

Open Access for the 700 MHz Auction

WHOLESALE ACCESS LICENSING PROMOTES COMPETITION AND COULD INCREASE AUCTION REVENUE

By Simon Wilkie*

Overview

In this report, I analyze the competitive effects of recent proposals to reserve a small portion of the upcoming 700 MHz band auction for wholesale, open-access use.¹ Using this license, a wholesale open-access licensee would build out the wireless network, own and operate the cell sites, towers, and radio equipment, and provide transport to the Internet backbone. For the purposes of this report, “open access” means that there would be “no locking and no blocking” by the network operator. That is, there would be no prohibitions against devices that may be connected to the network so long as the devices are compatible with, and do not harm, the network (i.e., no “locking”), and there would be no restrictions against content, applications, or services that may be accessed over the network (i.e., no “blocking”). Verizon’s decision to reject Apple’s iPhone is a recent example of locking, and its prohibitions against video streaming, peer-to-peer file sharing, and other applications are examples of blocking.²

Several of the open-access proposals also propose a “no-retail” rule, which means that the licensee will not offer any retail services to end users but will provide basic transport capacity to unaffiliated retail service providers on a non-discriminatory basis.³ These retail service providers would then supply services, such as mobile Internet access and device connectivity, to end users.⁴ The no-retail rule effectively separates the operation of the transport network from the provision of retail services, ensuring that the operator of the transport network will not compete directly in the provision of retail services. When the operator of the transport network is a pure wholesale provider that is not affiliated in any way with a retail service provider, the disassociation of transport from retail services will promote competition and benefit consumers. Instead of one integrated and closed retail provider, under open access a number of competing retail providers lease capacity from the open wholesale network. If the operator of the transport network were affiliated with a retail provider, however, the separation between network operation and the provision of retail service would be incomplete, the open-access policy

would likely be doomed to fail, and the competitive benefits of the policy would not then be realized.

Analysis

Background: Market Design Questions Posed by 700 MHz Auction

The 700 MHz band auction provides the FCC with a unique opportunity to foster competition. It is important to observe that, in setting the auction rules, the FCC *by definition* is involved in an exercise in market design. The choice of any particular band plan and the associated service rules attached to the licenses will affect the structure of competition and will influence the type and scope of products being delivered to consumers. The task faced by the Commission in crafting and adopting auction rules is thus not a simplistic choice between polar states of “regulation” and “deregulation.” Neither should the task be understood simply as a contest between competition policy and market forces. Whatever the FCC decides with regard to auction policy, that policy choice will influence the structure of the market just as surely as ordinary market forces will. Consequently, eligibility restrictions in auction rules should be considered by the Commission on a case-by-case basis, given the goals set by Congress and the particular features of the market at issue.

For example, in what has been lauded by William Safire as the “the greatest auction in history,” the A and B block auction of Personal Communications Services (“PCS”) licenses, the FCC imposed eligibility restrictions through the policy of spectrum caps.⁵ Wireless incumbents were prevented from purchasing 30 MHz licenses in geographic areas in which their combined holdings would exceed the spectrum cap of 45 MHz. However, some of these incumbents were able to purchase 10 MHz licenses in the D and E blocks in a subsequent auction without exceeding the cap. Despite the protests of the incumbents at the time, the A and B block auction turned out to be a noted success, and it is widely regarded as having facilitated new national and regional market entrants and true competition in wireless markets.

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Vertical Integration from Bottleneck Spectrum Assets Harms Downstream Competition

The incentives of vertically integrated providers to engage in anticompetitive conduct have been analyzed in a number of models in the academic economics literature. For example, Mandy (2000) surveys several models motivated by traditional antitrust concerns in the telecommunications industry.⁶ He examines whether and to what extent a vertically integrated firm with a monopoly in an input possesses incentives to disadvantage its rivals in downstream markets when the price of the monopoly input is regulated, and he finds that “data for the US telecommunications industry strongly support the conclusion that Bell Operating Companies (BOCs) currently have incentives to discriminate against their long distance rivals.”⁷ More recently, Rey and Tirole (2006) have focused on the incentives of an input monopolist to engage in vertical foreclosure when it is not subject to price controls in the upstream market.⁸ For one class of models, the authors find that a firm controlling a bottleneck input has the incentive to integrate vertically into the downstream market and discriminate against its downstream rivals, harming competition. However, the motivation for the dominant firm’s anticompetitive conduct is not the extension or leveraging of market power to downstream markets; rather, it is the preservation of existing market power in the upstream market.⁹

