial costs. To understand how such benefits might materialize, we must observe the operation of the existing marketplace. Without such rules in place, how do customers exercise their rights to select services that best meet their demands? What are the complaints registered by wireless subscribers in dealing with wireless operators? These questions are addressed by examining competitive conditions in the wireless telephone sector, to which we now turn.

²³ Consumers' Proposed Changes to Telecommunications Bill of Rights Rules, California Public Utilities Commission Rulemaking 00-02-004 (October 21, 2002), Rule 1(h) Discussion.

²⁴ Consumers' Proposed Changes to Telecommunications Bill of Rights Rules, California Public Utilities Commission Rulemaking 00-02-004 (October 21, 2002), Rule 2(c) Discussion.

²⁵ Debra Aron, *The Financial and Public Policy Implications of Key Proposed Telecommunications Consumer Protection Rules on California Wireless Carriers and Customers: Economic Analysis*, Law & Economics Consulting Group (Feb. 2003), 1.

²⁶ Jerry Hausman, *Efficiency Effects on the U.S. Economy from Wireless Taxation*, revised February 23, 2000, <http://econ-www.mit.edu/faculty/jhausman/files/Wireless.pdf>, (viewed Jan. 26, 2003).

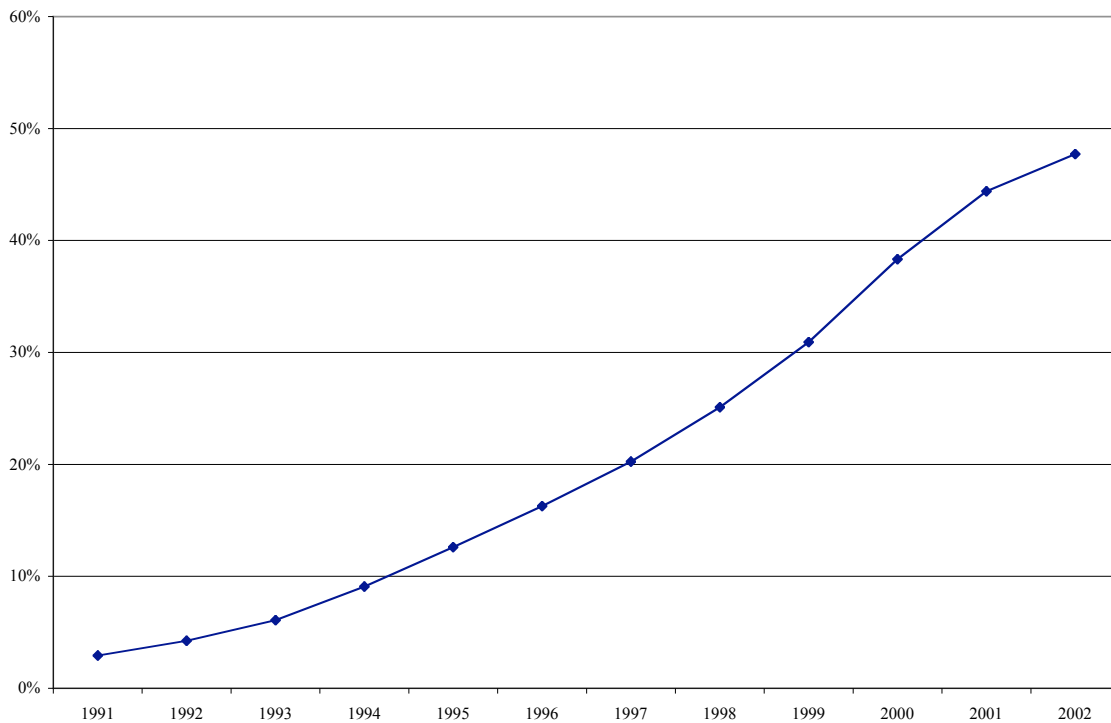
²⁷ Aron, 1.

²⁸ Luiz Carvalho, Steve Amaro, and Vance Edelson, *Wireless Telecom Services*, Morgan Stanley Equity Research (March 4, 2003), 7.

IV. Wireless Telephone Competition in California and the United States

The FCC finds that intense competition in the mobile phone market has led to “increased output, lower prices, and increased diversity of service offerings.”²⁹ In 1994 just two wireless telephone licenses were available per market, and the duopoly market structure produced a mobile phone penetration under 10 percent. Starting in 1995, up to six additional licenses were issued in each market. By 2002, over 49 percent of the population had a mobile phone. See Figure 2.

FIGURE 2. U.S. WIRELESS TELEPHONE PENETRATION RATE
SUBSCRIBERS/POPULATION, 1991- 2002

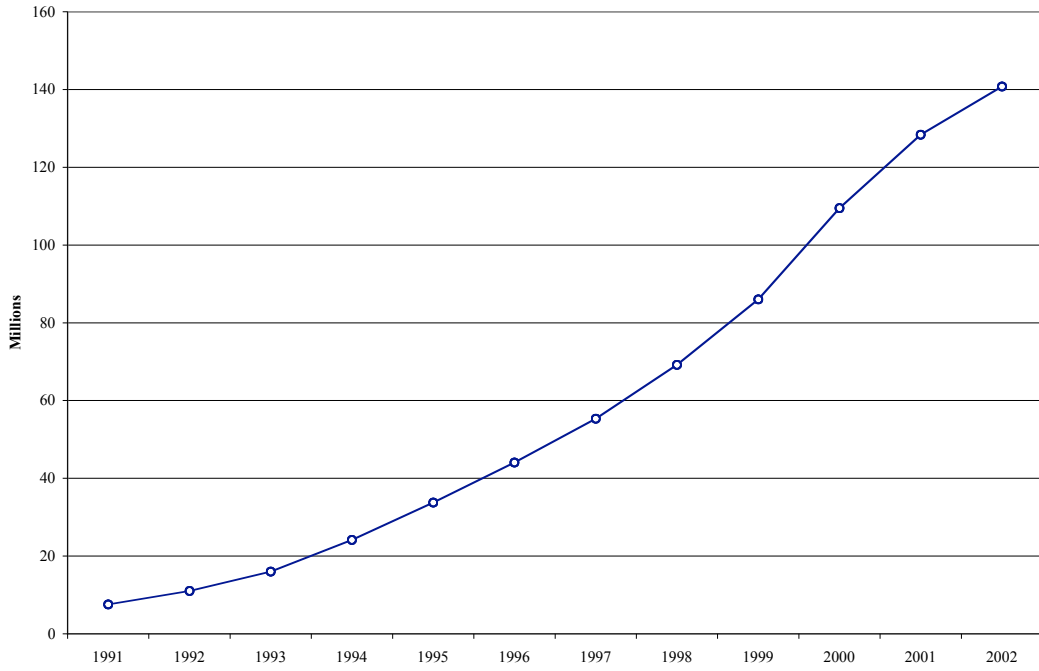


Source: Table 1.

Following deregulation and new competitive entry, the number of mobile phone subscribers increased markedly, as did the minutes of use per subscriber. See Figures 2-5. These trends drove aggregate wireless minutes up nearly 5,500% percent. See Table 1. This increase in output was the product of intensified rivalry on many margins, including price, where the per-minute cost of mobile phone service declined over 75 percent.

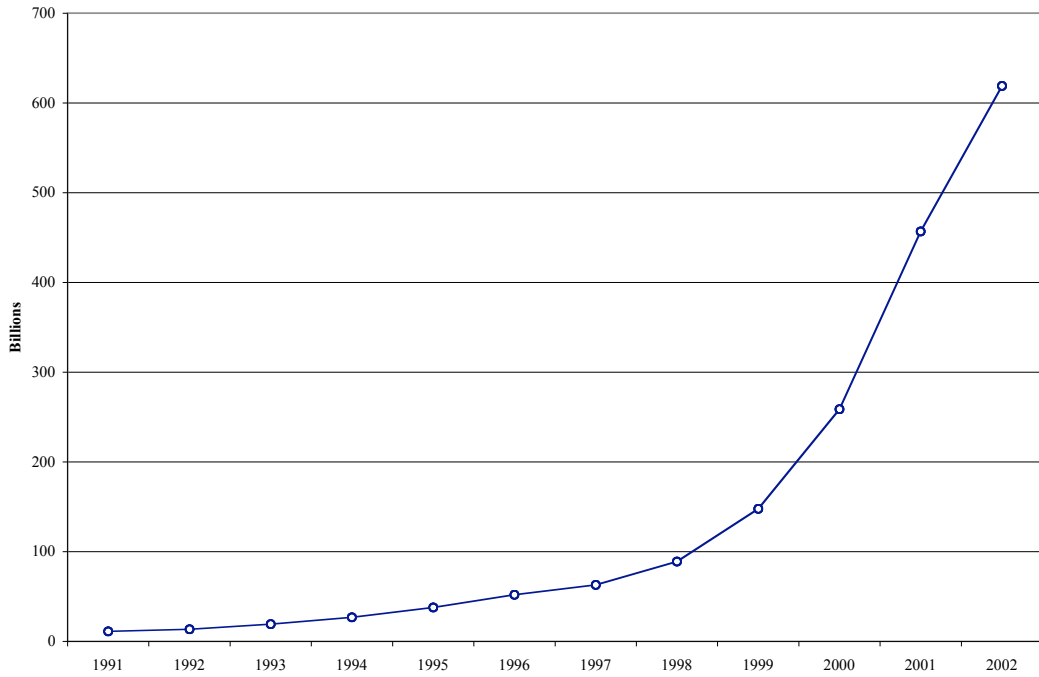
²⁹ Federal Communications Commission, *In the Matter of 2000 Biennial Regulatory Review Spectrum Aggregation Limits for Commercial Mobile Radio Services*, Report and Order, FCC 01-328, (Nov. 8, 2001), para. 35.

FIGURE 3. U.S. WIRELESS TELEPHONE SUBSCRIBERS, 1991–2002



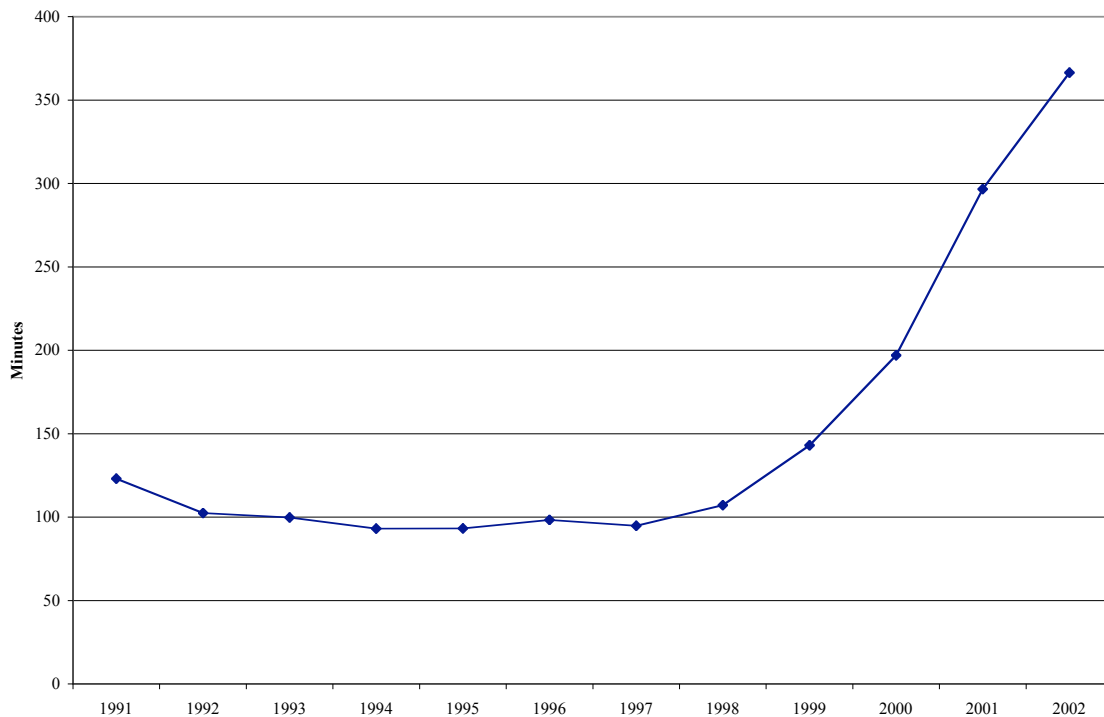
Source: Table 1.

