An Economic Analysis of

How Competition Has Reduced High Roaming Charges

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Abstract

A new regulation governing roaming agreements between wireless carriers would not be in the public interest. Indeed, such a rule could lead to increased prices, reduced investment, and substantial harm to consumers. The market for wireless services is highly competitive. This competition has led to decreasing prices, increasing coverage, and more subscribers in all areas, all of which have benefited consumers. At the same time, vigorous competition has reduced roaming prices and revenues.

There is no evidence of any market failure in the wireless market; in fact, consumers have prospered in the past 10 years without a mandatory roaming rule. A roaming rule would require complicated, expensive, and likely distortionary actions by the Commission, such as determining whether carriers are "similarly situated" and whether prices are "fair" and efficient. Given the highly competitive nature of the industry, the downward trend in prices and upward trend in coverage and subscribers, and the lack of any market failure, the Commission should not adopt a new roaming rule.

I. Introduction and Executive Summary

1. My name is Gregory L. Rosston. I am Deputy Director of the Stanford Institute for Economic Policy Research at Stanford University. I am also a Lecturer in the Economics Department at Stanford University. I received my Ph.D. and M.A. in economics from Stanford University, and my A.B. with Honors in economics from the University of California, Berkeley. My specialties in economics are industrial organization and regulation with an emphasis on telecommunications. I served at the Federal Communications Commission for three and one-half years as the Deputy Chief Economist of the Commission, as Acting Chief Economist of the Common Carrier Bureau, and as a senior economist in the Office of Plans and Policy. In these positions, I had significant involvement with the Commission's spectrum policy and auction-related issues. I have been the author or co-author of a number of articles relating to telecommunications competition policy and spectrum policy. My Ph. D. dissertation studied the effects of FCC policy on the land mobile radio industry. I have also co-edited two books on telecommunications. I have co-hosted three conferences on implementation of package bidding with the Federal Communications Commission. A copy of my C.V. is attached as Exhibit A to this report.

2. In this docket, the FCC invited parties to submit economic analysis concerning the provision of roaming services.[1] I have been asked by Sprint Nextel Corporation ("Sprint") to prepare such an analysis.

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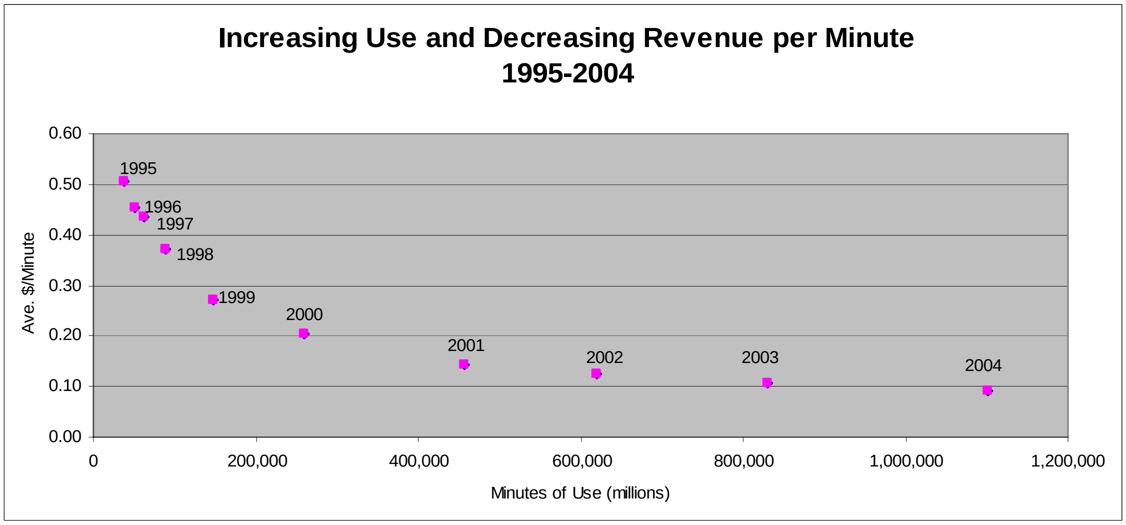
[1] Notice of Proposed Rulemaking on Reexamination of Roaming Obligations of Commercial Mobile Radio Service (CMRS) Providers, WT Docket 05-265, FCC 05-160, Rel. Aug. 31, 2005, ("Roaming NPRM"), paras. 28, 36, 37, 51.

3. Economic analysis of the wireless industry shows that the competitive market has worked extremely well for American consumers and that a new roaming mandate would not be in the public interest. CMRS prices—including roaming prices—have dropped substantially without a roaming rule over the past ten years and no demonstrated market failure justifies imposing a new rule. According to CTIA survey data, from December 1994 to December 2004 wireless subscriptions increased by 725 percent (20 million to 167 million) while average revenue per minute declined by 82 percent (from $0.53 per minute to $0.09 per minute).[2]

4. Figure 1 below shows the dramatic declines in revenue per minute and increases in usage over the past 10 years. CTIA survey data show average revenue per minute of use has dropped by about 80 percent while usage has increased by a factor of about 100.

[2] The figures from the CTIA surveys used in this report indicate trends, but cannot be presumed to show the precise level of changes. CTIA's semi-annual surveys are voluntary, meaning the companies that respond to particular questions may differ from year to year and not all companies respond to every question each year. CTIA reports the raw results from the survey and does not attempt to adjust the figures for the non-respondents or to make the results exactly comparable year-to-year.

Figure 1



Source: CTIA'S Wireless Industry Indices, Semi-Annual Data Survey Results, Year-end 2004 Results, Released June 2005, Tables 31 and 111. Note: Revenues include out-collect roaming revenues, activation fees, monthly service fees, vertical service features and data revenues. Revenues do not include toll service revenues, equipment revenues or taxes.

5. These price declines have come about in a largely unregulated environment that encouraged competition. In particular, the FCC designed and used spectrum allocation methods that ensured a competitive market for CMRS service and allowed companies to negotiate roaming agreements among themselves. This market-oriented approach successfully fostered competition and led to lower prices.

6. The FCC has been wise to avoid adopting a roaming mandate despite continuous claims from some carriers that one is necessary. Many of the same arguments that were originally brought to the Commission in 1995 are being repeated today, yet the market evidence shows that those fears were baseless. The FCC correctly resisted the temptation to impose new rules in 1996 and 2000 and should continue to do so now.

7. Not surprisingly, petitioners who advocate a mandatory roaming rule do not argue that *consumers* have been harmed by the absence of a rule. Instead, they focus on loss of revenues to some competing *firms*. Loss of revenues to particular firms, however, does not imply any market failure or consumer harm and does not justify

regulatory intervention. In this case, firm losses translate directly into consumer benefits since they result from increased competition for CMRS services leading to lower prices.

8. In addition to being unnecessary, a mandatory roaming rule would be complicated, requiring substantial intervention in the market to set prices and determine whether carriers are "similarly situated." The resulting effect on the market could easily blunt investment incentives and harm consumers rather than helping them.

9. Overall, absent any demonstrated market failure, a mandatory roaming rule would not be in the public interest. Since no market failure has been shown at this point in time, and especially no market failure that could be ameliorated by a roaming rule, the FCC should continue to resist the temptation to interfere in a well functioning marketplace.

II. Roaming Background

10. Wireless customers generally sign up for mobile service with a provider in their home region. Their "home provider" supplies them with wireless services directly and also acts as their agent in areas where the home provider has no service. In areas where the home provider does not have service, the provider may enter into an arrangement with other providers. In these cases, the networks exchange information about the customers and the services available to them so that the customer will be able to use services from the other ("visited") network. This setup is known as automatic roaming.[3]

[3] In contrast, with manual roaming the user must establish a relationship with the visited system (typically by supplying a credit card number) before making a call. In this paper, "roaming" refers to automatic roaming.

11. When cellular service began in the 1980s, service was generally offered regionally and roaming was a high-priced system for traveling out of the home region. Typically, users paid the highest prices in rural areas Those high prices resulted primarily from the lack of competition: at the time only two carriers were licensed in each market and nationwide coverage by a single integrated carrier as we now know it did not exist. Prior to the PCS auctions, the largest wireless carrier, AT&T, served substantially less than half of the nation's population.

12. Rural carriers typically hosted far more roaming traffic than their customers generated on other networks. As a result, rural carriers had little to lose from charging high roaming prices. Their own customers would not face high roaming prices if they did not roam and the carriers could reap the benefits of high charges levied on the price inelastic roamers. In 1999, the FCC noted that "Traditionally, roaming was a very lucrative part of operators' business, with prices typically ranging between $0.50 and $1.00,"[4]

13. Since that time, the market has changed significantly. As discussed in more detail below, the addition of several new providers in each area has made the CMRS market very competitive. In addition, carriers have put together near national networks and can acquire spectrum to fill in holes, changing their incentives with regard to roaming charges.