These findings are consistent with Coase’s theorem on durable goods monopoly, as is explained by Rey and Tirole:

As is well-known, a durable-good monopolist in general does not make the full monopoly profit because it “creates its own competition”: By selling more of the durable good at some date, it depreciates the value of units sold at earlier dates; the prospect of further sales in turn makes early buyers wary of expropriation and makes them reluctant to purchase.¹⁰

Consider, for example, a situation in which an upstream monopolist attempts to recapture monopoly profits by selling *only* the amount of the input required to produce the monopoly output. Input sales are split equally to each of two downstream firms. The downstream firms sell the monopoly output level at monopoly prices. The upstream monopolist seeks to recapture the downstream monopoly profits of the two firms by raising the input price above its competitive level. In practice, an offer by the upstream monopolist to sell half the monopoly input level to each downstream firm is not credible. If either downstream firm accepts this offer, the other downstream firm has an incentive to transact a higher volume of sales with the upstream firm, resulting in total downstream output above the monopoly level.¹¹ The inability of the non-integrated upstream firm to commit to selling the monopoly level of the input implies that it cannot earn the monopoly profit. From the perspective of the upstream monopolist, vertical integration can provide a solution to this problem. Rey and Tirole (2006) find support for their analysis in experimental studies and in empirical work.¹²

When a larger volume of an upstream product is sold at wholesale to downstream competitors, the purchasing firms will likely displace the integrated firm in the downstream market and reduce its downstream profits. Therefore, in making a decision to sell an upstream product at wholesale to downstream competitors (such as, in this instance, the wholesale provision of transport capacity to retail providers of mobile telecommunications services), a vertically integrated provider will consider not only the incremental profit to be gained from its upstream (or wholesale) operation but also the incremental loss of downstream (or retail) profits that will result. An important consequence of this is that when the increased profits from expanded upstream sales are lower than the lost profits in the downstream market, the integrated firm will have an incentive to discriminate in, or limit, the provision of its input to downstream rivals. A no-retail rule, under which the operation of the transport network is economically severed from the provision of retail service, addresses this concern and is therefore pro-competitive.

The current market structure of the CMRS industry is an oligopoly where the major firms are all vertically integrated. The license holders are also the retail service providers.¹³ To date these firms have largely adopted a closed model where they demand 40-50 percent of the content and application developers’ revenues for access to the cell phone user.¹⁴ This example supports the view that incumbent firms have an inherent conflict in developing a truly open network in which wholesale activities would cannibalize their current retail revenue streams.

Recognizing the ability and incentive of large network operators such as Verizon and AT&T to discriminate profitably in the provision of the input necessary for downstream service (and to hinder the development of efficient and innovative competition at the retail level), potential entrants may fear that the large operators will be prepared to outbid new entrants in the auction. The new entrants will then rationally choose not to participate. With open access, entrepreneurial firms will recognize a greater opportunity to acquire licenses and will thus participate in the auction to a greater degree than otherwise. Peter Cramton, Andrzej Skrzypacz, and Robert Wilson concluded that “[a]n open access, wholesale E Block, combined with bidding credits, will increase auction revenues.”¹⁵ I agree that a well-structured auction with open-access restrictions on the E-block license can actually increase auction revenues, especially when the additional revenues from the smaller supply of unencumbered blocks are taken into account. For example, Google’s recent letter to the Commission states that it will be prepared to bid \$4.6 billion if the FCC imposes true open-access provisions – this indicates that even Google fears that without true open-access provisions, incumbents will dominate the auction and it would not be worth investing to bid in the auction.

Open Access in Finland

The idea of using an open-access wholesaler as a means to check market power is neither new nor untested. For

example, FCC economist Jerry Duval has championed an open-access approach characterized by the use of an alternative distribution company, or “ADCO.”¹⁶ The government of Finland recently adopted this pro-competitive approach to achieve a national broadband policy with the aim of making 2 Mbps broadband service competitively and ubiquitously available to the Finnish residential population and business communities.¹⁷ In 2005, in furtherance of this policy, the Finnish government allocated spectrum in the 450 MHz band to create a national open-access wholesaler. The license was subsequently awarded to Digita Oy. The Finnish regulatory authority explained its choice of Digita as follows: “Digita does not act as a service provider in today’s communication market, nor would it do so in this network. It follows that Digita’s network would be more open than the networks operated by other applicants.”¹⁸ In other words, the Finnish government viewed the disassociation of the wholesale and retail functions as an important and perhaps decisive criterion in its award of the license to Digita.