FIGURE 4. AGGREGATE U.S. MINUTES OF USE, 1991-2002



Source: Table 1.

FIGURE 5. AVERAGE MONTHLY MINUTES OF USE, 1991–2002



Source: Table 1.

U.S. wireless deployment is even more impressive when one considers that basic local telephone service in the United States is provided not only universally (with household subscriber penetration above 90 percent), but at relatively low usage fees. Residential rates are effectively cross-subsidized and are unmetered, distinct from the practice in many other countries.

The FCC believes that market competition drives a diversity of service offerings:

[M]obile telephony service providers are offering new and innovative pricing plans. Most of the major carriers offer nationwide flat-rate, digital pricing plans, and several large carriers now offer regional flat-rate, digital pricing plans as well. Further, several carriers provide international roaming services to their customers. Mobile telephony providers are also offering technologically innovative services including Short Messaging Service (“SMS”), email, and web-based applications. In addition, “churn . . . and continued expansion of mobile networks into new and existing markets demonstrate a high level of competition for mobile telephony customers.”³⁰

³⁰ Federal Communications Commission, *In the Matter of 2000 Biennial Regulatory Review Spectrum Aggregation Limits for Commercial Mobile Radio Services*, Report and Order, FCC 01-328, (Nov. 8, 2001), para. 35 (references omitted).

Key to the perceived success of the wireless communications marketplace is quality competition. This process requires flexibility in service offerings rather than uniformity, because it is by trial and error that useful innovations are discovered. Further, by allowing heterogeneous approaches to quality, firms have incentives to pioneer advances garnering additional subscribers. The demonstration process prompts imitation, leading to rapid adoption of successful models. The FCC asserts:

The continued rollout of differentiated pricing plans indicates a competitive marketplace. In the mobile telephone sector, a single operator often tries a new and innovative pricing plan, and is later imitated by competitors if the plan proves to be successful. For example, many in the industry questioned AT&T Wireless's wisdom when it introduced the first Digital One Rate ("DOR") plan in May 1998. Today all of the nationwide operators offer a similar type of DOR pricing plan that allows customers to purchase a bucket of MOUs on a nationwide or nearly nationwide network without incurring roaming or long distance charges.³¹

The heterogeneous product mix is illustrated in the example of prepaid services. Prepaid customers purchase a fixed amount of minutes before they use their phones, which they purchase, periodically refilling it with additional minutes, before they are used. Prepaid customers typically have lower revenues and higher churn compared with postpaid customers.³² They also tend to get less favorable per-minute prices than postpaid customers. "[P]ostpaid plan rates are lower, the phone selection is greater, and the promotions are better than those available to prepaid subscribers,"³³ who account for 8 to 10 percent of subscribers.³⁴

Competitors are targeting this segment with innovative offers, however. For example, Sprint PCS's "Clear Pay" plan limits billing charges a customer can accumulate or requires a deposit, or both.³⁵ That allows Sprint PCS to serve much of the prepaid market niche with rates and service packages comparable to those found in postpaid. Many customers who value flexibility and object to early termination fees would logically migrate to such plans.

V. The Complexity of Wireless Telephone Service

"Price really has no meaning except in terms of an assumed quality of service; price is a ratio, with money in the numerator and some physical

³¹ Federal Communications Commission, *In the Matter of Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions with Respect to Commercial Mobile Services, Seventh Report*, (June 13, 2002), 29.

³² *Id.*, 30.

³³ *Id.*, 31.

³⁴ *Id.*, 30.

³⁵ *Id.*, 31.

unit of given or assumed quantity in the denominator. Price regulation alone is meaningless.”

—Alfred E. Kahn³⁶

In one sense, the observation that firms experiment with distinct rate plans and then scurry to converge on popular offerings is misleading. Any analysis that focuses solely on price competition misses a very substantial part of the picture. Regulating the terms of service, or the disclosure of the terms of service, inevitably confronts the perennial challenge of rate regulation: quality is elastic. Suppliers and consumers respond to rules in complex ways. In wireless telephony, technologies are complicated and dynamic. Rules that require higher costs for marketing will inevitably lead firms to adjust their investments in network quality, handset functionality, and other margins on which service may be upgraded – for a price. When marketing costs rise, the returns available from selling new services generally decline.

No level of disclosure regulation will result in full information for potential customers. This is implicitly conceded even in the Telecommunications Consumer Bill of Rights proposed by consumer groups, which excludes explanation of certain conditions with the simple caveat: “additional terms may apply.” Economist Debra Aron notes the reality driving this abbreviation: “The inclusion of this phrase demonstrates the futility of prescribing a static list of terms that must be separately approved by each individual customer via oral capture or TPV [third party verification].”³⁷ Categorical “full disclosure” requirements are simply not cost-effective. Compromises are inevitable, and the efficiency question is one of where to draw the line.

The approach advanced in the CPUC’s regulatory proposal is that regulators can draw lines closer to the optimum than can competitive markets. Mandated standards depend on the ability of regulators to explicitly design structures to elevate the level of useful information for customers without imposing counter-productive costs or incentives (on subscribers or operators). This is a tall order in any industry, and is steeper still in wireless telephony. Here, operators already face intense pressure to shape offerings so as to gain a favorable reputation for service. Efforts to improve the market’s mix of service contracts and marketing practices must out-perform this constantly changing pattern of innovation. Moreover, the nature of the wireless telephone services being purchased are extremely complicated to evaluate given the heterogeneous use made of networks with respect to both geography and functionality.

Even in a more stationary context, economist Thomas Sowell finds that explicit regulatory structures have difficulty improving competitive market outcomes:

The definition or articulation of product characteristics by third parties seldom covers as many dimensions as are unconsciously coordinated by unarticulated market processes, so that (for example) an apartment typically has more auxiliary services when there is less articulation (in

³⁶ Alfred E. Kahn, *THE ECONOMICS OF REGULATION* (Cambridge: MIT Press, 1988).

³⁷ Aron, *op cit.*, 22.

private housing markets) than when there are more elaborate articulations (in public housing regulations).³⁸

Consider the range of variables implicit in the bargain a wireless telephone operator strikes with a customer. While prices and services may be summarized in fairly simple ways, actual usage (and the value conferred) depends on the underlying network and the utility it yields as the individual customer uses it. A sample of the factors critical to determining how the wireless services purchased serve a given consumer includes:

* **Technology selections.** Operators choose among wireless standards such as CDMA, TDMA, GSM, and iMode, and make countless decisions over such technical dimensions as channelization and power usage. Trade-offs are ubiquitous. Deploying a popular system used around the world (like GSM) gives operators and customers cheaper equipment because of global economies of scale, yet deployment of newer, more spectrally efficient technology (like CDMA) can make the transition to advanced data services easier and cheaper.³⁹ More power used by the handset means better reception (increasing demand) and/or fewer base stations (lowering costs), but shortens handset battery life. Selecting operating systems for compatible wireless devices, such as personal digital assistants (PDAs like Palm or Blackberry) also involve delicate power/functionality trade-offs; typically, the more complex the OS, the more applications it can run but the more power it consumes. Similarly, allocating more bandwidth per channel increases the quality of calls (increases demand), but results in tighter system capacity constraints and increases the likelihood of blocked access or dropped calls during rush hour (lowering demand).

* **Investment in base stations.** More base stations improve capacity (fewer blocked calls) and can allow lower handset power (increasing battery life), but they raise costs.

* **Increasing functionality.** Add-on services can be a boon to consumers who demand paging, instant messaging, wireless web applications or “one touch” walkie-talkie service.⁴⁰ But such innovations are costly to implement, soak up bandwidth,

³⁸ Thomas Sowell, *KNOWLEDGE AND DECISIONS* (Basic Books, 1980), 335.

³⁹ Thomas W. Hazlett, *Saved from Common Standards*, *FINANCIAL TIMES* (Web ed., Nov. 27, 2002), www.ft.com/techforum.

⁴⁰ One of the hottest competitive margins in wireless telephony is the race by other carriers to match the popular “one touch” function of Nextel phones. The feature allows subscribers to effectively utilize a private wireless network with office workers or family members without dialing a seven- or ten-digit telephone number. “A shoving match between wireless giants has erupted over a cell phone technology called “push to talk”.... Developed by Motorola, the technology turns cell phones into walkie-talkies by connecting to other phones without dialing and within just a few seconds. The cell phone network gear used for the feature has now been replicated by Ericsson... Another telephone equipment maker, Samsung Telecommunications America, said Monday that it has hired Togabi, a wireless software maker, to develop a push-to-talk feature its calling PacketChat. Samsung has not said when this will become available. There's also a battle brewing among Nextel Communications—the only U.S. carrier now offering the service—Verizon Wireless and Sprint PCS... One of the key benefits of the push-to-talk feature is a shorter-than-normal cell phone call, which cuts down on dialing costs. Nextel Communications has made billions of dollars selling the service to construction companies, trucking firms and others who once used walkie-talkie-like devices to instantly connect to others.” Ben Charny, *Push comes to shove for 'push to talk'*, *CNET News.com* (March 17, 2003), <http://news.com.com/2100-1039-992976.html>.

require specialized handsets (raising costs generally by truncating economies of scale), and raise network complexity (increasing operating costs). In particular, coming 2.5G or 3G data services are increasing rapidly.⁴¹ To offer 700 kbps broadband speeds (with maximum bursts to 2.4 Mbps),⁴² Qualcomm's new CDMA2000 1X EV-DO uses 1.25 MHz channels that exclude voice calls,⁴³ for instance. The new technology increases capacity on voice channels as well as on data links, but at any given moment capacity trade-offs obtain.

It is possible to compare and contrast rival offerings. See Table 4. Wireless telephony is clearly a service business, and the service is not commoditized. While strong competitive pressures exist, firms choose varied paths in order to meet them. Technologies, functionalities, service bundles and pricing options are therefore diverse. Perhaps most important to customers, however, are those things that are not listed – and which cannot be listed – in the chart: the actual quality of service offered the end user. Either the information required is too specific (what are average data speeds for T-Mobile or Nextel customers in your neighborhood at the times you typically access the web for the websites you typically access?) or the data too subjective (rating a clear but occasionally disconnected voice signal against a scratchy but more reliable connection) to allow “disclosure.” Instead of “articulated” or explicit product information, alternative mechanisms are used both by the purchaser and the supplier, who jointly rely on a host of institutions to raise the probability that they will strike mutually satisfying bargains.

⁴¹ “With mMode, we are seeing customers walk into the store and over 30 percent are signing up for data,” says Liz Schimel, vice president of business development at AT&T Wireless.” Sue Marek, *Execs Say Data Use is Proliferating*, WIRELESS WEEK (March 17, 2003), 1.

⁴² Brad Smith, *It Might be Cloudy Outside, But Sun Shines on WDU*, WIRELESS WEEK (March 17, 2003), 10.

⁴³ Qualcomm brochure, *CDMA2000 1xEV-Do Enhancements*, CTIA Convention, New Orleans, Louisiana (March 17-19, 2003).

TABLE 4. COMPARING MAJOR WIRELESS TELEPHONE CARRIERS IN CALIFORNIA

<i>Carrier</i>	<i>Technologies Offered</i>	<i>Handset Makers</i>	<i>PDA's</i>	<i>Average Data Speed</i>	<i>Roam in Europe?</i>	<i>Push to talk?</i>
AT&T Wireless	GSM TDMA	Nokia Siemens Ericsson Motorola	Blackberry Palm	86 kbps ^a	Yes ^b	No
Cingular	TDMA	Motorola Nokia Ericsson	Blackberry Handspring	86 kbps ^a	No	No
Nextel	Imode GSM	Motorola	Blackberry	96 kbps	Yes	Yes
Sprint PCS	CDMA	Hitachi Kyocera LG Nokia Sanyo Samsung Toshiba	Palm Pocket PC	50-70 kbps	No	Yes ^c
T-Mobile	GSM	Samsung Nokia Siemens Ericsson Motorola	Blackberry Palm Pocket PC Sidekick	40 kbps	Yes	No
Verizon	CDMA	Kyocera Samsung Ericsson Motorola Audiovox LG	Palm Pocket PC	50-70 kbps	No	Yes ^c

Notes:

^a Average speed of data estimated as 75% of max speed.