14. In 1998, for example, AT&T introduced the Digital One Rate plan. Customers who signed up for this plan paid a single rate no matter where in the country they were,

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[4] Fourth Report 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, FCC 99-136, Rel. June 24, 1999, p-23.

regardless of whether they were on AT&T's network or a roaming partner's network. The initial charges were $60 for 300 minutes nationwide and $150 for 1400 minutes.[5] "One Rate" fundamentally changed the nature of competition in the industry and put substantial downward pressure on roaming rates. Because higher roaming charges would increase AT&T's costs but could not be passed directly on to One Rate subscribers, AT&T suddenly had a stronger incentive to insure itself against supracompetitive roaming charges.[6] Other carriers were forced by competition and business reasons to follow AT&T's lead and offer nationwide packages as well, although the packages differed in some respects. The nationwide competition put pressure on all roaming partners to reduce roaming charges.

15. Competition for these national packages has reduced retail prices dramatically: today's One Rate plan, now called "Cingular Nation," charges consumers $40 for 450 minutes of use (and $80 for 1350 minutes).[7] Sprint also now offers nationwide plans with no roaming charges. Its "Fair and Flexible" plans range from $30 for 200 minutes to $100 for 2000 minutes.[8] These low prices result from competition for the home wireless service and the reduction in roaming charges.

16. The reduction in roaming costs has been substantial. Over the past 10 years, CTIA data depicted in Figure 2 indicate a reduction of more than a factor of ten. The data in the figure result from dividing the reported roaming minutes of use by the reported roaming revenue each year. In that sense, the figure does not show a price *per se*,

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[5] Murray, James, Wireless Nation, p-277.

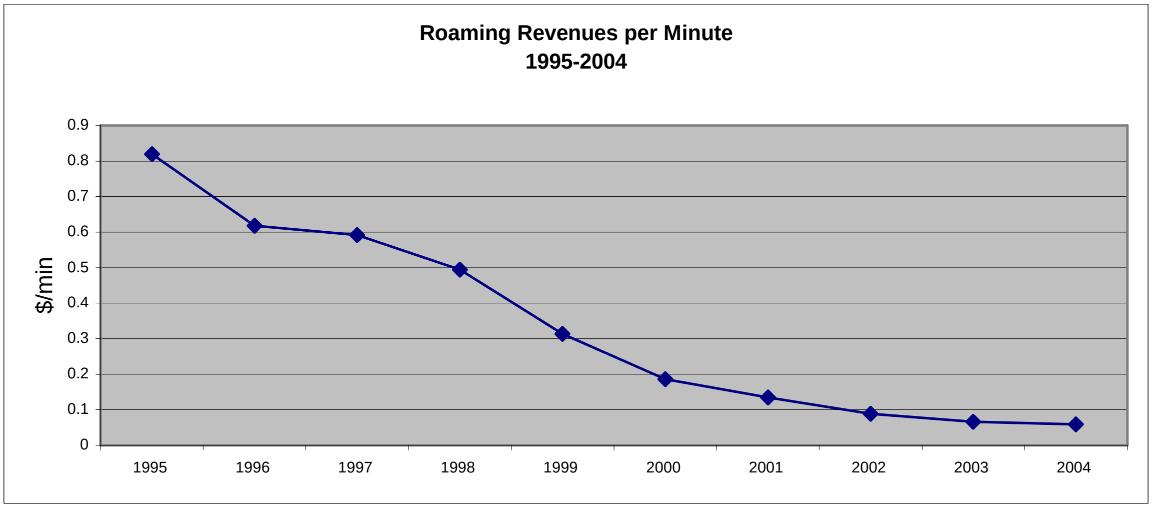
[6] While AT&T had an incentive to negotiate low roaming rates prior to the introduction of Digital One Rate, the incentives were lower as it did not face directly the risk of high roaming prices.

[7] Rates found on www.cingular.com, accessed 10/27/2005.

[8] Rates found on http://www.sprint.com/personal/wireless, accessed 11/15/2005.

and, as discussed in footnote 2 above, problems in the underlying survey data make comparisons across years and variables imprecise. Despite these drawbacks, the figure highlights the dramatic general trend in the marketplace – roaming charges have decreased substantially.

Figure 2



Source: CTIA'S Wireless Industry Indices, Semi-Annual Data Survey Results, Year-end 2004 Results, Released June 2005, Tables 35 and 111.

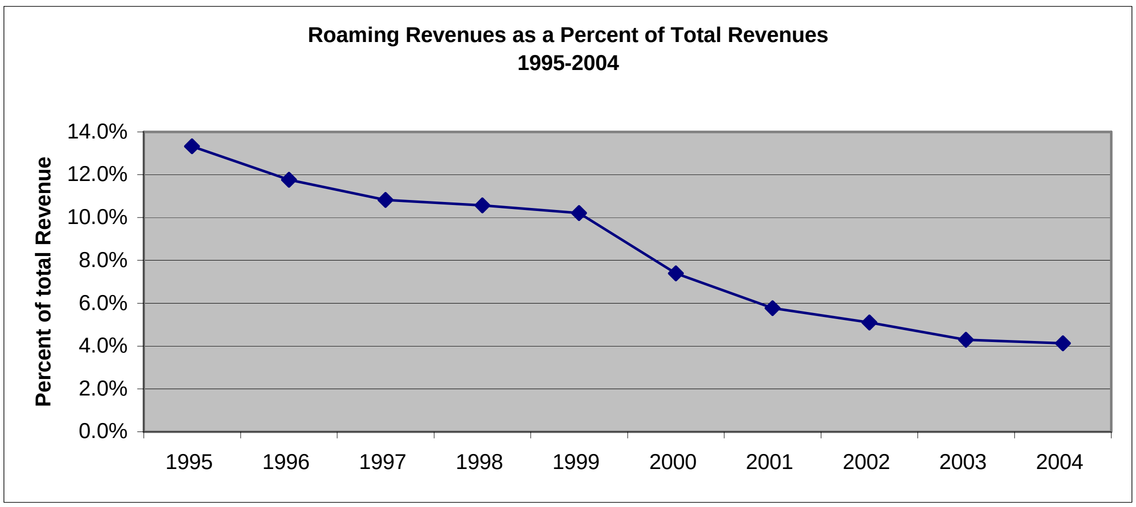
17. Competition, price reductions, and the creation of national markets have greatly benefited consumers—including rural consumers—but not necessarily the incumbent rural wireless providers. While some rural carriers responded to competition by becoming more efficient and, in some cases, merging to take advantage of scale economies and more sophisticated management, it is not surprising that, in the face of increased competition, carriers have been unable to maintain profits and prices above the competitive level.

18. This new competition has reduced home rates for rural consumers and has given outside wireless carriers options for how to serve the roaming needs of their customers. Instead of relying solely on a single carrier, companies like Sprint can

choose how to serve their customers and the presence of choices has forced roaming charges in those areas down substantially.

19. These changes are evident in the reduction in roaming revenues as a percent of total wireless revenues. Figure 3 shows the substantial decline from 1995 to 2004 based on CTIA data. Roaming minutes have increased due to the phenomenal growth in overall wireless usage, but roaming has become a smaller fraction of industry revenue in large part because non-roaming minutes have increased more rapidly and because the cost of roaming has declined substantially.

Figure 3



Source: CTIA'S Wireless Industry Indices, Semi-Annual Data Survey Results, Year-end 2004 Results, Released June 2005, Tables 31 and 111.

III. An Economic Framework

20. Any analysis of a roaming rule should focus on consumers.   The Rural Telecommunications Group ("RTG"), in an *ex parte* filing, contends that some firms may possess "market power" in roaming, thereby presumably harming competition

and consumers.[9] The DOJ/FTC Guidelines provide a framework for evaluating potential competitive issues and harm to consumer and thus a sensible way to analyze RTG's contentions.[10] Part of the framework is to undertake a market power analysis.

21. The first step in a standard competition analysis under the DOJ/FTC Guidelines is to define the relevant market(s). This definition includes both relevant product and geographic market(s).[11] The second step is to assess the degree of competition within the relevant market(s).[12] Finally, the analysis should consider other factors that might affect the competitiveness of the market.[13]

22. In its recent analysis of the AT&T Wireless/Cingular merger, the Commission reaffirmed that the focus should be on consumers, not on carriers, that CMRS technology type cannot be considered a market, and that firms could not raise roaming rates for anticompetitive reasons. In particular, the Commission stated:

> Finally, we stress again that our concern in this context is with the effect of this merger on consumers of mobile telephony services, not on particular mobile telephony carriers per se. In this regard, we believe that an overall disciplinary force in the context of the intercarrier market for roaming services is that customers of various firms always have the option to switch to firms employing other air interfaces. In other words, if any mobile telephony consumers – regardless of whether they are on GSM, TDMA, or analog-only plans – were to find that the roaming aspects of their wireless service plans became less favorable (whether in terms of price or in terms of coverage) as a result of this merger, they would always

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[9] Letter from Caressa Bennet to Marlene Dortch, WT Docket No. 00-193, February 9, 2005.