Digita was required to build out a national 4G Flash-OFDM network that it would make available to service providers on open-access terms.¹⁹ Digita’s open-access network became operational in April, 2007. Coverage includes a region in the Helsinki-Turku-Tampere triangle in South Finland and a more northerly region from Oulu to Vuotso. To date, there are ten companies providing service on the network and broadband access has been extended to regions where previously there was little or no service.²⁰ Digita recently announced that Sonera, the largest incumbent mobile operator in Finland, was to start providing service on a trial basis over Digita’s wholesale network in June 2007.²¹ While it is too early to conclude that the Finnish experiment with open-access networks is a success (subscription data will only be available in the fall), the indications thus far have been encouraging.

The imposition of wholesale or open-access requirements on a licensee before an auction (as was the case in Finland) represents an *ex ante* service requirement. As such, it is markedly different from the imposition of open-access requirements after an operator has already sunk millions or billions of dollars into a network. In the former case, the winning bidder factors in the economic effects of the restrictions when formulating its business plans *ex ante*. The licensee’s obligation cannot be characterized as an unexpected change in regulations, and the licensee need not alter its business model or its corporate structure *ex post* in order to meet the open-access requirement. Regulators elsewhere have recognized the difference between *ex ante* and *ex post* requirements in the provision of wholesale services. For example, the relevant Finnish regulatory authority, in the case of the 450 MHz band allocation, determined that the only way of ensuring an open-access network given the European regulatory framework was to “take account of this factor *upon granting the operating license.*”²²

Wholesale Rules Must Align With Underlying Economic Incentives

The relevant question in the case at hand can be expressed as such: Would the benefits of an open-access policy be obtained if the wholesale operator was owned by, or affiliated with, a vertically integrated firm possessing market power in products that use the spectrum as an input? The analyses in the economics literature, summarized above, tell us that there is a conflict of interest whenever the incumbent earns rents in the downstream market. Moreover, the well-known difficulties faced by the FCC in implementing the Telecommunications Act of 1996 demonstrate the extent and severity of this conflict when a firm is required to wholesale an input in a manner that is not “incentive compatible.”

Even opponents of the open-access approach concede that vertically integrated networks have incentives to engage in anticompetitive conduct. For example, Robert Crandall and Hal Singer have recently observed that, “[b]efore its breakup, AT&T had both the incentive (due to its vertical integration) and the ability (due to its market power in voice service) to engage in anticompetitive conduct in complementary markets (equipment).”²³ Today, a number of important complementary telecommunications markets are characterized by the sort of vertical structure and market power that Dr. Crandall and Dr. Singer relate to anticompetitive conduct in the past.²⁴ These markets include, for instance, wholesale roaming, special access, and residential broadband access. Consumers in all these markets stand to benefit from the entry of an open-access wholesale provider that does not have the anticompetitive incentives of vertically integrated incumbents.

Mandating open access on one or more 10 MHz license(s) in the upcoming 700 MHz auction would not preclude incumbents from pursuing integrated business strategies. First, the limitation would be targeted to a single band among all of the bands to be sold in the 700 MHz auction. Therefore, firms that do not want to follow the open-access wholesale model can easily acquire other licenses that will allow them to pursue other business models. Of course, the major incumbent carriers are already operating closed and vertically-integrated retail networks. Second, an auction rule does not prevent incumbents from later obtaining a license on which they were initially prevented from bidding through an acquisition of, or merger with, the winning bidder. Such transactions are ordinarily subject to a public interest review by the FCC and possible review by the antitrust agencies. Permitting incumbents to buy an open-access license in the auction would allow them to avoid such scrutiny, however, since it would effectively allow them to implement a *de facto* acquisition at the time of the auction that otherwise may have been prohibited as anticompetitive.

The FCC demonstrated considerable prudence in its initial PCS band plan and in its particular implementation of eligibility rules. Had incumbents been allowed to foreclose entry in PCS, it is unlikely that consumers would have

enjoyed the dramatic price reductions in commercial mobile radio services (“CMRS”) that occurred with the introduction of new competition. Nevertheless, despite those initial competitive price reductions, the wireless industry has recently become substantially more concentrated.²⁵ Recent evidence shows that the pace of price reductions has decelerated. In some cases, as with text messaging, prices have actually increased. The 700 MHz auction is an opportunity for the Commission to restore the more vigorous competition that characterized the wireless industry between 1996 and the recent wireless mergers.

Conclusion: Open Access Requires Entry by a National Wholesaler

An open-access requirement for the E block license has several key components that would enhance consumer welfare. In particular, the adoption of open-access rules and the creation of one or more new independent wholesale competitor would likely foster innovation and competition in accordance with Congressional direction to the Commission. However, the history of the industry counsels that, in order for this innovation plan to be successful, the license should be awarded to an entity that is independent of incumbent firms with market power.