^b Can purchase a WorldConnect card to use with an international GSM wireless phone.

^c By year-end 2003 (Ben Charny, *Sprint, Verizon race on 'push to talk,'* CNET News.com (Feb. 14, 2003).

Sources:

<http://attws.com/>

<http://www.cingular.com>

<http://nextelonline.nextel.com/index.shtml?redirect=y>

<http://www1.sprintpcs.com/>

<http://www.t-mobile.com/company/>

<http://www.verizonwireless.com>

VI. Market Mechanisms for Quality Assurance

Because information is useful in forming an effective economic choice, consumers seek, and suppliers offer, information about how a product is likely to perform. Some of this information will be a technical summary of the characteristics of the product—its size, power, functionality, and so forth. This may include information relating to the design and manufacturing techniques, or processes and methods used, to supply a good or service. But much critical information will not be formally defined. Efficient mechanisms for communicating quality convey essential pre-purchase data to customers with a minimum of overhead.

Rarely (if ever) does a consumer fully understand a good or service before purchase. Yet competitive forces drive suppliers to offer assurance and thus yield customers opportunities to make intelligent choices without investing large sums in what economists call “search costs.” In many cases, advertising efficiently supplies information that makes consumers aware of product alternatives. As a result of the increased competition, consumers pay less.⁴⁴ Regulations that raise the cost of advertising are likely to make information more costly and so reduce competitive benefits.

Advertising also serves as a quality enforcement mechanism.⁴⁵ Firms that sink valuable capital to inform customers about their products broadcast valuable information even when messages do not transmit any price or (technical) product facts. Ads can serve as a *substitute* for information because advertising changes suppliers’ incentives to meet customers’ expectations. The investment in advertising is product-specific and nonsalvageable; if a supplier expends funds to generate demand for a given product, the cost of cheating customers (with quality that surprises purchasers on the down side) rises. In essence, advertising expenditures act as performance bonds. Firms that advertise have an added financial incentive not to disappoint buyers. Other specific investments made to establish a customer-supplier relationship – such as “free” telephones that will be heavily depreciated at contract expiration – provide similar assurance.

The substantial sums wireless firms invest in advertising their services and in providing networks have reinforcing effects: they establish a long-term commitment to the market. Only by enlisting an increasing number of subscribers can the sums expended be profitably recouped. And only by providing an experience that tends to impress consumers will an increasing subscriber base be achieved, as competitive networks stand ready to provide alternatives to the disgruntled customer.

Regulators may receive complaints from customers who object to early termination fees when attempting (during a contract period) to switch service providers. Disagreements tend to arise in any large set of transactions, and customers or operators

⁴⁴ See Jean Tirole, *THE THEORY OF INDUSTRIAL ORGANIZATION* (Cambridge: MIT Press, 1988), 289–90; Lee Benham, *The Effects of Advertising on the Price of Eyeglasses*, *JOURNAL OF LAW AND ECONOMICS* 15 (1972): 337–52.

⁴⁵ Benjamin Klein and Keith B. Leffler, *The Role of Market Forces in Assuring Contractual Performance*, *JOURNAL OF POLITICAL ECONOMY* 89 (1981): 615–41.

will make some mistakes. The question for public policy, however, is not how to pursue a perfect, zero-disagreement world, but how to maximize aggregate consumer welfare. That involves examining the benefits of regulation against the benefits provided by alternative (unregulated) mechanisms and then weighing any incremental benefits from regulation—if positive—against the costs that such rules will impose.

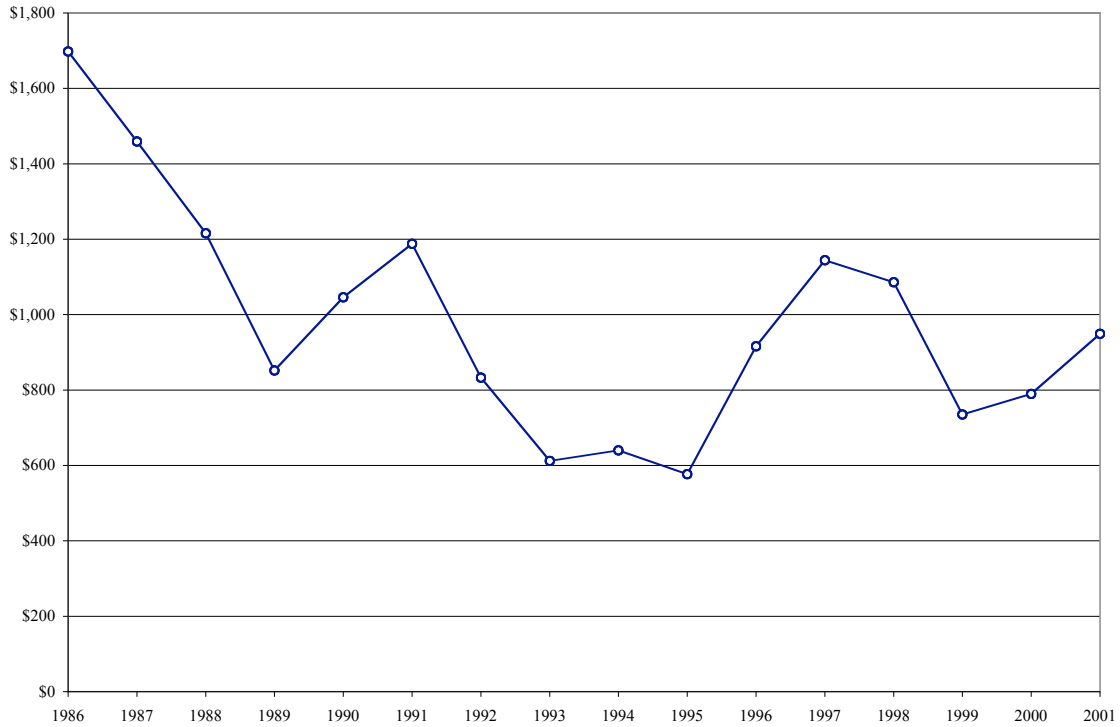
It is not clear that public dispute-resolution mechanisms that go beyond those currently available (to adjudicate claims in a court of law) improve the position of consumers. Firms have strong incentives to resolve disagreements, and every major wireless carrier in California has rules in place that allow its subscribers to settle conflicts via binding arbitration. (See discussion below.) A business strategy that relied on regularly surprising customers with less quality, or higher prices, than anticipated would put its fixed, long-term assets at risk. These networks are only valuable to the extent that they attract millions of subscribers, and the subscribers themselves are only profitable if they remain loyal. If a network gains a reputation for disappointing customers, penalties for early termination will not salvage the investment, which has an economic life far longer than the relatively short (one- to two-year) terms contracted for in wireless.

One revealing metric suggests how market competition generates quality improvements. Quality of service is extremely difficult to define, but one quantifiable measure positively correlated with quality is “channels per subscriber.” When more channels are available, customers experience network congestion (blocked or dropped calls) less often, all else equal. That is an unregulated aspect of quality, and most consumers have little idea that the statistic exists. All they understand is that a company that offers wireless service with lots of blocked (or dropped) calls is not as good as a carrier offering similarly priced plans with more reliable service.

Faced with this pressure, companies have continued to invest billions of dollars—nearly \$1,000 per new subscriber, as seen in Figure 6—to add base stations and advanced technology to improve service. The result, as seen in Figure 7, is that capacity per subscriber nearly tripled, even as the number of subscribers increased 200 percent, from 1998 through 2001. This quality improvement was not part of a customer guarantee, was not “disclosed” to every new subscriber, and was not regulated. It was expensive, and was imposed on operators by competitive market forces. And these investments are promoted, if not via the boilerplate of regulatory mandates—“can you hear me now?”⁴⁶

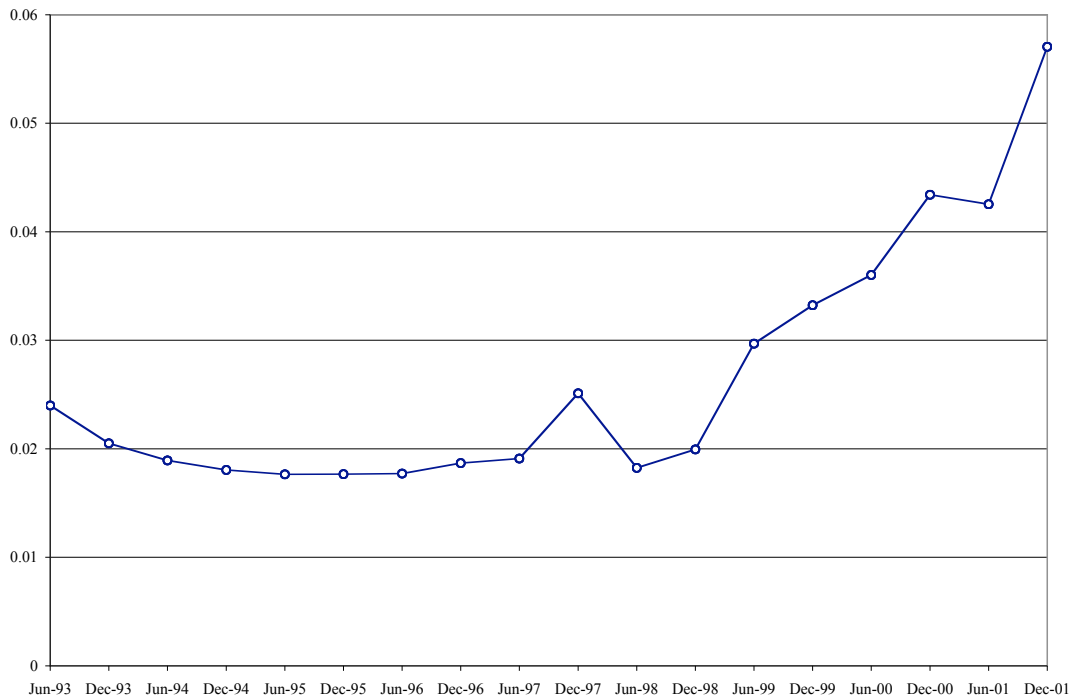
⁴⁶ The refrain in a currently popular, and seemingly ubiquitous, television advertisement for Verizon Wireless. The company portrays a network engineer testing phone connections as a way to communicate its investment in network coverage. Sprint PCS similarly promotes its all-digital wireless network with television ads that underscore the signal quality of digital transmissions.

FIGURE 6. INCREMENTAL CAPITAL INVESTED PER NEW SUBSCRIBER, 1986–2001



Source: Cellular Telecommunications & Internet Association, WIRELESS INDUSTRY INDICES SEMI-ANNUAL DATA SURVEY RESULTS (Aug. 2002).

FIGURE 7. CHANNELS PER SUBSCRIBER, 1993 – 2001



VII. The Economics of Free Handsets

The competition to sign up customers has led to a standard arrangement, outlined above, in which wireless phone operators provide customers with free (or sharply discounted) telephones in exchange for one- or two-year service agreements.

Simple financial calculus for a wireless operator shows that such marketing arrangements produce little or no profit absent a satisfied customer, one who is highly likely to renew his or her subscription at contract termination. Customers may choose to enter such contracts in exchange for better terms or free telephones, but firms with considerable sunk capital at risk are constrained to perform so as to establish sufficient brand name capital to amortize the long-lived investments they have sunk.

Customer acquisition costs, including handset subsidies, are reported to account for about \$340.⁴⁷ In 2002, nationwide average revenue per minute was twelve cents, and the average customer “consumed” some 366 minutes per month. See Table 1. At these prices, it takes 8 months for revenues to equal customer acquisition costs. Of course, this abstracts from operating costs (in 2002, the three publicly listed wireless networks reported operating costs exceeding 82¢ for every \$1 of revenue⁴⁸), and the investment to create the network itself.

Acquiring a customer can only be profitable if it builds a subscriber base, a base that must extend far beyond the 12 or 24 months of the contract. Operators extend generous terms to initiate such relationships, betting they can convince many customers to renew their subscriptions, that their experience will help enlist yet other customers, that customers will be enticed to purchase additional services, and that future economies can be executed to lower the cost of service delivery. Currently, industry churn rates average about 2.5 percent per month, which means that the typical customer relationship lasts only about forty months. See Table 5. Investors are well aware that lowering churn is crucial to their long-term economic success.