[10] United States Department of Justice and Federal Trade Commission, "Horizontal Merger Guidelines," Revised April 8, 1997. ("DOJ/FTC Guidelines")

[11] DOJ/FTC Guidelines, Section 1.

[12] *Id.* at sections 1.3-1.5.

[13] *Id.* at section 3.

> have the option not only to upgrade to a GSM plan (in the case of TDMA or analog customers), but to switch to a CDMA-based carrier altogether.[14]

23. The Commission's approval was based on the conclusion that competition would ensure that the merger would not create market power. In the case of a proposed regulation rather than a merger, a competitive market and the lack of a demonstrated market failure implies no need for additional regulations since there would be no competitive problem to correct. If, contrary to the facts of the wireless marketplace, analysis were to reveal competitive problems that harm consumers, then the FCC should consider whether a proposed regulation would address the specific market failures, whether the expected benefits of the regulation would outweigh its costs, and whether other solutions could improve the situation more efficiently. Note that the FCC recognized this very point in one of its earliest roaming NPRMs:

> Our consideration of automatic roaming issues is framed by three general questions. First, is there a need for Commission action? Second, if we are persuaded that regulation would serve the public interest, what specific action should be taken? Third, what are the disadvantages of such action, especially as to network costs and additional burdens on providers, particularly smaller providers?[15]

A. Define the relevant market(s)

24. The DOJ/FTC Guidelines define a relevant market as the smallest set of products and geographic area such that control by a single entity could hypothetically be profitably

[14] Order In the Matter of Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation For Consent to Transfer Control of Licenses and Authorizations File Nos. 0001656065, et al., FCC 04-255, Rel. Oct. 26, 2004 ("AT&T/Cingular Merger Order") para. 180.

[15] In the Matter of Interconnection and Resale Obligations Pertaining to Commercial Mobile Radio Services, CC Docket No. 94-54, FCC 96-284, Rel. August 15, 1996, para. 18.

monopolized.[16] In the AT&T Wireless/Cingular and Sprint/Nextel mergers, the FCC identified separate markets for mobile voice and data services and for residential and enterprise customers, but analyzed the transaction under a combined CMRS market definition.[17] For purposes of investigating whether a CMRS roaming rule is appropriate, this product market definition is also appropriate. While the FCC used the term "intercarrier market for roaming services," its discussion immediately following the use of the term demonstrates that roaming is not a relevant antitrust market and the appropriate product market is CMRS service.[18] The FCC analysis shows that controlling one technological type of roaming would not enable a company to effectuate a profitable price increase. In order to increase prices profitably, a company would have to control CMRS services overall, the *sine qua non* of an appropriately defined relevant product market.

25. For a consumer deciding to acquire wireless service, the appropriate relevant geographic market is, in most cases, the set of wireless providers offering services in the consumer's home area. This would include all of the facilities-based carriers as well as the so-called MVNOs offering service in the area.[19]

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[16] DOJ/FTC Guidelines §§ 1.11, 1.12. *See also* Gregory Werden, *The 1982 Merger Guidelines and the Ascent of the Hypothetical Monopolist Paradigm*, 71 ANTITRUST L.J. 253 (2003).

[17] AT&T/Cingular Merger Order, para. 74. In the Matter of Applications of Nextel Communications, Inc. and Sprint Corporation For Consent to Transfer Control of Licenses and Authorizations File Nos. 0002031766, et al., FCC 05-148, Rel. Aug. 8, 2005, para 38.

[18] AT&T/Cingular Merger Order, para. 180.

[19] There may be cases where a customer could purchase "nationwide" service from a carrier that does not have facilities in the "home" area and use the service primarily in the "home" market. However, I will ignore them for the purposes of this analysis. To the extent that such possibilities are more common than I assume, they would increase the amount of competition in the market by widening the relevant geographic market or increasing the identity of the suppliers in the market. The FCC and DOJ adopted this geographic market approach in their merger reviews.

26. Consumers shop among the different wireless providers and switch providers frequently.[20] When choosing a wireless carrier, consumers consider all of the features and functionality a carrier offers, including handsets, data features, reputation for quality, coverage (including roaming) and other factors. They then choose a carrier, handset, and plan that best fit their unique preferences. While coverage (including roaming) is one of the features that some consumers consider when making a choice, the ability to roam on a specific technology in a specific geographic area cannot be considered a market.[21] No consumer-focused application of the DOJ/FTC Guidelines would lead to a relevant market defined in such a way because for the most part consumers do not make their subscription decisions based on specific technology – they decide based on other factors like coverage and price.[22]

27. Narrow technology-specific relevant markets would be inappropriate because a hypothetical monopolist of a specific technology in another area could not increase prices profitably in the home market by raising roaming charges. As the FCC noted in the recent merger analysis quoted above, higher roaming rates for one specific technology would lead consumers in the home market to choose other technologies.

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[20] According to the FCC, carriers report a customer "churn rate" of 1.5 to 3.0 percent per month (or upwards of 18-36 percent per year. Tenth Report 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, WT Docket No. 05-71, FCC 05-173, Rel. Sept. 30, 2005, ("Tenth CMRS Report"), para 149.

[21] The RTG would like the Commission to believe that competing technologies allow firms to harm consumers by exercising market power. In arguing for mandatory roaming agreements they ask the Commission to "determine whether recent CMRS industry mergers have created a market scenario where a virtual duopoly controls each CMRS technology type" Letter from Caressa Bennet to Marlene Dortch, WT Docket No. 00-193, February 9, 2005. In this assertion, RTG makes the implicit assumption that the relevant market is CMRS technology type.

[22] The FCC supports this conclusion in the AT&T/Cingular Merger Order, para. 92. "We agree with the Applicants that consumers do not distinguish mobile telephony service by license or technology type."

Because of this straightforward logic, the DOJ and FCC both chose to analyze recent mergers using overall CMRS as the relevant markets; neither agency used technology-specific roaming markets in its analysis.[23]

B. Assess competition in the relevant market

28. The wireless marketplace is competitive. By December 2004 there were more than 181 million wireless subscribers—more than doubling in the past five years.[24] By September 2004 about 97 percent of the U.S. population lived in counties with at least three mobile services providers, 88 percent lived in counties with five or more, and 41 percent in counties with six or more.[25] Consumers have benefited greatly from the competition in wireless services and are likely to benefit even more in the future.[26]

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[23] United States of America, State of Connecticut, and State of Texas, *Plaintiffs*, v. Cingular Wireless Corporation, SBC Communications, Inc., BellSouth Corporation and AT&T Wireless Services, Inc., *Defendants*. Civil No. 1:04CV01850 (RBW) Filed: October 29, 2004; AT&T/Cingular Merger Order; In the Matter of Applications of Nextel Communications, Inc. and Sprint Corporation For Consent to Transfer Control of Licenses and Authorizations File Nos. 0002031766, et al.

[24] Tenth CMRS Report, Table 2.

[25] Tenth CMRS Report, Table 5. It should be noted that these figures do not include the effect of the Sprint merger with Nextel. In its analysis of the Sprint-Nextel merger, however, the Commission noted that "in the post-merger environment, there will be a continuing presence of multiple other substantial carriers in each overlap market with the capacity to add subscribers and the ability to add capacity. As a result, we believe this transaction is unlikely to result in collusive behavior or create 'unilateral' market power on the part of the merged firm. We also find that there are no local markets where post-merger conditions would require a divestiture remedy. Sprint and Nextel have been the third, fourth, or later entrants into individual markets. Finally, we find that public interest benefits should result from this transaction and flow to consumers, including improved service quality and broader deployment of the next generation of advanced wireless services…." Memorandum Opinion and Order in the matter of Applications of Nextel Communications, Inc. and Sprint Corporation For Consent to Transfer Control of Licenses and Authorizations File Nos. 0002031766, et al., para 3.

[26] One estimate of consumer surplus from CMRS is $80 billion annually. *See* Thomas W. Hazlett and Matthew L. Spitzer, "Advanced Wireless Services, Spectrum Sharing, and the Economics of an Interference Temperature," paper submitted to the Federal Communications Commission, In the Matter of Establishment of an Interference Temperature Metric to Quantify and Manage Interference and to Expand Available Unlicensed Operation in Certain Fixed Mobile and Satellite Frequency Bands, ET Docket No. 03-237 (April 5, 2004).

29. Competition has led to rapid innovation in wireless services. From their clunky analog voice-only beginnings, wireless firms have rapidly added new services that consumers value, including the ability to send email, take photos, use short messaging and other advanced data services. These improvements continue unabated. Carriers, spurred by competition, have spent billions of dollars in building and expanding their networks and are upgrading their networks to "3G," rolling out video and broadband services, and investigating "4G" capabilities. In less than 10 years of operation, Sprint has implemented three generations of technology throughout its network: it started with 2G (IS-95), followed by 2.5G (1x), and most recently with 3G (EV-DO). Each implementation required extensive investment and has led to benefits for consumers through higher quality and increased bandwidth.