These considerations, together with the other issues discussed above, suggest that the Commission should impose eligibility restrictions on the E block license that prohibit vertically integrated incumbents from bidding on the license. Should it choose not to implement such restrictions, the Commission should in the alternative grant bidding credits to entities willing to provide an open-access, wholesale network. In order to promote competitive entry, the credits should be sufficient to offset the incumbents’ rational economic incentives to foreclose entry in an attempt to preserve legacy rents.

The history of strategic bidding in spectrum auctions illustrates that an incumbent can deter an efficient entrant by exploiting the “exposure problem.” For example, an entrant that must win an aggregation of regional licenses in order to assemble a national footprint can be deterred by an incumbent that aggressively and selectively drives up the prices of all licenses in the collection by bidding on just one of the licenses at any one time.²⁶ In such a situation, the incumbent risks being stranded with one overpriced license, while the entrant risks paying too much for the remaining licenses, which may be worth far less to it if it fails to achieve the national footprint. To forestall this form of gaming, the Commission should make a national license available. Alternatively, the Commission should implement a limited combinatorial auction. A simple solution would be to define individual licenses for a band for each Economic Area, combined with a national license for the band. The national license would be awarded if the gross price for this national license exceeds the sum of the prices bid for the EA licenses in that band. If the Commission chooses to offer a national license, then I strongly agree with Bulow *et al*²⁷ that the package bidding option should be limited to *de novo* entrants. Such a format would encourage the widest

possible participation in the auction. Moreover, the implementation of such a design is a trivial one-license addition to the existing FCC SMR auction mechanism.

In conclusion, I reiterate that the open-access policy would likely be doomed to fail and the competitive benefits of the policy would not then be realized if the open-access license were controlled by an entity that was affiliated with a vertically integrated retail provider. No blocking and no locking are likely to be toothless without the third leg of the stool: no retail. If the FCC is serious about open access, it should set aside a modest amount of spectrum in the 700 MHz Auction for a wholesale-only provider.

Endnotes

¹ See, e.g., Comments of the *Ad Hoc* Public Interest Spectrum Coalition, WT Dkt No. 06-150 (FCC May 23, 2007), p. iii; Comments of Google Inc., WT Dkt No. 06-150 (FCC May 23, 2007), p. 8; Letter from Amol Sarva *et al.*, Wireless Founders Coalition for Innovation to the Honorable Kevin Martin, Chairman, FCC, WT Dkt No. 06-150, undated; and Frontline Wireless, Initial Comments, WT Dkt No. 06-150 (FCC May 23, 2007), p. 3. The *Ad Hoc* Public Interest Spectrum Coalition (PISC) consists of Champaign-Urbana Community Wireless Network, Consumer Federation of America, Consumers Union, Educause, Free Press, Media Access Project, New America Foundation, Public Knowledge, National Hispanic Media Coalition, and U.S. Public Interest Research Group.

² For greater detail on locking and blocking, and for other examples, see Timothy Wu, “Wireless Net Neutrality: Cellular Carterfone and Consumer Choice in Mobile Broadband,” New America Foundation, Wireless Future Program Working Paper #17 (Feb. 2007).

³ See Frontline Wireless, Initial Comments, WT Dkt No. 06-150 (FCC May 23, 2007); see also “An Engineering Assessment of Select Technical Issues Raised in the 700 MHz Proceeding,” Columbia Telecommunications Corp., May 2007, appended to Comments of the *Ad Hoc* Public Interest Spectrum Coalition, WT Dkt No. 06-150 (FCC May 23, 2007).

⁴ See Frontline Wireless, Initial Comments, WT Dkt No. 06-150 (FCC May 23, 2007), p. 17.

⁵ William Safire, “The Greatest Auction Ever,” *New York Times* (March 16, 1995) at A25.

⁶ David Mandy (2000), “Killing the Goose that May Have Laid the Golden Egg: Only the Data Know Whether Sabotage Pays,” *Journal of Regulatory Economics*: 17:2, pp. 157-172.

⁷ David Mandy (2000), “Killing the Goose that May Have Laid the Golden Egg: Only the Data Know Whether

Sabotage Pays,” *Journal of Regulatory Economics*: 17:2, pp. 157-172, p. 158.