⁴⁷ Michael Rollins, Thomas Vincent, and Michael Nelson, *Wireless Services*, SALOMONSMITHBARNEY Industry Note (Dec. 10, 2002), 3.

⁴⁸ AT&T Wireless reported trailing twelve-month revenues of \$15.6 billion and earnings before interest, taxes, depreciation, and amortization of \$2.49 billion. Sprint PCS reported \$12.1 billion and \$2.74 billion; Nextel reported \$8.46 billion and \$1.18 billion. Yahoo!Finance (visited Feb. 20, 2003).

TABLE 5. DATA FOR U.S. WIRELESS CARRIERS						
	<i>Verizon</i>	<i>Cingular Wireless</i>	<i>AT&T Wireless Services Inc.</i>	<i>Sprint PCS</i>	<i>Nextel Communications Inc.</i>	<i>T-Mobile USA Inc.</i>
Subscribers	32.5 million	21.9 million	20.9 million	14.8 million	10.6 million	9.9 million
Net Additions	3.1 million	360,000	2 million	1.2 million	1.96 million	2.9 million
Technology Used	CDMA, AMPS	TDMA, GSM, AMPS	TDMA, GSM, AMPS	CDMA	iDEN	GSM
Spectrum Bands	850, 1900 MHz	850, 1900 MHz	850, 1900 MHz	1900 MHz	700, 800, 900 MHz	1900 MHz
Revenue	\$19.3 billion	\$14.7 billion	\$15.6 billion	\$12.1 billion	\$8.7 billion	\$4.9 billion (est.)
Net Income	\$3.6 billion (Oper. Income)	\$2.5 billion (Oper. Income)	-\$2.3 billion	-\$592 million	\$1.7 billion	N/A
Average Monthly Churn	2.3%	2.8%	2.6%	3.3%	2.1%	4.3% (Q3)
Revenue per User	\$48.06 (Q3)	\$48.33	\$60.2	\$61.8	\$71.0	\$48.46 (Q3)
Cost per Gross Add	\$375 (Q3)	\$350 (Q3)	\$377	\$353	\$450	\$308 (Q3)
POPs Covered	226.8 million (Q3)	198 million (Q3)	213 million	198 million	195 million	192.3 million (Q3)

Source: *By the Numbers*, RCR WIRELESS NEWS, March 3, 2003, 8.

This reality drives competitive behavior on countless margins, disciplining operators to promote customer satisfaction. Industry analysts and the trade press closely monitor their quest. The results of one recent survey were reported as follows: “The Telephia survey found that consumers who reported they were not highly satisfied with the process of signing up for a new rate plan were four times more likely to switch from their service provider than those who were highly satisfied.”⁴⁹

The importance of repeat sales impacts the nature of competition and the process wherein customers gain valuable product information. When initially choosing a carrier,

⁴⁹ Dan Meyer, *Retail Experience Weighs (Too?) Heavy in 3G Success*, RCR WIRELESS NEWS (Jan. 27, 2003), 8.

the customer typically relies not on technical service metrics, but on standard search techniques and market quality assurances. A company offering a free telephone and a reasonable trial period to test the service in the areas where usage is most likely, reduces the subscriber's risk in signing a contract. Brand reputations among area users are likely to exert some influence in this choice, as are the rate plans offered and the functionality of the phone provided (talk time, data enabled, size of phone, illumination of panel, etc.).

The customer then trades month-to-month flexibility for a set of benefits. The alternative is to take a higher-priced alternative, available via prepaid phone service. That only about ten percent of U.S. wireless phone users select this non-contract approach (most of whom have difficulty using post-paid services due to credit problems) is evidence that the gains of contracting exceed the costs for most consumers. When the contract expires, moreover, the consumer is now transformed into a sophisticated buyer who possesses highly specific knowledge regarding the quality of the services offered by the previously chosen carrier. Only if that knowledge increases the likelihood of another sale can the operator profitably compete. In essence, the operator invests in the initial contract period in order to advertise the value its network delivers.

TABLE 6. BENEFITS FROM THE CUSTOMER-CARRIER CONTRACT

<i>Customer Gets:</i>	<i>Carrier Gets:</i>
Fixed price for up to 3 years	Customer for a fixed period of time
Free or discounted phone	Head start with customer on renewal
Trial period (14 to 30 days) ^a	Credit check, limiting bad debt expense
Binding arbitration for disputes	Binding arbitration for disputes

^a <http://www.wow-com.com/PDF/CPUCbackground.pdf>.

VIII. Customer Information as if Customers Mattered

Technical details about wireless telephone systems are available in various formats, but users rarely invest the time to inquire about them. The standard concern is much more practical, and operators strive to differentiate themselves by providing the preferred solutions:

Some carriers have gone out of their way to make customers feel more comfortable with their devices and services. Cingular Wireless L.L.C. announced plans in mid-2001 to begin installing what it called “live bars” in some of its company-owned stores that allow customers to use a variety of devices and services before they buy them. These hands-on approaches contrast with older selling methods of having dummy handsets on display and information sheets describing different service offerings.

Analysts have applauded these efforts. . . . Analysts have also said simple data rate plans can go a long way to improving customer adoption of wireless data services. They note customers are more willing to try data services if they can understand how they are charged for them.

Sprint PCS helped its data sales efforts late last year when it introduced simple rate plans for its Vision service, providing unlimited data transmission for \$10 per month. The carrier also provided unlimited night and weekend voice calling on its nationwide Free & Clear plans.

“The general responses from the sales representatives implied an improvement in customer understanding of the service plans and, in turn, an increase in subscriber growth,” UBS Warburg said in a report.⁵⁰

Again, firms are forced to proffer such solutions subject to the constraint of customer demand—if consumers do not respond, the effort will fail to produce profits. Drawing up a list of things phone users should know, a detailed set of instructions, or an exhaustive description of available rate plans may be of little value to users and, hence, to the operator. What does matter to customers is best discovered by trial and error in the competitive process, as firms continually learn the hard way:

Little Chute, Wis.–based Airadigm Communications, which operates as Einstein PCS, has tried several different ways to get customers interested in non-voice services but has found little reception to its efforts. “We used to run monthly customer clinics designed to teach customers how to use the different functions on their handsets, but we found little attendance for them,” said Jean Van Den Brandt, marketing director for Airadigm Communications. “We ended up seeing the same people every week, who seemed more interested in the free refreshments we were offering.”⁵¹

If it were straightforward to devise a standard format that provided customers the information they valued when making a purchase, competitive firms would reliably find that solution. But purchasers typically do not shop for “complete” data. They want quick answers to key questions and are happy to economize on their search costs by letting brand-name reputation supply much of the quality assurance. This is why retail connections, either with sales personnel in stores, or easy-to-use web sites, have been found to be crucial to marketing success:

”The store is where the rubber meets the road,” said Adam Guy, director of research and consulting at InfoTek Research Group. “If a customer walks out of a retail store without knowing how to use those advanced features, there is a good chance they will never use them. Even if the services are meaningful, if the consumer does not know how to use them, they are eventually meaningless.”⁵²

⁵⁰ Id.

⁵¹ Id.

⁵² Id.

Importantly, no one-size-fits-all optimum exists. Rather than converge on a rigid standard, the market offers many variations. That allows customers to shop for the price-quality package that might best suit their needs. This heterogeneity applies to differences in network infrastructure, technology, advanced services, pricing, marketing, and customer service.

[A]nalytsts noted Verizon Wireless' promotional efforts highlighting its network quality have apparently made an impact with customers. . . . Verizon Wireless looks set to continue its network quality emphasis, saying it plans to increase capital expenditures from \$4.4 billion in 2002 to between \$4.4 billion and \$4.7 billion this year.⁵³

Unlike Verizon Wireless, AT&T Wireless' management made a point of telling analysts that the carrier plans to cut capital expenditures from \$4.8 billion last year to \$3 billion this year, noting the bulk of its GSM/GPRS network has been installed, and it plans only minimal expenditures on its TDMA network.⁵⁴

Alltel also announced its Simple Freedom prepaid offering last week, which should help the carrier in the non-contract market that many analysts feel the industry needs to attract if it wants to see subscriber penetration rates reach those of international markets.⁵⁵

Cingular recently reintroduced its Rollover plan first offered by parent company BellSouth Mobility in 2000. The plan allows customers to roll over their unused any-time minutes from month to month for up to one year. . . . "Rollover differentiates Cingular in a world dominated by 'big bucket' pricing plans," said telecommunications analyst Jeffrey Kagan.⁵⁶

IX. Third-Party Evaluations of Wireless Service Plans

When presented efficiently, customers often demand unbiased information about their wireless choices. The market does not fail to supply such information. Many publications, including those produced by news media or sponsored by consumer organizations, have a professional interest in providing buyers with valuable information. The emergence of the World Wide Web as a mass media has dramatically expanded the scope of such efforts and substantially lowered the cost for consumers to discover and access numerous evaluations. Various sources effectively compete for customers in the provision of objective information about product choices—CONSUMER REPORTS has no

⁵³ Dan Meyer, *With Slower Growth, Carriers Now Face Market-Share Battle*, RCR WIRELESS NEWS (Feb. 3, 2003), 4.

⁵⁴ Id.

⁵⁵ Id.

⁵⁶ Dan Meyer, *Carriers Add Local Calling Options*, RCR WIRELESS NEWS (Sept. 2, 2002), 9.

monopoly in this market. A small sample of evaluations of wireless service plans, both national and local to California, appears in Table 7. Many compare plans in specific market, by state, or by zip code.

The heterogeneity of plans makes evaluations subjective. Network operators take this as a given and spend large sums on sales personnel, advertising, network features, and product quality innovations designed to appeal to the subjective preferences of potential customers. Competitive reviewers also take this as given, and establish evaluative criteria appropriate to the audience served. Interestingly, regulatory interventions are constrained to be objective, as government must treat each party with equanimity. This undermines the ability of regulatory solutions to offer the diverse layers of information demanded by consumers.

Instead of reaching partisan conclusions, regulators attempt to devise impartial evaluative tools that rate each service with objective standards that can be clearly compared across competitors. The search for such standards is difficult at best, illusory and destructive at worst. By pursuing ostensibly objective evaluative criteria the regulator biases quality measures in two ways: First, they tend to be uniform, and second, they tend to be easily measured. Both serve regulatory objectives, which (ironically) are subjectively important to regulators but are often useless to actual consumers. Customers understand that many important dimensions of service quality are impossible to quantify in a simple metric that can be compared across systems; hence, their reliance not on technical data but on actual usage (including that of others whose experiences they solicit).

One third party evaluation concludes its network comparison thus:

Overall, carriers have created their own niches in the market. In the end, you'll have to figure out which features are most important to you, and then make up your own mind which carrier and plan to choose. But don't forget to ask your neighbors what plans they like. Because if your plan doesn't have good coverage in your area, your fancy phone will be as good as a wallet with no money inside.⁵⁷

Comparing alternatives involves an appraisal of network performance. As a practical matter, these key components of quality are not best evaluated by customers consulting formal evaluations, scientific data, or company financial information, but of asking neighbors whose phones seemed to work the best in that particular location. This reality is what renders lengthy, formalistic disclosure rules irrelevant at best, costly and hostile to consumer interests at worst. And it is what keeps an unregulated operator competing to discover new and better ways to keep customers saying good things about its service.

⁵⁷ HelloDirect.Com, <http://telecom.hellodirect.com/docs/Tutorials/Wireplan.1.032002-P.asp> (visited Feb. 12, 2003).