30. Competition has benefited consumers in other ways, too. Consumers enjoy a wider variety of pricing plans than they have in the past, including "family" plans that allow additional handsets to share minutes for a small additional fee and pre-paid plans that require no contracts. Features such as text messaging, voice mail and many other services developed under competition also add to consumer welfare.

31. Rural customers also enjoy competitive provision of CMRS services. The FCC finds that while there tend to be more competitors in urban areas, even areas with fewer than 100 people per square mile have, on average, 3.7 mobile competitors.[27] Indeed, the FCC concludes that rural markets are competitive:

> Based on our rollout analysis and information provided by commenters, we conclude that CMRS providers are competing effectively in rural areas. While it appears that, on average, a smaller number of operators are

[27] Tenth CMRS Report, para 94.

> serving rural areas than urban areas, this structural difference is not, by itself, a sufficient basis for concluding that CMRS competition is not effective in rural areas. To the contrary, market structure is only a starting point for a broader analysis of the status of competition based on the totality of circumstances, including the pattern of carrier conduct, consumer behavior, and market performance as discussed more fully below. Despite the smaller number of mobile operators in rural areas as compared to urban areas, there is no evidence in the record to indicate that this structural difference has enabled carriers in rural areas to raise prices above competitive levels or to alter other terms and conditions of service to the detriment of rural consumers. In addition, data and statements presented by commenters on the *Tenth CMRS PN* support the conclusion that there is effective competition with respect to CMRS in rural areas.[28]

32. Wireless firms compete along a number of dimensions including, for example, available services, quality, handsets, and service plans. Different technologies—GSM, CDMA, iDEN, etc—have different advantages for particular services. Competing technologies has been important for promoting innovation and product differentiation. The FCC notes that

> Theory and evidence suggest that allowing the use of multiple standards may have several pro-competitive advantages over standardization of wireless network technologies. Since the types of services tend to differ across technologies, use of multiple standards may result in greater product variety and greater differentiation of services offered by carriers using different technologies. Diversified and heterogeneous services make it more difficult for carriers to coordinate their behavior so as to restrict competition with regard to pricing. Other potential pro-competitive advantages of multiple standards include greater technological competition and greater price competition between operators using different technologies.[29]

33. By all reasonable measures the CMRS market is competitive, and consumers have benefited tremendously. Customers in rural markets have seen substantial increases in competition and reductions in prices (including often the ability to take advantage

[28] Tenth CMRS Report, para 95, footnotes omitted.

[29] Tenth CMRS Report, para 107, footnotes omitted.

of the same pricing plans offered in urban areas). Urban customers have also benefited from the increase in rural competition because that competition reduced high roaming rates, which in turn allowed reduced prices for nationwide, "no roaming," calling plans.

C. Incentives and ability to raise prices artificially

34. The nature of roaming has also changed as the market has matured. For example, demand for nationwide plans has increased the incentives for firms to build out their networks as broadly as possible. As a result, some firms may now need fewer roaming agreements than they did in the past.

35. Without a roaming mandate, two carriers without coverage overlap (either directly or with affiliates) have an incentive to reach a roaming agreement to increase geographic coverage for their customers and to generate revenues from the other carriers' customers who will roam on its network. Despite the incentive to reach an agreement, under some conditions the two carriers might not reach a deal. The two companies, for example, may not be able to agree on a price. One of the firms might want to charge a roaming price that the other firm feels is too high. In this case, the firm might decline a deal. For example, many wireless companies charge a certain amount per minute for on-network calls (after the initial "bucket") and a different per minute amount for all off-network roaming calls. When customers roam onto networks that charge especially high prices, their home network operator ends up

paying the higher price without signaling those customers that they are using an expensive resource.[30]

36. The market is likely to ensure that the price is not too high. As the FCC recognized, ultimately consumers have the ability to switch providers if roaming rates are too high. As a result, either carrier (large or small), as the agent of its customers, could balk at the high rates being proposed for roaming and decide not to enter into an agreement.

37. Another important reason why a firm may decline to enter into a roaming agreement is because of the availability of roaming services from other roaming partners, or because of a special relationship with another carrier. In addition to extensive operations throughout the country, Sprint has relationships with “affiliates” and roaming partners in a variety of markets throughout the country. Where Sprint (or other carriers) compete directly with carriers in the home market for customers, it is not surprising that Sprint would not want to provide its competitors with below market price roaming deals. Nor is it surprising that its competitors would want access to roaming at prices below those which they could get through negotiation.

38. Because there is “robust competition” in the market for end user customers,[31] and the ability to roam is a feature of competition in the marketplace, a firm may find it

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[30] A lack of price signal to the end customer is similar to the effects of Section 254(g) of the Telecom Act, which mandates geographically averaged long distance calling rates. Several small local carriers took advantage of the fact that the averaging requirements meant that their customers would not pay for the higher access charges they passed on to the long distance companies. When the long distance carriers saw these higher access charges, they tried to deny service to the small companies. The FCC decided that while it would not allow denial of service it would reduce the access charges. A better way would have been to allow the long distance companies to refuse to pay the higher prices and see if the market would in turn discipline the local carriers.

[31] Tenth CMRS Report, para 204.

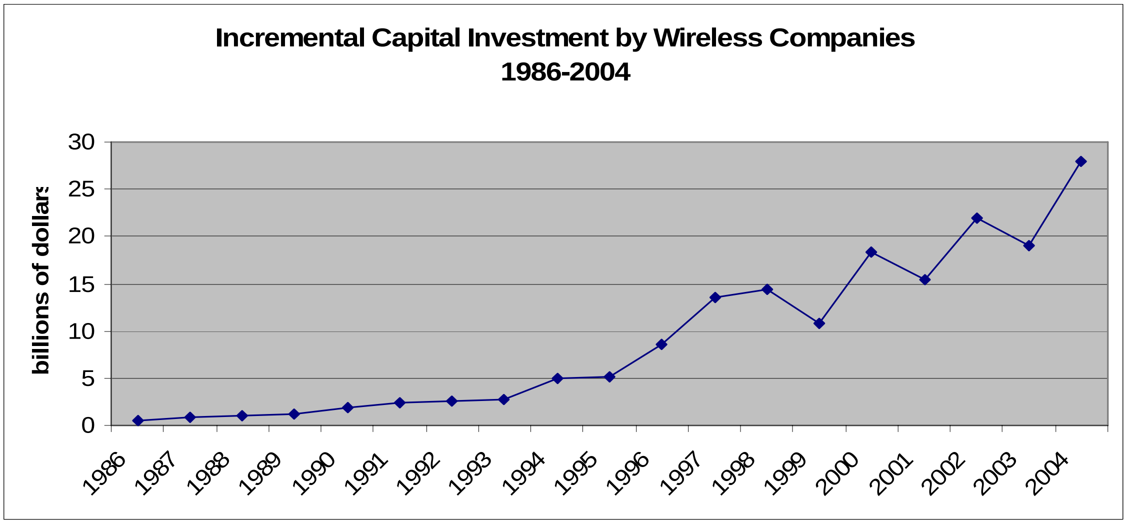
useful to enter a deal that allows it to differentiate itself from other wireless providers. Firms try to differentiate themselves in many ways: price, quality reputation, home market coverage, special pricing for nights and weekends, and roaming territory and roaming rates. Such product differentiation can be beneficial to consumers as firms compete to expand their offerings in ways that consumers demand. Exclusive deals are common in the market economy and usually have efficiency enhancing reasons and outcomes.

39. Not surprisingly, because of the increase in territory covered by nationwide firms directly and through their relationships with affiliates and strategic roaming partners, they may be less likely to use the roaming services offered by independent firms and value them less highly.

D. Investment incentives

40. Figure 4 shows that wireless firms have invested tens of billions of dollars in national networks and upgraded technology in response to consumer demand. This massive investment that has provided extensive coverage and increased access to advanced services has occurred under the current regime with no mandatory roaming rule. A mandatory roaming rule could reduce investment and slow the growth of efficient competitive networks; in fact, a rule could reduce investment incentives by both suppliers and demanders of roaming services.

Figure 4



Source: Derived from CTIA'S Wireless Industry Indices, Semi-Annual Data Survey Results, Year-end 2004 Results, Released June 2005, Table 77. Note again, the data are subject to variation due to reporting differentials year to year so should not be used to determine actual incremental investment in any year, but rather to give the general trend and magnitude of wireless network investment.

41. First, guaranteeing access to roaming networks at below market rates would reduce a firm's incentive to build its own facilities. Without such guaranteed access a company considering contracting for roaming services for its customers might increase its own investment and reduce its demand for roaming if prices for roaming were too high. Indeed, this is one reason why firms have invested so aggressively to provide seamless coverage.

42. Second, forcing a firm to share access to its infrastructure can reduce the returns to that investment. Reduced returns to investment in infrastructure may cause the firm to reduce its investment. Indeed, in its most recent Triennial Review Order, the Commission recognized that forced access can significantly reduce incentives to invest, and should be used only where there is true impairment.[32] In contrast, as discussed above, because wireless is a competitive market with no monopoly

[32] Order on Remand In the Matter of Unbundled Access to Network Elements Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers, Rel. February 4, 2005, paras 2-3.

provider, roaming involves no such bottleneck or impairment; the competitive CMRS marketplace has multiple networks and firms also have the ability to invest in their own networks.