⁸ Patrick Rey and Jean Tirole (July 16, 2003), “A Primer on Foreclosure,” *forthcoming in* Mark Armstrong and Rob Porter, eds. (2006), *HANDBOOK OF INDUSTRIAL ORGANIZATION III* (hereinafter, “Rey and Tirole (2006)”). For an application to the FCC, see also Michael Riordan (2005) “Competitive Effects of Vertical Integration,” Columbia University Department of Economics DP # 0506-11.

⁹ See Rey and Tirole (2006), pp. 36-37.

¹⁰ See Rey and Tirole (2006), p. 13.

¹¹ See Rey and Tirole (2006) pp. 17-18.

¹² Rey and Tirole (2006), pp. 24-25, 27.

¹³ A partial exception is Mobile Virtual Network Operators (MVNOs), but these are largely just resellers of the license holder’s service. However, most MVNOs are structured to compete in market niches so as not to threaten the mass market retail business of the incumbent supplier of wholesale network services. In the case of Virgin Mobile, perhaps the most prominent MVNO, the wholesale supplier, Sprint, insisted upon a significant equity participation and involvement in corporate governance. Needless to say, a wholesale-only network provider would have incentives to sell to any and all retail providers without such restrictions. See Written Statement of Amol R. Sarva on behalf of The Wireless Founders Coalition for Innovation, before the Committee on Commerce, Science and Transportation, United States Senate, June 14, 2007, pp. 9-10.

¹⁴ See, e.g., http://www.jumpatp.com/ns_item.aspx?newsID=28.

¹⁵ Peter Cramton, Andrzej Skrzypacz, and Robert Wilson, “Summary: Revenues in the 700 MHz Spectrum Auction,” 27 June 2007, page 1.

¹⁶ See Jerry B. Duvall, “Entry by Electric Utilities Into Regulated Telecommunications Markets: Implications for Public Policy,” presented before the Communications Industry Committee, ABA Section of Antitrust Law, Collier, Shannon, Rill & Scott, PLLC, Washington, D.C. (February 6, 1998). See also Jerry B. Duvall & George S. Ford (Apr. 2001), “Changing Industry Structure: The Economics of Entry and Price Competition,” PHOENIX CENTER POLICY PAPER NO. 10.

¹⁷ See Ministry of Transport and Communications Finland, “Communications: Broadband Networks,” <http://www.mintc.fi/scripts/cgiip.exe/WService=lvm/cm/pu/b/showdoc.p?docid=2424&menuid=422> (Feb. 21, 2007).

¹⁸ Government Decision on an Operating License for a Digital Mobile Communications Network in the 450 MHz

Frequency Band, 22 June 2005, Unofficial Translation, page 22.

¹⁹ See Digita, “Digita: @450,” http://www.digita.fi/digita_dokumentti.asp?path=1841;2081;8103. “OFDM” refers to orthogonal frequency-division multiplexing, a digital modulation mechanism.

²⁰ Personal communication with Martin Andersson of FICORA.

²¹ See Digita, “Sonera Starts as a Service Provider in Digita’s @450 Network,” http://www.digita.fi/digita_dokumentti.asp?path=1841;3801;2089;9363 (May 29, 2007).

²² Government Decision on an Operating License for a Digital Mobile Communications Network in the 450 MHz Frequency Band, 22 June 2005, Unofficial Translation, page 22 (emphasis added).

²³ Robert W. Crandall and Hal J. Singer, “Telecom Time Warp,” *Wall Street Journal* (July 11, 2007), at A15.

²⁴ Standard references on “vertical sabotage” include Patrick Rey and Jean Tirole (July 16, 2003), “A Primer on Foreclosure,” *forthcoming in* Mark Armstrong and Rob Porter, eds. (2006), *HANDBOOK OF INDUSTRIAL ORGANIZATION III* and David Mandy (2000), “Killing the Goose that May Have Laid the Golden Egg: Only the Data Know Whether Sabotage Pays,” *Journal of Regulatory Economics*: 17:2, pp. 157-172.

²⁵ See Frontline Wireless, Initial Comments, WT Dkt No. 06-150 (FCC May 23, 2007), pp. 9-13.

²⁶ A pattern of blocking bids successfully thwarted a new national wireless competitor in last year’s Advanced Wireless Spectrum (AWS) auctions. See Gregory Rose, “Spectrum Auction Breakdown: How Incumbents Manipulate FCC Auction Rules to Block Broadband Competition,” New America Foundation, Wireless Future Program Working Paper #18 (June 2007).

²⁷ Comments of Jeremy Bulow, Jonathan Levin, Paul Milgrom, Stanford University and David Salant, Columbia University and Clemson University, July 9, 2007.