TABLE 7. INDEPENDENT EVALUATIONS OF COMPETING WIRELESS TELEPHONE SERVICE PLANS FOUND ON THE WWW (FEB. 2003)

Comparison of Carriers			
Organization	Date	Operators Compared	URL
Arizona Daily Star	May 22, 2002	Sprint, AT&T Wireless, Cingular, Verizon, Nextel, T-Mobile	http://www.azstarnet.com/public/startech/archive/052202/hottopic.html
Cell Phone Companies	Feb. 13, 2003	Verizon, Cingular, T-Mobile, Cricket, WorldCom, AT&T Wireless, Sprint, SunCom	http://www.cell-phone-companies-guide.com/articles_1.html
CellMania	Feb. 12, 2003	Cingular, AT&T Wireless, VodaFone, Orange, Airtel, Telstra	http://www.cellmania.com/
CheapCellPhones.com	Feb. 13, 2003	AT&T Wireless, Cingular, GlobalStar, Nextel, Sprint PCS, Verizon, T-Mobile, US Cellular	http://www.cellularservice.org/cellular_service.htm
Consumer Reports	Feb. 2003	Sprint, AT&T Wireless, Cingular, Verizon, Nextel, T-Mobile	http://www.consumerreports.org/main/detailv2.jsp?WebLogicSession=PhskClid7OC2PLDPYdhYdYqrXy9JaVL9RfROVHYAyt5S6smUN1Xl0j-999414436696074320/169937910/6/7005/7005/7002/7002/7005/-18799444788438016807/169937909/6/7005/7005/7002/7002/7005/-1&CONTENT%3C%3Eent_id=299617&FOLDER%3C%3Efolder_id=162691&bmUID=1041966090690
Free-Cell-Phone-FX GetConnected.com	Feb. 13, 2003	Verizon, AT&T Wireless	http://www.free-cellular-phone-deals.com/4787-cellular-phone-service-plan.html
	Feb. 13, 2003	AT&T Wireless, Cingular, Nextel, T-Mobile, Verizon, Yes Wireless (For Southern California)	http://www.getconnected.com/index.asp?affil=cj&AID=2340207&PID=1148446

Comparison of Plans by Zip Code			
Organization	Date	Operators Compared	URL
BetterCallingPlans.org	Feb. 12, 2003	Sprint, AT&T Wireless, Cingular, Verizon, Nextel, T-Mobile, Qwest, Cincinnati Bell, Alltel, MCI, Cricket, US Cellular, Tracfone, PriCellular, nTelos	http://onlineshopping.about.com/gi/dynamic/offsite.htm?site=http://bettercallingplans.org
Hello Direct	Feb. 12, 2003	Sprint, AT&T Wireless, Cingular, Verizon, Nextel	
LD Wiz	Feb. 13, 2003	AT&T Wireless, T-mobile, Verizon, Cingular	http://dwiz.com/cellular/
LetsTalk.com	Feb. 12, 2003	AT&T Wireless, T-mobile, Cingular, Sprint PCS, Verizon, Alltel, Boingo, Boost Mobile, Cellular One, Metro PCS, NTELOS, SunCom, SureWest, US Cellular	http://www.letstalk.com/
Long Distance Cellular Service	Oct. 2, 2002	AT&T Wireless, Cingular, Verizon, Nextel	http://www.long-distance-telephone-services.net/cellular_phone.html
LowerMyBills.com	Feb. 12, 2003	AT&T Wireless, T-mobile, Cingular	http://www.lowermybills.com/twi/index.jsp
Point.com	Feb. 12, 2003	AT&T Wireless, T-mobile, Verizon, Cingular	http://www.inphonic.com/specialoffer.asp?referringdomain=www.point.com&zipcode=90210&agent=&refcode1=&refcode2=&eid=&carrierid=57&oflag=specialoffer#
MyRatePlan.com	Sep. 1, 2001	Sprint, AT&T Wireless, Verizon	http://www.myrateplan.com/news/articles/softcell.php

Comparison of Plans, City Specific			
Organization	Date	Market / Operators Compared	URL
Ask Mr. Wireless	1998- current	Hampton Roads and Richmond, VA / AT&T Wireless, Sprint, T-Mobile, nTelos, Nextel, Alltel	http://www.askmrwireless.com/
BBB	Sept. 22, 1996	NYC / BA/Nynex; AT&T Wireless, Omnipoint, MCI, Sprint, CellularOne	http://www.newyork.bbb.org/library/publications/subrep63.html#Selecting

Consumer Forums			
Organization	Date	Market / Operators Compared	URL
eOpinion.com	Feb. 13, 2003	San Francisco, San Jose, Oakland / Cingular	http://www.epinions.com/elec-review-4753-319D900C-3A582DE1-prod2
eOpinion.com	Feb. 13, 2003	San Francisco, San Jose, Oakland / Verizon	http://www.epinions.com/elec-review-145D-27BC382D-3990A963-prod5

Even with the simplifications made to allow the comparisons seen in Table 7, the best choice ultimately depends on how one intends to use the network and the handset, one's preferences for convenience and the various functions offered, and the specific areas in which the phone will be used. The smart shopper can compare rival wireless phone services with easy-to-find evaluations on the web. But standardizing such comparisons in a regulated format would not be likely to offer the product promised—an objective appraisal useful to consumers.

X. Regulating Quality

All else equal, the customer prefers a low price. But complexity obtains when multidimensional aspects of quality arise, as in wireless telecommunications networks. Then a lower price may not be preferred, as it may purchase lower quality. Complexity implies that it is not obvious to third parties – such as regulators – how to measure and rank diverse product attributes. A prominent textbook on the economics of regulation analyzes the problem this way:

One reason for the minimal use of quality regulation is the cost of implementing it. To control any variable, the relevant economic agents have to be able to agree on what the variable is and what restrictions are placed on it. In the case of price and quantity, this is not difficult. The price is the amount paid by the consumer for the good, which is relatively easy to observe. Furthermore, restrictions take the simple form of numbers: a maximum price and a minimum price. Similarly, the measurability of quantity allows a regulatory agency to specify restrictions on it. However, quality is typically neither so well defined nor so easily observable. For example, the quality of airline service encompasses an array of variables, including on-time performance, safety, on-board services, seat width, and luggage handling. In principle, a regulatory agency could attempt to control each of these variables and thus control quality, but it would be very costly to do so. . . . Generally, economic regulation has not placed severe restrictions on the quality of products or services that firms offer with the notable exception of product safety.⁵⁸

Further, the regulation of specific quality characteristics can have unintended consequences. Firms facing regulation covering certain product characteristics have reduced the quality of unregulated product characteristics. Alternatively, regulation may force quality upward—with disastrous consequences. This occurred in the case of state regulations requiring certification of electricians. The heightened standards substantially raised hourly wages by both increasing quality and reducing supply. Many households responded by substituting out of the more professional electricians' services by performing wiring tasks themselves. A study found that the incidence of death by electrocution increased as a result.⁵⁹

This is a dramatic instance of a general result: incremental quality gains imposed by regulation may be less than their incremental cost. Consumers can be overprotected with rules that limit their ability to purchase the mix of services they desire. Sometimes this involves straightforward choices between high-priced, high-quality products and low-priced, low-quality products. But often it encompasses trade-offs between dimensions of products that are assumed to be important to the regulator—perhaps, the

⁵⁸ W. Kip Viscusi, John Vernon, and Joseph Harrington, *THE ECONOMICS OF REGULATION AND ANTITRUST* (Cambridge: The MIT Press, 2000), 300.

⁵⁹ Sidney L. Carrol and Robert J. Gaston, *Occupational Restrictions and the Quality of Service Received*, *SOUTHERN ECONOMIC JOURNAL* 47 (Apr. 1981).

availability of elaborate legal or technical information at point of purchase— and product attributes that are far more valuable to customers—such as the ability to make a quick purchase over the telephone.

XI. Cellular Rate Deregulation in 1994

Under the Omnibus Budget Reconciliation Act of 1993, state regulation of price and entry in the wireless market was pre-empted as of Sept. 1, 1994. The event presents a natural experiment testing the effects of regulation. If the state regulatory regimes benefit consumers, deregulation would presumably cause harm. This harm would be manifested in a reduction in the value of wireless services, as judged by consumers, and would be evidenced by a reduction in output adjusted for the underlying growth trend.

To test this proposition, one can observe market reactions following pre-emption of state regulation. With pro-consumer price controls limiting market power of cellular operators, which then operated as two-to-a-market duopolists, the removal of such controls would lead to substantial rate increases. Because quality may also be shifting, however, the key variable to observe is subscribership. Because subscribers take into account both price and quality, their willingness to purchase services should be a good indicator as to whether they believe that the *value* of wireless is becoming better or worse in the aftermath of rate regulation.

Of course, other factors may also be changing beside the elimination of rate regulation. Fortunately, we have a control group which we can also observe – consumers in states where rate regulation was not imposed. By comparing growth rates in cellular penetration (subscribers per capita) across these two sub samples during the period in which rate regulation ends, we can infer whether those in states losing the benefit of rate regulation appear to become less willing to subscribe to cellular service. This would evidence itself in a declining growth rate for the regulated sample relative to the growth rate for the unregulated sample after federal pre-emption.

State penetration data are not available for the period in question, but penetration was recorded quarterly for the top ten U.S. markets during the early 1990s.⁶⁰ These markets display both substantial cellular usage and heterogeneity with respect to regulation. Four of the top ten markets were in states that regulated cellular rates: New York, Los Angeles, San Francisco, and Boston. The other six were unregulated: Chicago, Philadelphia, Detroit, Houston, Dallas, and Washington, D.C.⁶¹

In California, state regulators protested the federal pre-emption, petitioning the FCC to allow continued regulation for a period of at least eighteen months (commencing Sept. 1, 1994). The CPUC expressed two findings of particular interest.

⁶⁰ *Data Flash: The Cellular Market Quarterly Review*, Quarterly Survey (Sept., 1996) Vol. 10, No. 4 HERSCHEL SHOSTECK AND ASSOCIATES, LTD., June 1997.

⁶¹ Before the Public Utility Commission of the State of California, *Investigation on the Commission's Own Motion Into Mobile Telephone Service and Wireless Communications*, Decision 94-08-022 (Aug. 3, 1994), App. 2.

1. Elimination of rate regulation would harm consumers through high prices:

“The CPUC believes that once substitutes to cellular service emerge, competition will bring down prices for wireless communications. However, substitutes to the existing cellular duopoly are a necessary condition for price competition. Until substitutes emerge and are widely deployed and available, it will be necessary to protect cellular consumers from unjust and unreasonable rates.”⁶²

2. Even under rate regulation, policy makers had been ineffective in promoting competition. This appears to contradict the previous claim, and is a revealing admission:

“[T]he CPUC presented evidence on how rates that were set nearly nine years ago have not fallen. The CPUC initially set the rates that cellular carriers could charge at what the market would bear in order to promote the growth of the industry. It was then anticipated that competition between the carriers in each market would drive down rates. That, however, did not occur.”⁶³

The conflict in the statements may be partly resolved by noting that the CPUC found that its regulation of cellular telephone rates was, while helpful, still too light-handed to effect the large price reductions which consumers deserved. This is implied in the CPUC’s August 3, 1994 opinion that stated:

“we consider the ‘relaxed regulation’ option to be premature at this time. The lifting of price caps would remove even the limited protections that currently restrain duopolists from charging rates even higher than currently exist for bottleneck services. Until the market becomes more competitive, we shall continue to impose price caps on dominant carriers in order to protect consumers from unreasonable rate setting practices.”⁶⁴

This begs the question as to why the existing regulatory structure was so weak, as well as the meta-question: since regulated wireless phone rates were determined to be “just and reasonable,” how is it that unregulated rates were to fall *seventy-five percent* between 1994 and 2001? The answer is easy: competition via FCC licensing of PCS. To the California Commission’s credit, it advocated such entry.⁶⁵ But the more subtle reality is that competitive entry did what price controls could not.

The data suggest, in fact, that rate regulation was not able to improve consumers’ position even partially. As seen in Figure 8, cellular penetration was substantially higher in states that did not regulate rates prior to 1994. Many factors could account for this

⁶² CPUC 1994b, 63-4.

⁶³ As cited in “Comments of the People of the State of California and the Public Utilities Commission of the State of California submitted to the Federal Communications Commission, *In the Matter of Implementation of Sections 3(n) and 332 of the Communications Act*, GN Docket No. 93-252 (Nov. 4, 1993).”

⁶⁴ California Public Utilities Commission, D.94-08-022, Investigation on the Commission’s Own Motion into Mobile Telephone Service and Wireless Communications, (Aug. 3, 1994), 69-70.