43. Third, if a firm were required to share its facilities and grant access to new services, it will have less incentive to innovate. The ability to exclude competitors from the fruits of one's investment is an important part of the competitive marketplace. Without such an ability, firms would have an incentive to wait for their rivals to invest and then to mimic the services (and to free ride on the investment risk). Not only is this an important piece of the competitive process, it is not a very controversial point in the context of a competitive market like wireless communications.

E. Artificial entry barriers that block competition might justify targeted regulation

44. Economic regulation should mitigate market failures. As discussed above, the CMRS market is competitive and a general mandatory roaming rule is likely to be inefficient and harm consumers. However, certain artificial barriers to entry in some places might impede the competitive market. Targeted regulation may be able to help alleviate these inefficiencies.

45. In particular, there may be areas where a large property owner (public or private) allows only a single wireless provider to operate. In such cases, the best alternative would not be to institute a roaming rule, but instead to prevail upon the property owner to cease granting exclusive access and allow multiple carriers to operate service in the area. In the absence of the ability to convince such entities to cease creating artificial scarcity and harming consumers, however, there may be room for a

roaming rule. But this is a very narrow circumstance where the competition evident in the general wireless marketplace is not allowed to play out.

IV. The Outcomes of Roaming Negotiations are Consistent with a Competitive Marketplace

46. The CMRS marketplace is competitive and firms do not have the incentive or ability to harm consumers by increasing roaming rates arbitrarily. Indeed, some small carriers complain that roaming prices are too low.[33] The rich variety of roaming agreements that exists in the market is consistent with outcomes that normally arise in competitive markets throughout the economy. In a competitive marketplace with product differentiation, it would be surprising to see all agreements be identical.

47. NTCA appears to complain about reduced roaming traffic (and reduced roaming revenue) and asymmetric roaming rates. The reduced roaming traffic and revenue on specific networks is a sign that competition is working. Reduced traffic on some networks likely reflects a diversion of traffic from systems that at one time had market power to competitive systems and increased buildout. Asymmetric roaming rates are not surprising either.

48. Firms position themselves to be able to enter into favorable deals by investing and making sure they have competitive options. Sprint, for example, provides service for its customers in several ways when its customers leave their home regions.

49. In some markets Sprint owns spectrum and contracts with affiliates who provide and operate networks (in accord with standards established by Sprint) using Sprint's

[33] NTCA Comments In the Matter of WTB Seeks Comment on CMRS Competition, Docket No. 05-71, page 5. March 28, 2005.

spectrum. In these markets, Sprint and its affiliates negotiate deals so that the traveling customer sees no difference in service – she pays no additional charges for using service in an affiliate's territory and can generally use all of the advanced services Sprint offers. The reverse is also true –an affiliate's customer has a seamless experience when traveling on the Sprint network. Sprint pays the affiliates when customers from Sprint's network use the affiliates' networks and the affiliates pay Sprint for use of the Sprint network.

50. Over the past five years, Sprint and its affiliates have invested billions of dollars to expand their CDMA network to cover an additional 60 million people (POPs) or roughly an additional 20 percent of the population of the country. They also invested heavily to expand and enhance iDEN coverage during this period of time. Sprint's own network expansion has reduced its demand for roaming services while at the same time making it more attractive as a roaming provider.

51. In other markets Sprint provides service for customers traveling outside of its service area via roaming agreements with unaffiliated third parties, who provide the spectrum and facilities. Sprint has signed such roaming agreements with Strategic Roaming Alliance (SRA) partners like Nex-Tech Wireless, Pioneer and United Wireless.

A. Roaming price is comprised of a number of factors

52. Roaming agreements, like any economic relationship, should make both parties better off (or at least leave no party worse off). The home provider benefits by increasing the geographic scope of its service. The provider hosting the roaming services benefits by selling capacity on its network. To the extent that "inbound roaming" is profitable, the host has an incentive to encourage inbound roaming.

53. These roaming agreements involve a number of parameters, and negotiated prices will depend on those parameters. For example, access to a small network or to a carrier in an area where other carriers also offer roaming may not be especially valuable. A carrier owning such a network may therefore be unable to charge a high price for roaming because the other carrier may be able to negotiate with other carriers, build its own facilities, or even do without access in the area. On the other hand, access to a vast nationwide network on which the operator has spent billions of dollars might be very valuable. A carrier offering a small network and a carrier offering a national network may indeed enter into a roaming agreement, but, as discussed below, there is no particular economic reason to believe that the roaming rates should by symmetric. The value of a network covering one million POPs is not the same as that of a network covering 250 million POPs.

54. Sprint and the other nationwide carriers have not only invested billions of dollars in spectrum and network buildout, but also in developing reputations for quality service. One important feature of bilateral roaming arrangements where customers roam on each other's network is ensuring that the other carrier maintains a certain level of quality and, in some cases, like with Sprint's affiliate and SRA partners, seamless use of the advanced network features. To the extent possible, Sprint wants its customers to have access to all of its features and functionalities.

55. The region in which roaming services are being purchased will also affect prices. Fundamentally, buying roaming services is buying access to a wireless network, including use of spectrum, in a specific region. However, regions are not equal. FCC spectrum auctions demonstrate that some areas are more valuable than others, even

on a per pop basis. For example, in the latest broadband PCS auction, auction number 58, the 10 licenses with the highest $/MHz-pop bids all had populations of over 1 million people. In contrast, the twenty-five licenses that received no bids in the auction all had populations below 610,000 and the majority below 100,000 people.[34] It would be sensible, then, if firms were not only willing to pay more for operating licenses in these regions but also if firms were willing to pay more to allow their customers to roam in these areas.

56. Roaming prices that get negotiated between carriers depend on a number of different factors. Because these differ in each negotiation, it is not surprising that there will be different prices for what appear superficially to be similar services.

B. Volume and term commitments

57. Price reductions in connection with volume and term commitments are typical in the economy. Because of the fixed costs of entering and setting up arrangements and the ability to plan network usage and because of the certainty of longer term investments, a firm may be more willing to offer lower prices to firms with higher volumes and longer term commitments.

58. Because of this, two larger wireless carriers may be willing to offer each other a lower price than they would offer to a smaller carrier. It is my understanding that some roaming agreements provide a lower price as the volume of minutes increases which is consistent with the competitive incentives inherent in the economics of roaming.

[34] Data for Auction 58 is available from the FCC website at http://wireless.fcc.gov/auctions/default.htm?job=auction_summary&id=58.

C. Asymmetrical agreements

59. RTG is concerned that large carriers may demand asymmetric rates, where the rural firm pays more for its customers to roam on the large carriers' network than vice-versa. [35] It is understandable that some carriers are upset at this situation. However, asymmetric rates can easily be a natural result of competition that has benefited consumers; at the same time, competitive roaming can be unfavorable to specific firms that do not have a valuable roaming product to sell. As is well known, appropriate public policy should protect competition, not competitors and especially not competitors from low prices that benefit consumers.[36]

60. One-way and two-way roaming deals differ fundamentally. In a two-way deal, the firms act as both buyers and sellers at the same time. A firm that is buying roaming services from another carrier may get a much better deal if in addition it is also providing roaming services to the other company. If a firm does not need roaming services from another provider because it already has roaming coverage or has invested in its own infrastructure, it may not see as much benefit from entering into a roaming deal. The firm that is simply buying roaming services would not be providing the additional benefits that come from a two-way deal, and it may need to pay a substantially higher roaming price to offset the lack of reciprocal benefits.

61. The Internet is widely recognized as competitive and Internet backbone providers enter into different types of agreements with different providers. Many Internet

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[35] Roaming NPRM, para 17.

[36] *See* eg. AT&T /Cingular merger order, para 172 "In evaluating the impact of the proposed merger on roaming services, we focus on the potential harm to consumers of mobile telephony services, rather than to mobile telephony providers."

backbone providers, for example, enter into "peering" arrangements with each other, but are not always willing to enter into such arrangements with other providers. Under peering arrangements the firms do not pay each other to exchange data traffic. A key to peering agreements is that the networks exchange approximately similar amounts of traffic in similar geographic scope, making it generally not cost-effective to bill each other.[37]

62. Other, generally smaller, firms purchase "transit" access from larger providers. While these smaller firms would, like anyone, prefer paying a price of zero for the connection, it doesn't make economic sense. The smaller provider might provide traffic in only one direction or might cover only a small portion of the country. A web hosting company, for example, will send more data out than it receives, resulting in traffic imbalances. A local company without nationwide or worldwide presence could impose significant costs on the other network because of the standard of "hot potato" routing where traffic is handed off to other network at the first possible point.

63. Decisions regarding transit and peering are set in a competitive market, where each firm brings different features to the negotiating table. The key lesson from the competitive Internet backbone interconnection is that because some firms have peering arrangements and other firms operate with transit does not necessarily imply a market failure. Likewise, the presence of many different types of roaming agreements is not a market failure or the result of anticompetitive exercise of market

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[37] MCI posts its requirements for peering on its website, www.mci.com/peering. Those requirements include minimum standards for geographic coverage, network quality and balanced traffic, among other things.

power. Instead, it is consistent with the smooth workings of the market and appropriate responses to market incentives.

64. Essentially, the simple analogy is that different products and services have different value. Because the supply and demand for roaming services differ in different areas, one should expect different prices in different areas. Prices for identical houses, food, and services differ in different geographic areas. Roaming service is no different.

65. Simple evidence of asymmetric deals or differential pricing arising should not lead directly to the conclusion that a new rule is necessary or that a rule would even benefit consumers. These differences are entirely consistent with the operations of a competitive market and in that case intervention might serve to benefit some companies yet cost consumers dearly.

V. Economic analysis of a "duty to deal"

66. A mandatory roaming rule is, at its core, an order for firms to help their competitors at a price below which they would agree to do so willingly. In competitive markets firms are not generally required to aid their rivals. Dell is not required to share its highly efficient production methods with Hewlett Packard, nor are UPS and FedEx required to share airplanes, trucks, or software with each other or with other firms hoping to enter the overnight delivery market. Any requirement to share, especially at below market rates, would substantially reduce their incentives to invest and improve their products and should only be undertaken in rare circumstances. Even if a company possesses an "essential facility" (which is clearly not the case in wireless), there can be detrimental incentive effect from mandated sharing.

67. Mandating the sharing of resources at regulated prices should be implemented only if careful analysis reveals that the market cannot function without it and when refusal to cooperate harms consumers. The United States Department of Justice noted recently that "In the context of an alleged refusal to assist a rival, conduct is exclusionary only if it would not make business or economic sense apart from its tendency to reduce or eliminate competition."[38] There is no such evidence in the wireless market; to the contrary, in a competitive market like wireless, there is no ability to reduce or eliminate competition.

68. Congress and the FCC mandated sharing of resources in the implementation of the Telecommunications Act of 1996 – but on incumbent LECs only, because of their market power. The difficulty the FCC and the Courts have had over the past decade in determining how to implement this feature of the Act – when is it necessary and the correct price – should give pause to the Commission in thinking about instituting a roaming rule where the conditions are substantially more competitive than they were for wireline service when the FCC started down that path.

69. Some economists argue that the mandated sharing for unbundled network elements had a deleterious effect on investment. They argue that both the incumbent firms and the new entrants invested less because of the "duty to deal."[39] In a market with a very competitive structure, the duty to deal could have much more negative effects

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[38] Verizon Communications Inc. Petitioner *v.* Law Offices of Curtis V. Trinko, LLP, Brief for the United States and the Federal Trade Commission as Amici Curiae Supporting Petitioner available at http://www.usdoj.gov/atr/cases/f201000/201048.pdf.

[39] *See eg.* Crandall, R. Competition and Chaos: U.S. Telecommunications Since the 1996 Telecom Act, Brookings Institution Press: Washington, DC, 2005, and Hazlett, T. (2005). "Rivalrous Telecommunications Networks With and Without Mandatory Sharing." AEI-Brookings Joint Center for Regulatory Studies Working Paper: Washington, DC.

without any offsetting positive benefits. At the extreme, in a perfectly competitive market, no firm would invest at all with such a requirement because the firm would bear the cost and risk of the investment while its competitors enjoyed the returns. When necessary, rather than paying the market price for use of that investment, a rival could simply demand access at below cost regulated rates. (Unless, of course, the regulator set price at or above the market price, but then the regulation's only impact would be to impose implementation costs).

70. A duty to deal may not only deter investment, but, in some circumstances, also lead to non-economic investment. There may be cases where the additional traffic from roaming partners requires the addition of capacity in high traffic areas. The cost of the additional capacity may be very high in some areas and not justify the low revenues from mandated roaming rates. However, in order to ensure high quality service for its own customer, the carrier might be forced to invest in additional non-remunerative capacity simply to serve roamers.[40]

VI. Economic problems with implementation of a roaming rule

71. Instituting a rule that simply decreed that carriers have a duty to enter into roaming arrangements would not work. The Commission, as it well knows, would have to institute a process for dispute resolution as well. The process could be complicated, time-consuming, and in the end, arbitrary. In this section, I identify a few of the more obvious problems that are likely to arise in implementing such a decree. There are likely to be others.

[40] The current AMPS rule, for example, requires carriers to provide sufficient capacity to serve roamers. 47 CFR Section 22.901 (b)(2).

72. It is my understanding that Section 208 already governs, to some extent, relations between wireless carriers. This proceeding is considering additional regulation and obligations. I do not address the Section 208 obligations, but instead focus on what appears to be at issue here – the mandate that carriers somehow enter into roaming agreements when one party desires such an arrangement while the other party does not (at least not on the terms proposed by the party desiring the arrangement).

A. Price determination is difficult

73. A mandatory roaming rule will ultimately require the Commission to decide on an appropriate roaming price. If there is a mandate to offer roaming services without a mandate on price, the carrier being forced into negotiations could simply set a very high price. It would have complied with the duty to enter into negotiations and make an offer at which it would be willing to provide roaming services. But given the high price, the two firms may not come to an agreement.

74. I assume that under the framework of a roaming rule, the requesting carrier would then ask the Commission to force the other carrier to offer a lower price. The Commission would then have to determine the appropriate price for roaming services in the area. But, as discussed above, a large number of factors might go into the determination of the price – Does the requesting company provide any benefits to the other carrier? Where are their customers expected to roam? What volume of customers could they bring to the carrier? Would providing roaming services harm the carrier because of its inability to differentiate its service? The Commission would have to answer all of these questions – and many more – in order to come up with a fair, competitive answer to the question of what price should be charged.

B. Determination of “similarly situated” is extremely difficult

75. RTG argues that some carriers get different deals than others. Again, that is not surprising in a competitive market. But RTG seems to argue that large carriers will give each other “sweetheart” deals that are not available to others.

76. Not all carriers can or should have access to the same deals, because of all of the differences discussed above. At a minimum, RTG appears to want a rule that would allow “similarly situated” carriers to have access to the same terms and conditions.

77. Such a rule, like the pricing problem, would require an arbiter to review all of a carrier’s agreements to determine which other roaming partners were “similarly situated.” Again, a carrier could demand a deal from another carrier and be unhappy with the terms offered. The next step would be to go to the Commission to have the dispute resolved. The arbiter would have to make a determination of whether the two were “close enough.” Such determinations are unlikely to provide much information for future deals so the process is unlikely to be a one shot deal, but much more likely to lead to continuing debates about the ability of a carrier to enter into deals.

C. FCC’s most favored nation clause

78. In the NPRM, the FCC asks about a most favored nation policy alternative that would require carriers to “make their networks available to all roaming partners on the same terms and conditions as they offer to their ‘most favored’ roaming partners.”[41] Implementing this proposal would create perverse incentives and could lead to substantially higher prices for consumers. This avoids the problems of determining

[41] Roaming NPRM para. 42.

what carriers are similarly situated discussed in the section above, but at the cost of introducing a host of other concerns.

79. Again, RTG accuses national wireless firms of entering into so-called “sweetheart” deals with each other. In other words, the RTG appears to be upset that the vast majority of wireless subscribers are now benefiting from lower prices. As discussed above, two firms with a large subscriber base and wide geographic coverage are likely to agree to low roaming rates because each would like to provide its customers access the other’s territory and provide roaming service to the other’s customers. While it is understandable that small carriers, like everyone else, would like lower prices, there is no economic reason why a negotiation between a firm with national coverage and large subscriber base and a firm with limited coverage and few subscribers would yield the same result. Volume and geographic coverage matter, especially in two-way roaming arrangements.

80. In addition to the lack of economic justification for such a ‘most favored’ roaming partner rule, such a rule could, paradoxically, significantly increase prices.

81. Currently, firms have an incentive to negotiate the lowest roaming rates possible for their customers. A ‘most favored’ roaming partner rule could significantly change those incentives. In a paper that I co-authored while serving as the Deputy Chief Economist of the FCC, we noted that two firms might set artificially high interconnection prices as a mechanism for facilitating and enforcing higher prices.[42]

[42] Katz, M., G. Rosston, and J. Anspacher, (1995) “Interconnecting Interoperable Systems: The Regulators' Perspective.” *Information, Infrastructure and Policy*.

A ‘most favored’ roaming partner rule could have a similar effect, creating the ability to “raise rivals’ costs.”