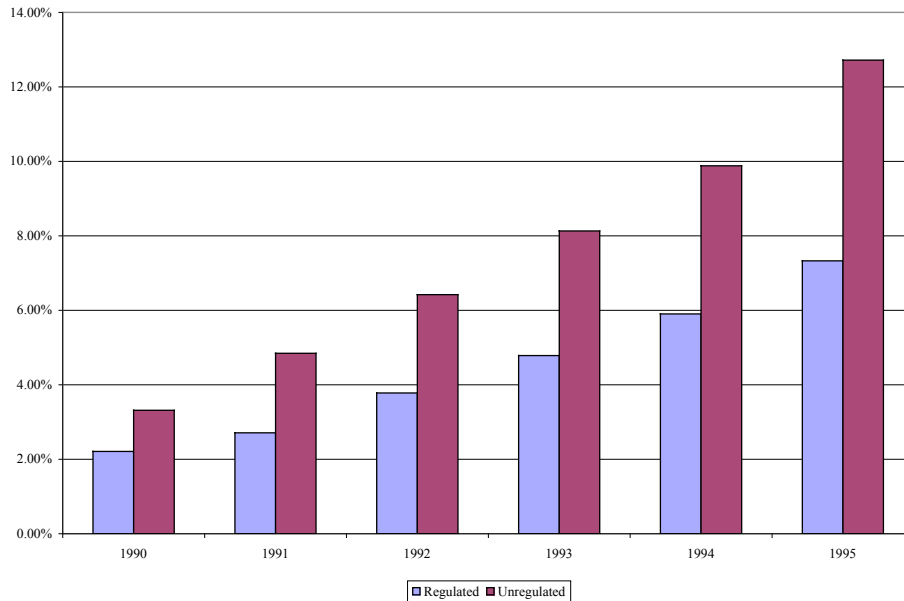
⁶⁵ CPUC 1994b, 13.

beside the regulatory difference, and so this intriguing relationship is left to be explained another day. What is seen in the analysis here is that subscribership does not decline in markets which were deregulated in Sept. 1994 relative to the growth trend in unregulated markets. Instead of wireless customers losing valuable regulatory protection with federal pre-emption of rate regulation, growth rates in the deregulated markets rise, relative to the unregulated sample, in 1995, the first year post-regulation. See Figure 9. The data seen in Figure 10, in fact, reveal that the first full quarter of deregulation coincides with the highest percentage growth of the 23 quarters between 1990-II and 1995-IV.

The picture offers basic, compelling evidence. If rate regulation had been succeeding, even as a stop-gap, to moderate real price increases for wireless subscribers, the markets which were protected by regulation should have exhibited relatively high subscriber penetration relative to unregulated markets, losing that advantage when the consumer protection mechanism was pre-empted. Yet, the most favorable interpretation that can be offered on behalf of rate regulation is that it does not appear to have had any significant effect. This precedent is important in at least two dimensions. First, it shows that even when market failure is present – as in the market power evident in the existing cellular duopoly⁶⁶ – rate regulation may fail to improve consumer welfare. This demonstrates that market failure is a necessary but insufficient condition in an argument justifying economic regulation. Second, it underscores that plausible theories about regulatory intervention, including those put forth by the California Public Utility Commission, should be subject to critical scrutiny. Here the facts show that the premise for regulation – that quality-adjusted rates would rise without it – was false.

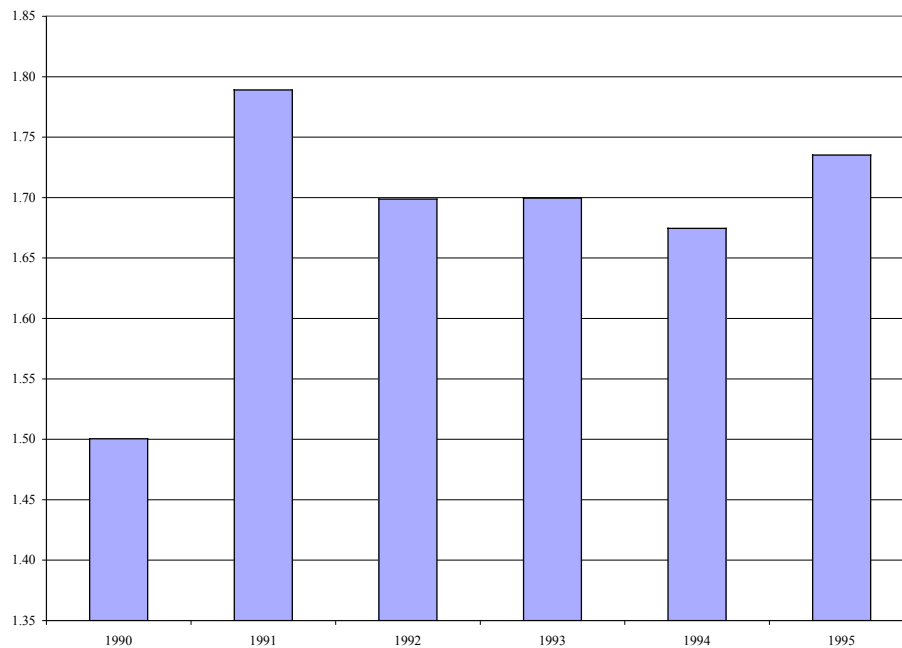
⁶⁶ The decision rendered by the CPUC on Aug. 3, 1994 relied extensively on my research in wireless telephone markets in its conclusions regarding market power. See CPUC 1994a, 50-1, 53, 61, 64.

FIGURE 8. MEAN PENETRATION RATES (SUBS PER CAPITA)
REGULATED V. UNREGULATED MARKETS



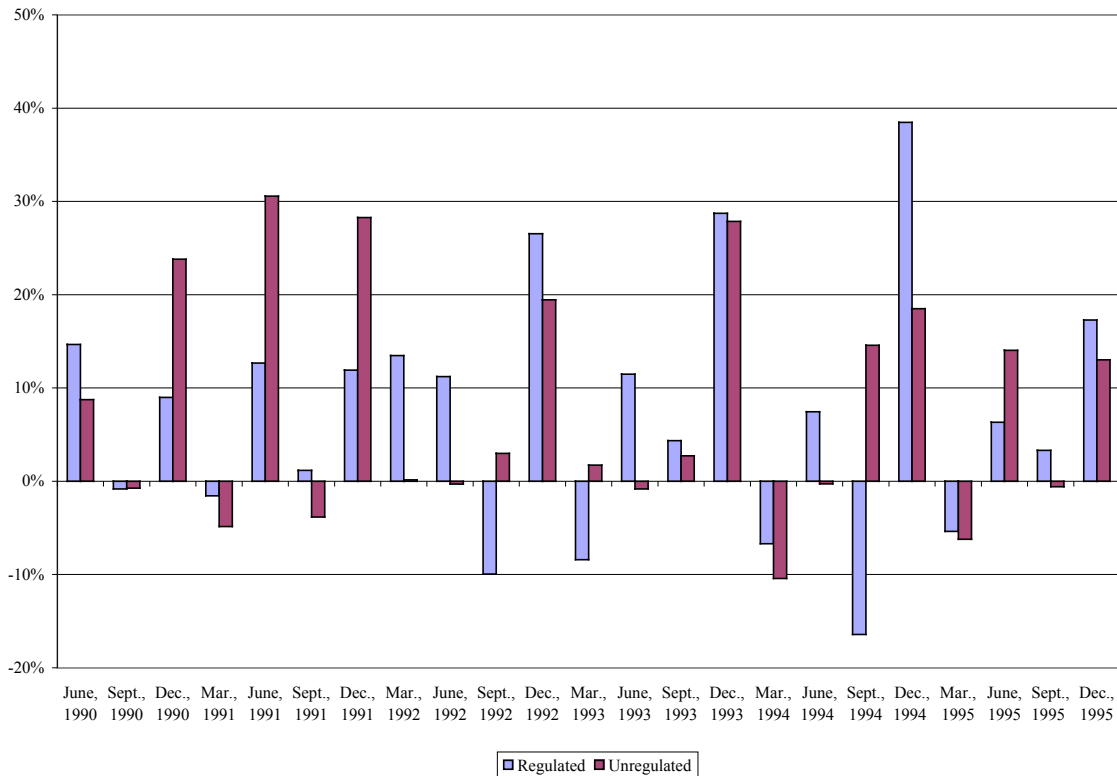
Note: Data for top ten U.S. markets by population. State rate regulation pre-empted as of Sept. 1, 1994.
 Regulated: New York, Los Angeles, San Francisco, and Boston.
 Unregulated: Chicago, Detroit, Philadelphia, Washington, D.C., Dallas and Houston.
 Source: *Data Flash: The Cellular Market Quarterly Review*, Quarterly Survey (Sept., 1996) Vol. 10, No. 4
 HERSCHEL SHOSTECK AND ASSOCIATES, LTD., June 1997.

FIGURE 9. RATIO OF UNREGULATED-TO-REGULATED MARKET PENETRATION, 1990-95



Source: *Data Flash: The Cellular Market Quarterly Review*, Quarterly Survey (Sept., 1996) Vol. 10, No. 4
 HERSCHEL SHOSTECK AND ASSOCIATES, LTD., June 1997.

FIGURE 10. QUARTERLY CELLULAR PENETRATION GROWTH
1990 II – 1995 IV, REGULATED V. UNREGULATED MARKETS



Source: *Data Flash: The Cellular Market Quarterly Review*, Quarterly Survey (Sept., 1996) Vol. 10, No. 4
HERSCHEL SHOSTECK AND ASSOCIATES, LTD., June 1997.

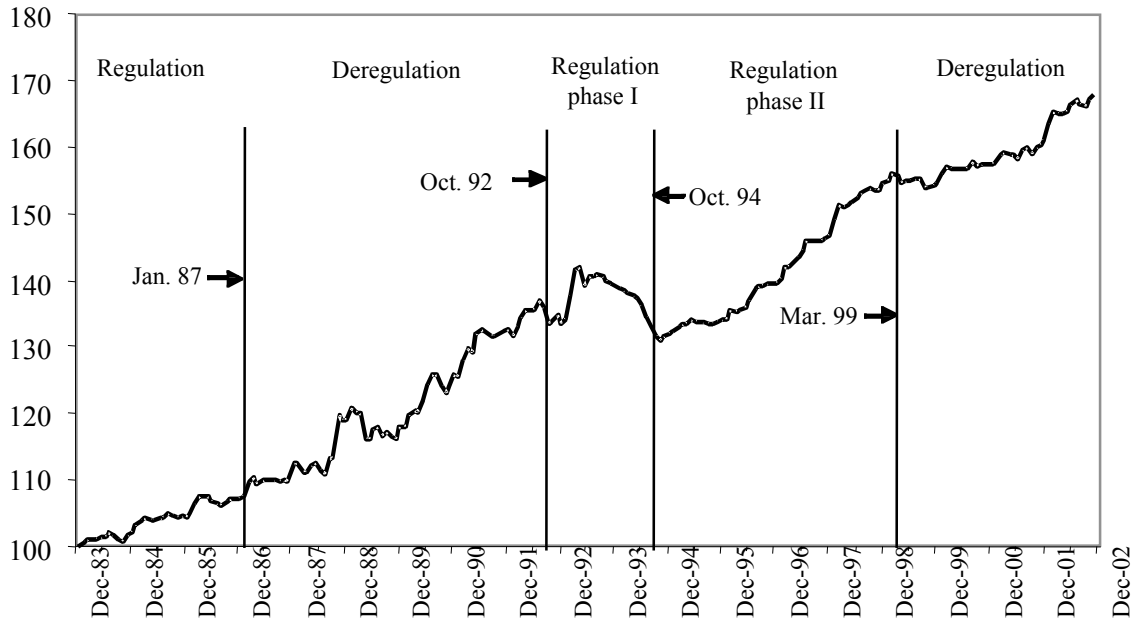
XII. Regulation and Quality: The Case of Cable Television

Despite being a prime candidate for rate regulation, given the substantial market power associated with local franchises, cable television consumers have not been protected by rate regulation. These rules have been shown to lower the quality of service and fully offset the value of price reductions for customers. The cable TV industry has repeatedly demonstrated that service quality and rate levels are linked, and that operators respond to regulations in ways that render the imposed constraints ineffective, even in the presence of market failure due to excessive concentration.

Price regulation in cable TV has been applied to basic tiers of programming. Pay channels, pay-per-view, and ancillary services (such as high-speed Internet access or cable telephony) have been exempted. Local governments franchise cable TV systems and traditionally controlled rates. In the 1984 Cable Act, however, the federal government pre-empted most local controls as of January 1, 1987. Re-regulation was then enacted in the 1992 Cable Act, which directed the FCC to work with municipalities to control basic service charges. Two rate rollbacks, totaling a maximum of 17 percent,

were imposed between September 1993 and July 1994. The 1996 Telecommunications Act, however, once again deregulated cable TV rates as of March 31, 1999.