82. Firms currently have an incentive to bargain for low roaming prices to compete in the marketplace for customers on the basis of low roaming rates. But, if two parties have relatively balanced outbound and inbound roaming traffic, instead of negotiating a low price that would benefit consumers, they could negotiate a high price to ensure that their rivals would face a high price for their roaming. The high price would not affect carriers with balanced traffic (assuming the marginal incentives for consumers were small) and they then could tell other firms who are unlikely to have balanced traffic that the high price is the legally mandated minimum. In addition, neither of the two parties to the original deal would have the ability to compete to sign a better roaming deal with other carriers because it would then be subject to a rewrite of one side of the original roaming deal.

D. Technological change needs to be addressed

83. In competitive markets, firms make their own decisions about when to upgrade technology. It is imaginable that if a carrier were to change its wireless technology, that its roaming partners would have to change technology as well. For example, about five years ago, most of Sprint’s outbound roaming used analog AMPS technology. Today, Sprint’s customers still roam on AMPS in some places (and Sprint provides dual mode, dual band CDMA/AMPS phones to most of its customers). The cellular AMPS requirement sunsets in 2008. At that point in time, the AMPS carriers will have the choice of whether to discontinue AMPS service. Sprint has prepared for the eventual elimination of AMPS service and worked on

solutions to provide coverage for its customers – it has entered into a variety of roaming deals, built out substantial additional territory itself, provided multimode handsets to enable CDMA roaming on 800 MHz frequencies. In some cases, it might suffer the consequences of less coverage. All of these are activities consistent with a firm in a competitive market undertaking actions to serve and retain customers.

VII. Loss of roaming revenue for small carriers

A. If the FCC takes this problem seriously, it should be dealt with directly rather than in a roundabout way with a roaming rule.

84. The NPRM asks for comments on the concerns of small and rural carriers that they have been losing roaming traffic and revenue. [43] As shown in Figure 2, roaming prices have declined substantially on a per minute basis. Reductions in roaming revenues are bad for the firms that historically charged high roaming prices and relied heavily on roaming fees to run their networks. If the Commission wants to ensure that these rural cellular phone companies are able to maintain supracompetitive revenues, then the Commission should develop an explicit mechanism to do so and not distort the market by instituting a roaming rule.[44] A roaming rule would be a highly inefficient mechanism for guaranteeing a source of revenues for rural carriers

[43] Roaming NPRM para. 41.

[44] Even dealing with this directly by providing money to the carriers would be a poor public policy choice – use of the competitive market to ensure efficient production with narrow targeted subsidies to consumers would be a much better public policy choice. (See Hundt. R. and Rosston, G. Telecommunications Policy for 2006 and Beyond, Federal Communications Law Journal, *Forthcoming* December 2005 Vol 58, No. ,1 available at http://siepr.stanford.edu/papers/discussion_papers_index.html). In this way, the carriers would survive if they provided services customers desired.

since it would only be peripherally related to the alleged problem it would be intended to rectify.

B. Firms lose revenue all the time in competitive market

85. Rural cellular firms allege they are losing roaming traffic because of anticompetitive use of market power by larger firms.[45] If rural firms are losing roaming revenues, however, it is primarily because other carriers now have competitive alternatives that did not exist in the past. The competitive alternatives affect the incumbent rural carriers in two ways – the loss of minutes to their competitors and a reduction in the price per minute for the remaining minutes. While this outcome may not be good for the rural carrier, it is good for consumers. This is the nature of competition. As discussed above, rural carriers used to charge very high rates for roaming when they were one of two potential roaming partners. Once carriers had a larger number of carriers with whom to make roaming agreements and the ability to build their own facilities if they chose, legacy rural carriers could no longer charge supra-competitive prices. Instead of paying high roaming rates to unaffiliated rural cellular providers, carriers began to invest in their own networks and in deals with dedicated roaming partners who would not take advantage of them and their customers.

86. Just as the Commission hoped when it opened the mobile market to additional competition from PCS and ESMR, firms have entered the market. This has been a classic Economics 1 story. Prices for both home service and roaming were high through the early 1990s. With the PCS auctions and the upgrade of analog SMR

[45] Roaming NPRM, para. 17.

channels to wide area digital service, competition from the new entrants has driven all rates down. Since prices are now more closely aligned with marginal costs, society's resources are allocated more efficiently and consumers benefit from the lower prices. As discussed above, a mandated roaming rule would blunt the incentives to enter and reduce prices and would be antithetical to the Commission's duty. Getting in the way of competition that benefits consumers is exactly the wrong type of public policy to implement.

C. The Tier IV Category is poorly thought out

87. The FCC asks for comments on RTG's suggestion of the creation of "Tier IV" CMRS carriers consisting solely of CMRS carriers with fewer than 100,000 customers. [46] Under RTG's proposal, Tier IV providers would be entitled to automatic roaming in rural markets at symmetric rates. RTG's proposal provides no economic background or justification.[47] Even cursory analysis of this proposal reveals its many flaws for consumers and competition and highlights the fact that its goal is simply to protect a small, specific group of carriers.

88. First, there is no economic rational for setting the Tier IV level at not more than 100,000 customers. Adopting any (arbitrary) fixed number will create incentive problems. A firm with 99,000 customers, for example, may not want to add an additional 1,000 customers since it would then lose its government-protected Tier IV status. Many efficiency enhancing combinations might be frustrated by such an arbitrary and fixed rule. For example, wireless service and competition improved as

[46] Roaming NPRM para. 43.

[47] RTG *Ex Parte* in WT Docket No. 00-193, filed June 28, 2005.

companies like Western Wireless, McCaw and others acquired multiple systems and operated them jointly more efficiently than they had operated as separate entities. If such acquisitions were penalized through the loss of government mandated handout, then companies would be less likely to undertake such transactions and consumers would suffer. In other words, setting any arbitrary level for cutting off government or regulatory benefits creates incentives not to exceed that level.

89. Second, it appears that not only would the proposal carve out a special group, it also would mandate symmetrical rates for this group. As discussed above mandating symmetric rates is problematic for a variety of reasons. In addition, it appears that this might also come with an argument to try to force larger carriers to direct their roaming traffic to the Type IV carriers even when that would be inefficient or contrary to consumers' interests.

90. Finally, there is no rational economic reason to single out one group of carriers for special treatment when other carriers in the market have the same access to roaming markets. There is no market failure identified here – the only problem appears to be that the smaller carriers think that it is cheaper to get special treatment and roaming agreements from the Commission than by providing valuable services and paying for valuable services in the marketplace.

VIII. Conclusion

91. Economic analysis reveals no need for the Commission to mandate a roaming rule at this point in time. Vigorous competition is the best protection consumers can hope for and consumers have benefited from it tremendously: prices have come down

dramatically, coverage has increased, and operators are rolling out advanced services. This has all occurred continuously over the past ten years without any roaming rule.

92. Some firms have been hurt by the vigorous competition and have come to complain to the Commission. But since there is no market failure evident, it would be folly to try to make a correction. The only likely beneficiaries of such a rule would be firms that have been hurt by competition. There is no evidence that any of the proposed rules would help consumers in any way. Indeed, these rules could paradoxically harm consumers by increasing costs and reducing investment incentives. While a mandatory roaming rule may be in the private interest of certain firms, the public interest demands that the Commission not interfere with efficient workings of a highly successful, competitive market.

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Papers and Publications

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"Competition in Local Telecommunications: Implications of Unbundling for Antitrust Policy" in Brock, G., (ed.) Toward a Competitive Telecommunication Industry: Selected Papers from the 1994 Telecommunications Policy Research Conference, LEA Associates, Mahwah, NJ. 1995 (with Harris, R. and Teece, D.).

"Competition and 'Local' Communications: Innovation, Entry and Integration," *Journal of Industrial and Corporate Change*. 1995 (with Teece, D.).

"Spectrum Flexibility will Promote Competition and the Public Interest," *IEEE Communications Magazine*, December, 1995 pp 2-5. (with Hundt, R.).

"Interconnecting Interoperable Systems: The Regulators' Perspective." *Information, Infrastructure and Policy*. 1995 (with Katz, M., and Anspacher, J.).

"Everything You Need To Know About Spectrum Auctions, But Didn't Think To Ask," *Washington Telecom News*, Vol. 4, No. 5. February 5, 1996 p-5. (with Hundt, R.).

The Internet and Telecommunications Policy: Selected Papers from the 1995 Telecommunications Policy Research Conference, LEA Associates, Mahwah, NJ. 1996 (ed. with Brock, G.).

"Introduction," in Brock, G., and Rosston, G., (ed.s) (1996) The Internet and Telecommunications Policy: Selected Papers from the 1995 Telecommunications Policy Research Conference, LEA Associates, Mahwah, NJ. 1996 (with Brock, G.).

"Competition and 'Local' Communications: Innovation, Entry and Integration," in Noam, E., (ed.) The End of Territoriality in Communications: Globalism and Localism, Elsevier. 1997 (with Teece, D.).

"Using Market-Based Spectrum Policy to Promote the Public Interest," FCC Staff Paper, 1997. Also published in *Federal Communications Law Journal*, Vol. 50, No. 1. 1997 (with Steinberg, J.).

"A New Spectrum Policy: Letting the Market Work" *Radio Communication Reports*, March 3, 1997, pp 59-64.