FIGURE 11. REAL U.S. CABLE TV RATES, 1984–2002



Note: Cable rates for urban consumers deflated using CPI for urban consumers.
Source: Bureau of Labor Statistics, <http://data.bls.gov/cgi-bin/srgate>.

As seen in Figure 11, real cable rates trend upward during periods regulated and unregulated. (Just one brief exception – from mid-1993 to late-1994 – proves the rule, as discussed momentarily.) That is so since, as cable operators add quality—by increasing the number of channels offered and by spending larger amounts per program network, as well as undertaking other investments—demand increases and raises the profit-maximizing price. Robert W. Crandall and Harold Furchtgott-Roth found that the correlation between basic rates and system capacity (number of channels) was 0.99 using annual time series, 1982–1993.⁶⁷

Subscriber growth has been *positively* correlated with rate increases over time. The chain of events:

- cable systems improve quality of service
- demand increases
- subscribership rises even as cable systems raise rates.

⁶⁷ Robert W. Crandall and Harold Furchtgott-Roth, *CABLE TV: REGULATION OR COMPETITION?* (Washington, D.C.: Brookings Institution Press, 1996), 110.

The expected negative relationship between price and quantity demanded is obscured by a change in product quality (violating the *ceteris paribus* assumption generating the inverse relationship between price and quantity demanded). This market response undermines rate controls. As regulators push (nominal) prices down, operators invest less in product quality and more in regulatory evasion (shifting marketing efforts to unregulated services, for instance).

Subscriber growth rates tell the story. Were rate controls to reduce monopoly pricing without depreciating service quality, more customers would be attracted (by the quality-adjusted rate reductions), and the penetration rate for basic cable services would rise above trend. A deregulation of pro-consumer rate controls would reduce subscriber growth. Figure 12 displays annual subscriber growth in the top basic cable programming networks.⁶⁸ Basic cable growth was not negatively impacted when controls were relaxed in 1987, nor during the second federal deregulation in 1999. During re-regulation in 1994, however—as real cable rates were substantially lowered (about 10 percent from trend)—cable growth did not increase, but flat-lined.

Indeed, the effect of actually rolling back cable rates proved disastrous, as regulators quickly conceded. Cable operators slashed investments in high-quality programming in response to controls, curtailing growth. Between 1984 and 2000, the worst year for cable network subscriber growth was 1994—the year rate regulation reduced real cable rates, the only such price decline during the period. The worst two-year period for growth was 1993–1994. Rather than embrace these rate reductions, customers abandoned cable. While rates were lower, service quality deteriorated more rapidly, hurting consumers.

To reverse the situation, the Federal Communications Commission instituted new rules in late 1994; just months after its rate rollbacks, it began allowing generous price increases. As seen in Figure 11, real rates began rising—despite federally monitored rate controls—at about the same pace as in the previously unregulated period. The desired effect obtained; robust customer growth quickly returned. Even at higher prices, customers preferred higher quality—once supply incentives were restored.

⁶⁸ The series shown are for the major three basic networks in subscribership: TBS, ESPN, and USA. Each network bases its subscribership on how many households it reaches via cable, satellite, or other video subscription service. These series generally offer a clearer picture of the size of the basic cable TV universe than “basic cable subscribers” because the latter include limited basic subscribers who receive only retransmission of local broadcast TV channels.

FIGURE 12. THREE MAJOR BASIC CABLE NETWORKS, 1984-2003
SUBSCRIBERS (LEFT) AND ANNUAL GROWTH (RIGHT)



Note: Average of TBS, ESPN, and USA.

Source: KAGAN'S ECONOMICS OF BASIC CABLE NETWORKS 2003, September 2002 and KAGAN'S ECONOMICS OF BASIC CABLE NETWORKS 2000, July 1999, and KAGAN'S ECONOMICS OF BASIC CABLE NETWORKS 1993, July 1993.

There are numerous cross-checks for this explanation of events.⁶⁹ One interesting corroboration is found in a 1997 study by Willis Emmons and Robin Prager, which found that the rates charged in 1983 by competitive systems (head-to-head cable rivals, called “overbuilds”) were about 20 percent less than for cable systems not facing direct competition.⁷⁰ The study also found that this price difference was almost precisely the same in 1989, when rates had been deregulated (as of 1987). Since the monopoly price premium was estimated to be as large when rates were regulated as when rates were unregulated, consumer gains from controls appeared nil.

⁶⁹ Supportive evidence is reviewed elsewhere in greater detail. See Crandall and Furchtgott-Roth, *CABLE TV: REGULATION OR COMPETITION?*; Thomas W. Hazlett and Matthew L. Spitzer, *PUBLIC POLICY TOWARD CABLE TELEVISION: THE ECONOMICS OF RATE CONTROLS* (Cambridge: MIT Press, 1997); and Thomas W. Hazlett, *Cable Television*, chapter in Martin Cave et al., eds., *2 HANDBOOK OF TELECOMMUNICATIONS ECONOMICS* (New York: North Holland, forthcoming).

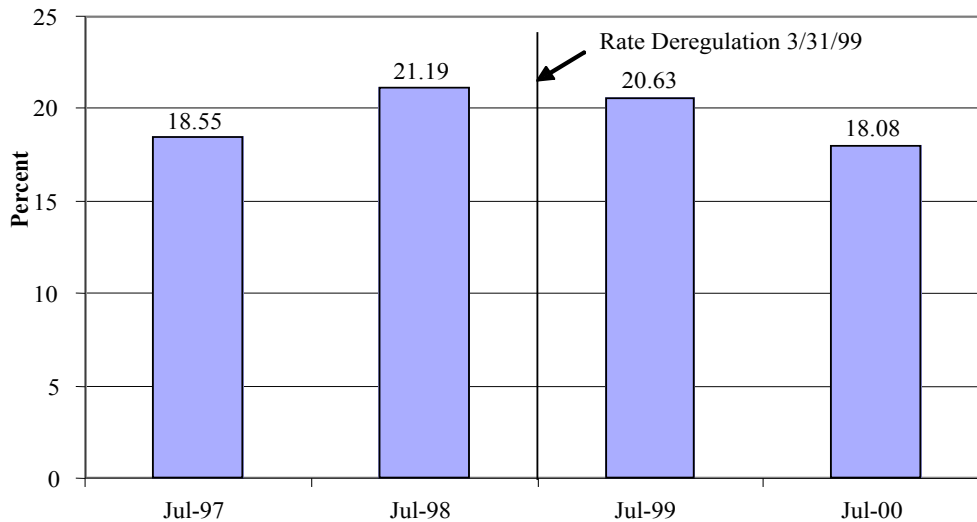
⁷⁰ W. M. Emmons III and R. A. Prager, *The Effects of Market Structure and Ownership on Prices and Service Offerings in the U.S. Cable Television Industry*, *RAND JOURNAL OF ECONOMICS* 28 (1997): 732–50.

Thanks to annual rate surveys conducted by the FCC pursuant to the 1992 Cable Act, surveys that specifically capture rate differentials in competitive and noncompetitive cable markets, we can now examine the pattern of monopoly premiums through the recent re-regulation and deregulation episodes.

As shown in Figure 13, the monopoly pricing premium varies only slightly between July 1998, with rates still regulated pursuant to the 1992 Cable Act, and July 1999, when rates had been deregulated (as of March 31, 1999) pursuant to the Telecommunications Act of 1996. The magnitude of the monopoly price premium is very close to 20 percent—just the size estimated by Emmons and Prager for either 1983 or 1989. The end of rate regulation did not appear to harm consumers in 1999–2001, results which mirror our previous findings.

Rate regulation is problematic when quality is difficult to monitor and relatively easy for operators to adjust. This result appears invariant to market structure and would obtain in competitive markets as well as in the monopoly franchises that dominate the cable industry. Moreover, the wireless telephone industry shares some characteristics of the cable TV industry—an evolving consumer product, a complex choice of technologies, and multidimensional quality levels. Quality-of-service regulations in the wireless sector would likely respond to market forces mirroring those at work in cable. Operators would predictably adjust prices or service provision such that the ratio of price to quality was unchanged or, with rules that created serious constraints on operator behavior, worse.

FIGURE 13. MONOPOLY PRICE PREMIUMS
AVERAGE MONTHLY RATE PER CHANNEL, 1997–2000



Notes: The competitive sample is composed of wireline overbuilds (including those involving local exchange carriers), but excludes “DBS overbuilds,” municipal systems, and low penetration systems. Non-competitive systems include regulated and deregulated systems. After March 31, 1999, only limited basic cable service could be regulated by municipal authorities.

1997 sample includes 402 non-competitive and 21 competitive (9 overbuilds and 12 LECs) operators.

1998: sample includes 447 non-competitive and 115 competitive (41 overbuilds and 74 LECs) operators.

1999: sample includes 446 non-competitive and 129 competitive (42 overbuilds and 87 LECs) operators.

2000: sample includes 457 non-competitive and 133 competitive (40 overbuilds and 93 LECs) operators.

Sources: Federal Communications Commission, Report on Cable Industry Prices (Dec. 11, 1997), 10, 24; Report on Cable Industry Prices (June 9, 2000) 12, 27; Report on Cable Industry Prices (April 4, 2002) 21-22.

XIII. Consumer Complaints in California Wireless

The need for the proposed consumer protection rules and their application to wireless carriers was recommended in a California Public Utilities Commission report, *Consumer Protections for a Competitive Telecommunications Industry*.⁷¹ The staff report asserts that “consumer complaints filed with the Commission provide examples of market abuse in the wireless market.”⁷² The report concludes that these complaint data indicate a problem best remedied by new regulations.

⁷¹ California Public Utilities Commission, *Consumer Protections for a Competitive Telecommunications Industry*, Telecommunications Division Staff Report and Recommendations (Feb. 3, 2000).

⁷² *Id.*, 4.

A more recent CPUC report, *The Status of Telecommunications Competition in California*,⁷³ echoes the earlier report's findings, and provides some basic complaint data. It notes that, "As telecommunications services have increased and diversified, the numbers of complaints have changed accordingly. Wireline complaints represented a decreasing portion of all complaints, whereas those relating to wireless have nearly tripled in their share of total complaints."⁷⁴

Every mass market service provider is likely to have *some* disgruntled customers. Even if theoretically possible, it would not be economically efficient to fully satisfy every customer. Customers prefer to purchase goods that are efficiently priced; perfection is too expensive. Businesses have strong incentives to maintain high levels of customer satisfaction, especially in an industry such as mobile telephony with major companies making long-term fixed investments that rely on the continued value customers associate with their brand name. Yet, efforts spent addressing the concerns of a dissatisfied customer reduce resources expended on other productive matters. Like all economic activities, there are diminishing returns: the most important (and numerous) complaints are extremely important to fix, others less so. Finding the right balance is the challenge all competitors face.

Whether customer concerns reach problematic levels can be analyzed in two ways. First, are there theoretical reasons to believe that competitive forces would not achieve the right balance? Second, how do the complaints either compare to those in other industries or change (within an industry) over time?

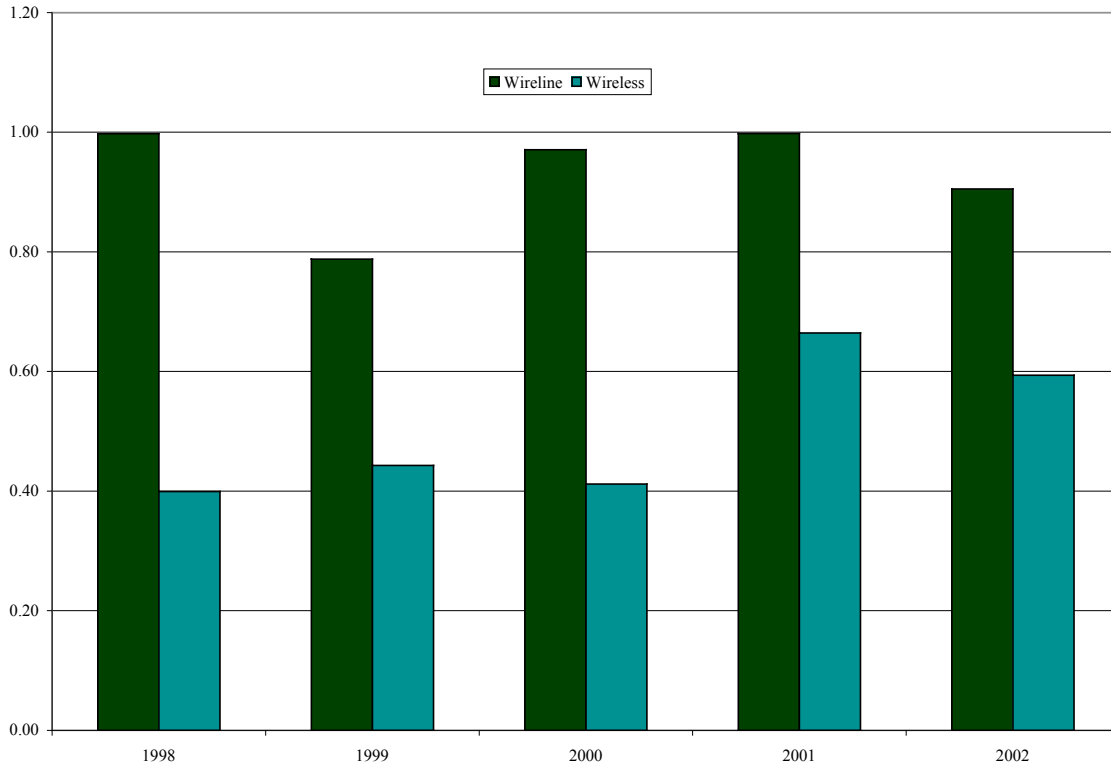
The high degree of competitiveness in wireless, both on the price and quality margins, implies that market forces will be effective in promoting customer satisfaction. This hypothesis appears to be supported by at least two pieces of evidence. The first is that consumer complaints per 1,000 subscribers, as registered with the California Public Utility Commission, are relatively low. In 2002, there were 0.91 complaints per 1,000 wireline subscribers to the CPUC, but just 0.59 complaints per 1,000 wireless subscribers. See Figure 14. In other words, wireline complaints were 54% more frequent. This suggests at least three conclusions.

First, the increase in customer complaints that the CPUC cites as motivation for new regulation is largely accounted for by growth in the customer base. That is to say, that between 1998 and 2002, annual wireless customer complaints to the CPUC increased from 2,818 to 9,427, or 235%. Subscriber growth alone accounts for 132%, or well over one-half, of that increase. But output actually rose far more than did subscribership; nationally, average minutes of use per month increased by over 240%, meaning that the incidence of complaints rose far less than did actual usage.

⁷³ California Public Utilities Commission, *The Status of Telecommunications Competition in California, Second Report for the Year 2002* (Feb. 28, 2003).

⁷⁴ *Id.*, 45.

FIGURE 14. COMPLAINTS PER 1,000 CALIFORNIA SUBSCRIBERS:
WIRELESS V. WIRELINE, 1998-2002



Note: 1998 California wireless subscribers estimated using 1999 and 1998 nationwide data.

Wireline and Wireless subscriber data is end of year except for 2002, which is from June.

Source: "The Status of Telecommunications Competition in California, Second Report for the Year 2002," CALIFORNIA PUBLIC UTILITIES COMMISSION, February 28, 2003. "FCC Releases Data on Local Telephone Competition," FCC, December 9, 2002; July 23, 2002; May 26, 2001; August 31, 2000; and August 31, 1999.

Second, while there is an increase in complaints per 1,000 subscribers, from 40 percent of the wireline level (which remains fairly constant, 1998-2002) to about 60 percent, the fact remains that the absolute value is substantially less than one. The increase is off of a very low base. Moreover, wireless complaints remain much less frequent than wireline complaints. This is a crucial finding, because wireline service is heavily regulated with respect to both price and quality. Competitive market forces are supplying solutions which generate considerably less frequent subscriber complaints than the solutions mandated by the CPUC.

Third, this result is impressive given the dynamic nature of wireless. Customer complaints occur most frequently when consumers do not receive the level of service they anticipate. A rapidly evolving market, with suppliers deploying new services and technologies, would seem vulnerable to a high level of customer complaints. As the market matures, as customers and suppliers both climb their respective learning curves, and as growth rates settle to levels sustainable for the long run, one would expect that fewer complaints would be registered. The decline in wireless complaints per 1,000 in

2002 indicates that this may already be happening. The fact remains, however, that the wireless industry has delivered robust growth and technological tumult while engendering far less frequent customer complaints as the relatively stable wireline sector.

XIV. Alternatives to Regulation

The marketplace is adept at discovering innovative approaches to customer service. After all, there is money in providing information or quality assurance that increases sales. As Nobel Laureate Ronald Coase, author of the seminal study, *The Nature of the Firm*,⁷⁵ has commented: “People talk about increases in improvements in technology, but just as important are improvements in the way in which people make contracts and deals.”⁷⁶ Firms search for ways to become more efficient in producing and marketing, and consumers benefit through the market’s selection of successful trials.

Wireless operators have thus been led to offer various levels of quality, service, and pricing. This rich array of options has been summarized above. But one additional, and interesting, area in which competitive firms offer transaction-cost saving devices has not received comment: resolution of customer complaints. When subscribers and carriers reach an impasse, what to do? It turns out that each of the major wireless service providers has established dispute resolution procedures that allow customer complaints to be remedied by independent adjudication at relatively low cost.

The major providers have similar complaint procedures. The customer must first notify the carrier about a disputed item, either by telephone or in writing. A customer must register the complaint within a fixed amount of time that varies by carrier (from 15 days for Sprint to 60 days for AT&T and T-Mobile). If customer service is not able to resolve the dispute within a set amount of time (30 days for Cingular and 60 days for AT&T), the next step is binding arbitration (except in some instances where small claims court may be appropriate). Arbitration is based on the Wireless Industry Arbitration (WIA) rules and administered by the American Arbitration Association (AAA). The carriers typically pay most arbitration costs. Damages are generally limited to direct or actual damages. The customer also typically waives her right to a jury trial in case the arbitration clause is invalid and also waives her right to sue as part of a consolidated or class action for a period of time, typically one to two years.⁷⁷

⁷⁵ Ronald H. Coase, *The Nature of the Firm*, *ECONOMICA* 4 (Nov. 1937): 386-405.

⁷⁶ Thomas W. Hazlett, *Looking for Results: An Interview with Ronald Coase*, *REASON* (Jan. 1997), <http://www.manhattan-institute.org/hazlett/rahazlett77.htm>.

⁷⁷ http://www.adr.org/index2.1.jsp?JSPssid=15747&JSPsrc=upload\LIVESITE\Rules_Procedures\National_International\...\focusArea\commercial\wireless_rules.html;
http://www.cingular.com/customer_service/common_ans?quesId=1183&idMark=WAS&idEstore=WAS;
https://www.attws.com/legal/terms_conditions.htm;
http://www1.sprintpcs.com/explore/include/legalTermsPrivacy.jsp?FOLDER%3C%3Efolder_id=334205&CURRENT_USER%3C%3EATR_SCID=ECOMM&CURRENT_USER%3C%3EATR_PCode=None&CURRENT_USER%3C%3EATR_cartState=group&bmUID=1048789874046;
https://shop.t-mobile.com/checkout/terms_conditions.html;
Verizon Wireless, Customer Service Agreement, FORM NATIONAL CA 10/2.

Such procedures are unlikely to be perfect, but they are probably highly efficient. Firms enjoy incentives to satisfy complaints quickly and amicably, maintaining brand name. They are also cost-conscious, preferring to resolve disputes than to pay counsel. Firms compete partly by offering alternative terms, and must fundamentally seek to protect a reputation for pro-consumer behavior. Alternative regimes are possible to construct, and might ultimately prove more efficient. But they ought to be fairly compared to the market alternative, and costs as well as benefits tabulated.

XV. Conclusion: Regulation as an “Opt In”?

When customer preferences are registered by independent surveys, satisfaction is relatively high in the wireless telephone sector. More pointedly, revealed consumer preferences are to buy more and more wireless services. Abundant evidence exists that these choices respond to the large-scale investments made in wireless technology in recent years, improvements in coverage and quality of service, and the sharp decline in the cost of using wireless telephones for local and long-distance calling.

Regulators were right to worry about the lack of competition in duopolistic cellular telephone markets a decade ago. But much has changed since then. For one, we have seen that the rate regulation imposed on cellular systems in some states, including California, was ineffective. Second, we observe that the six PCS licenses issued in each local market has invigorated competition, such that rates have effectively fallen in excess of seventy-five percent from the levels determined to be “just and reasonable” by state regulators just a few years ago. Competition has clearly proven the superior regulator in wireless, just as in so many other markets.

To impose a new round of regulatory structure on the wireless industry to police various terms and conditions of service contracts is to embark on an ambitious, and costly, enterprise. The complexity of the technologies and the size of the networks virtually assure an outcome that will surprise policy makers. The Law of Unintended Consequences provides that consumers, as well as wireless carriers, will respond to new mandates by changing terms not contemplated by proponents of the Telecommunications Bill of Rights. The key elements, including signature, disclosure, and termination period rules may strike regulators as common sense. But if they were both valuable and free to implement, the intense profit incentives of today’s competitive rivals would have driven implementation long ago – just as billions of dollars in fixed network infrastructure have been sunk, vigorous price competition launched, new data services offered, innumerable marketing campaigns waged, free phones awarded, free trial periods extended, and dispute resolution mechanisms offered—all to win customers.

Customer service is hardly an option for today’s wireless operators, whose vast networks will produce billion-dollar losses unless they can become, and stay, very busy. Without traffic generated by millions of paying customers, vast infrastructure will meet with financial ruin. In competitive markets, network underutilization is harshly penalized in capital markets.

Consumers do not evince a high demand for voluminous formal documentation as to the specifics of wireless telephone service. Given that their time is valuable, they rationally use economical devices to reduce transaction costs while gaining information to improve choices. Many sources of such information are available. First, customers become expert by using a given service. With the typical service contract at one to two years, subscribers find themselves actively (or casually) shopping for a wireless service provider fairly frequently, each time more knowledgeable than the last. Second, service providers have been prompted by market considerations to allow customers trial examination periods, from 14 to 30 days. They can test the service, and market coverage, of rival providers in order to select the system that best meets their needs. Third, numerous third-party evaluations are available via the World Wide Web, with national and local service plans described and evaluated. Fourth, users trade information with other local users, who have themselves become expert in using whatever rival systems they may subscribe to. And fifth, operators themselves are anxious to provide free or discounted telephones, sales information, handset repairs, and other elements of customer service (including arbitration to resolve disputes) to augment demand for their service.

Wireless telephone regulators have not achieved a good track record in consumer protection, as observed in the arguments made in California (and elsewhere) that rate regulation should be continued despite federal pre-emption. Conversely, consumers have demonstrated a pointed lack of interest in the costly expenditures of time regulators now seek to impose on the purchase of wireless telephone service. Hence, in contemplating these new rules, a reality check seems well advised. Why should these rules be more successful in promoting consumer interests than the regulations previously imposed?

Some burden of proof is appropriately required. This burden should not be merely rhetorical, however, but should give consumers and suppliers a genuine opportunity to evaluate the costs and benefits imposed by the Telecommunications Bill of Rights. Hence, I proposed the following:

The California Public Utility Commission should not impose its proposed requirements on wireless service contracts, but should allow individual customers to opt-in. That is, when purchasing services, subscribers would be given a choice as to the company's standard set of service plans, or, alternatively, service plans subject to the rules established under the Telecommunications Consumer Bill of Rights. They would properly disclose at the point of purchase what the differential costs would be in pursuing the regulated vs. unregulated options. The costs of pursuing the protections of the Bill of Rights would involve both the additional time required to satisfy the requirements of the signature and disclosure rules, as well as the difference in contracts offered under the regulated trial periods and regulation of early termination fees, etc. Of course, service operators would offer all these services competitively, and so the cost of services rendered would be efficiently supplied.

Because the purpose of the Telecommunications Consumers Bill of Rights is to empower consumers, it would be ironic if the consumer were deprived of disclosure as to the costs and benefits of making a transaction under these rules. And it would be even more ironic were he to be deprived of the opportunity to opt-out. In fact, given the low

level of complaint currently registered under the current system, and the expectation that few customers will elect to invest the additional resources to avail themselves of the protection that the CPUC contemplates extending them, it seems efficient to set the default to opt-out.