"The Telecommunications Act Trilogy," *Media Law and Policy* . Vol V, No. 2 Winter 1997, pp 1-12.

"Interconnection and Competition Policy," *Cable TV and New Media*. Vol XV, No. 3 May, 1997, pp 1-4.

"Pricing Principles to Advance Telephone Competition," *Cable TV and New Media*. Vol XV, No. 4 June, 1997, pp 1-3.

Interconnection and The Internet: Selected Papers from the 1996 Telecommunications Policy Research Conference, LEA Associates, Mahwah, NJ. 1997 (ed. with Waterman, D.).

"Introduction," in Waterman, D., and Rosston, G., (ed.s) (1997) Interconnection and The Internet: Selected Papers from the 1996 Telecommunications Policy Research Conference, LEA Associates, Mahwah, NJ. 1997 (with Waterman, D.).

"Comment on the Value of New Services in Telecommunications" *Brookings Papers on Microeconomic Activity--Microeconomics*, 1997.

"Universal Service Reform: An Economist's Perspective," *Cable TV and New Media.* Vol XV No. 11, January, 1998, pp 1-4.

"Alternative Paths to Broadband Deployment," *IEEE Communications Magazine*, July, 1998 pp 2-4. (with Hundt, R.).

"An Insiders' View of FCC Spectrum Auctions," Stanford Institute for Economic Policy Research Discussion Paper No. 98-2, February, 1999. *Journal of Regulatory Economics*, Vol 17, No. 3, 253-289, 2000 (with Kwerel, E.).

"The High Cost of Universal Service," *CCH Power and Telecom Law*, January-February 1999 (with Wimmer, B.).

"Effects of Unbundling Proposals on Cable Investment Incentives," *The Party Line, Newsletter of the Communications Industry Committee, American Bar Association Section of Antitrust Law*, March 1999 (with Owen. B.)

"The ABC's of Universal Service: Arbitrage, Big Bucks and Competition," Stanford Institute for Economic Policy Research discussion Paper No. 98-4, April, 1999. Hastings Law Journal, Vol. 50, No. 6, August 1999 (with Wimmer, B.).

"Winners and Losers from the Universal Service Subsidy Battle," Stanford Institute for Economic Policy Research Working Paper No. 99-8, December, 1999. Published in Vogelsang, I. and Compaine, B. (ed.s) The Internet Upheaval: Raising Questions, Seeking Answers in Communications Policy, Cambridge, MA: MIT Press, 2000 (with Wimmer, B.).

"The 'State' of Universal Service," Stanford Institute for Economic Policy Research Discussion Paper No. 99-18, April 2000. *Information, Economics and Policy*, Vol. 12, No. 3. 261-283, September 2000 (with Wimmer, B.).

"From C to Shining C: Competition and Cross-Subsidy in Communications," Stanford Institute for Economic Policy Research Discussion Paper No. 00-21, October 2000. in Compaine, B. and Greenstein, S. (ed.s) Communications Policy in Transition: The Internet and Beyond. Selected Papers from the 2000 Telecommunications Policy Research Conference, Cambridge, MA: MIT Press, 2001 (with Wimmer, B.).

"Universal Service, Competition and Economic Growth: The Case of the Hidden Subsidy," April 2001 in Dossani, R. (ed.) Reforms in the Telecommunications Sector in India, Greenwood Press (with Wimmer, B.).

"The Digital Divide: Definitions, Measurement, and Policy Issues," in Bridging the Digital Divide, California Council on Science and Technology, May 2001 (with Noll, R., Older-Aguilar, D. and Ross, R.).

"The Long and Winding Road: The FCC Paves the Path with Good Intentions," Stanford Institute for Economic Policy Research Discussion Paper No. 01-08, November 2001. *Telecommunications Policy,* Vol. 27, No. 7. 501 – 515, August 2003.

"Spectrum Allocation and the Internet," Stanford Institute for Economic Policy Research Discussion Paper No. 01-09, December 2001. in Cyber Policy and Economics in an Internet Age, Lehr W. and Pupillo, L. (ed.s) , Kluwer Academic Publishers, New York, 2002. (with Owen. B.).

"The Economics of the Supreme Court's Decision On Forward Looking Costs," *Review of Network Economics*, September, 2002 Vol. 1, No. 2, September 2002 Stanford Institute for Economic Policy Research Discussion Paper No. 01-031 (with Noll, R.)

"Local Broadband Access: Primum Non Nocere or Primum Processi? A Property Rights Approach," Stanford Institute for Economic Policy Research Discussion Paper No. 02-37, July 2003 (with Owen, B.)

"A Losing Battle for All Sides: The Sad State of Spectrum Management" *Federal Communications Law Journal*, Vol. 56 No. 2, March 2004.

Review of *The Second Information Revolution.* by Gerald W. Brock, *Journal of Economic Literature*, Vol. XLII, June, 2004 pp 1157-1158

"Local Telephone Rate Structures Before and After the Act," *Information, Economics and Policy* , Vol 17, No. 1. pp 13-34, January 2005 Stanford Institute for Economic Policy Research Discussion Paper No. 01-030, August 2002 (with Wimmer, B.).

"Communications Policy for 2005 and Beyond," 2005 Stanford Institute for Economic Policy Research Discussion Paper No. 04-07, August 2002 (with Hundt, R.) *Forthcoming* in *Federal Communications Law Journal*, Vol. 58 No. 1, December 2005.

Policy Briefs and Opinion Pieces

"On the Record: Former FCC Economist Backs Universal Service Alternative," *Telecommunications Reports*, Vol. 63, No. 51. December 22, 1997, pp 51-53.

"The Future of Wireless" Stanford Institute for Economic Policy Research *Policy Brief*, May 2001.

"Politics Lands Bush in High Price Lane," *Los Angeles Times*, June 15, 2001.

"Antitrust Implications of EchoStar-DirecTV Proposed Merger, " Stanford Institute for Economic Policy Research *Policy Brief*, November 2001.

"Supreme Court Decision Regarding the FCC Implementation of the Telecommunications Act of 1996," Stanford Institute for Economic Policy Research *Policy Brief*, May 2002 (with Noll, R.).

"The FCC Spectrum Policy Task Force Report: A Very Small Step,"

"The FCC and Local Competition," Stanford Institute for Economic Policy Research *Policy Brief*, April 2003.

"Why Airwaves Should be Deregulated," *CNET.com*, February 11, 2004.

"Broadband Users, Watch your Wallets" *CNET.com*, April 27, 2004.

"The Next Phase of the Electronic Highway: Universal broadband -- Big bucks beyond the vision" *San Francisco Chronicle*, April 30, 2004.

"Cheap Net Phones Face the Threat of a Tax Hangup," *San Jose Mercury News*, June 17, 2004.

"For Whom the Bridge Tolls" *San Francisco Chronicle*, August 27, 2004

"Writing the Right Ending to the MCI Saga," *CNET.com* April 5, 2005

"Traffic Congestion, Congestion Pricing and the Price of Using California's Freeways" Stanford Institute for Economic Policy Research *Policy Brief*, April 2005.

Other Professional Activities

Referee for *American Economic Review*, *Rand Journal of Economics*, *Industrial and Corporate Change*, *Journal of Industrial Economics*, *Telecommunication Systems*, *Journal of Economics and Management Science*, *Antitrust Law Journal*.

FCC Economist Panel Hearing on the Economics of Interconnection, May, 1996.
FCC Economist Panel Hearing on the Economics of RBOC Entry under Section 271, July, 1996.
FCC Economist Panel Hearing on Competitive Bidding for Universal Service Provision, March, 1997.
Consultant for the World Bank on Telecommunications Policy in Hungary, 1998.
FCC Academic Expert Panel on "A New FCC for the 21st Century," June 1999.
FCC Academic Expert Panel on AT&T—MediaOne Merger, February, 2000.
FCC Panel on Wireless Competition, February 2002.
FCC Workshop on Spectrum Policy, July 2002.
San Francisco Telecommunications Commission on Cable Competition, January 2003.
U.S. Senate Commerce Committee on Spectrum Policy, March 2003.
California State Senate Committee on Banking, Commerce and International Trade on the Economic Effects of Media Consolidation, March 2003.
Telecommunications Policy Research Conference, Program Committee 2002-2004
Bay Area Economic Profile Academic Review Panel, 2003-2004
National Research Council Committee on *Wireless Technology Prospects and Policy*, 2003-2004.
San Francisco City Board of Supervisors Land Use Committee on Cable Competition, July 2004.

Awards

Chairman's Distinguished Service Award, FCC, 1997.
University of California, Brad King Award for Young Alumni Service, 1994.
National Performance Review Hammer Award for Reinventing Government, 1994.
Telecommunications Policy Research Conference Graduate Student Paper Competition, 2nd Place, 1994.
John M. Olin Foundation Fellowship, 1989-1990.
Charles Mills Gayley Fellowship, 1985.
Stanford University Fellowship, 1984-1985.