But these are relatively minor distortions. Some of the Haring & Jackson attack is so gratuitous as to be daring. For instance, in thwacking my allegedly "not candid" citation of the NTIA's cellular license value figures of $80 billion nationally, which I labeled "the present value of duopoly profits" (and to which they added emphasis[48]), they attempt to contradict my characterization by noting that "the NTIA *itself* states that its goal was more inclusive."[49] They quote the NTIA as saying it was attempting "...to estimate the current value of a particular portion of spectrum used for a designated purpose."[50] Nothing in *those* NTIA words reveals what they thought about the effect of market structure on profits or license values. (The current value of licenses could well include a hefty increment for duopolistic output restriction, or not.) So the criticism that I am "not candid" is somewhat baffling... until we see what Haring & Jackson fail to report from the NTIA study:

> *These estimates of spectrum value in urban areas [MSAs] reflect the existing duopoly market structure. If additional competitors were to enter the market, the profits of cellular providers would presumably fall (i.e., the monopoly rents would drop), so that the value of spectrum devoted to cellular uses would be lower.*[51]

It is apparent who is being "uncandid" with whom.

4.3 The Haring & Jackson Attack on Private Market Value Numbers.

In presenting NTIA data on the value of cellular telephone systems, I used the estimates which showed the private market sales price data for cellular systems: about $80 billion nationally (MSAs only). The NTIA also reported a lower estimate of cellular telephone

---

48 Haring & Jackson, p. 8.

49 *Ibid.* (emphasis in original).

50 Ibid., quoting NTIA 1991, p. D-1.

51 NTIA 1991, p. D-6. Note too that the NTIA refers to "monopoly rents" as attendant to duopoly market structure. This is the standard lexicon.

license values based upon public market values: $46 billion. For using the larger number, Haring & Jackson write excitedly that "the lower one... has simply *disappeared* from Hazlett's presentation of the evidence."[52]

It is not wrong to use private market values rather than public market values,[53] and it is clear that at least one of the authors of the Haring & Jackson paper agrees with me: In the 1987 paper they prepared for the U.S. Telephone Association, Chip Shooshan and Charles Jackson estimated the market value of a cable system by looking solely at the price of cable systems actually sold -- *i.e.*, its private market value. This study did not even consider public market valuation as an alternative, despite the fact that the values of public companies holding cable systems are often discounted by 30-40%. Indeed, at just the time Shooshan & Jackson were using private market values to estimate cable Q ratios, the public market was valuing cable systems at just 53% of private market values, according to Paul Kagan's *Cable TV Investor*, prompting the industry newsletter to remark that "The 53%-of-PMV [private market value] figure is the lowest in years..."[54]

The reason that actual trading prices of cellular systems are more appropriate benchmarks of market value is that such prices do not entail some of the complications involved in sorting out the value of other assets owned by public corporations, the publicly-held systems may sell at a discount due to the transactions costs associated with assembling and managing

---

52 Haring & Jackson, p. 8, (emphasis in original).

53 The term "private market" refers to actually sales of cellular (or cable television) systems, even if the transactors are public companies. The "public market" refers to the valuation of the companies which own cellular (or cable) systems.

54 *Cable TV Investor* (12 February, 1988; p. 3). The differential in public vs. private market values in cable is still significant. In mid-1993, Paul Kagan & Associates reported that public companies in the cable business were selling for just 64% of 10X cash flow, while private market transaction values were averaging 10X cash flow (or 100%). Paul Kagan & Associates, *Cable TV Financial Databook* (June 1993), pp. 50, 130.

the various assets in the company's portfolio, and there may be tax (or other) liabilities which the firm has accrued and which are difficult to separate from asset values. (This is similar to the paradox that closed-end mutual funds have been known to trade for significant discounts from the prices of the underlying stocks which they own, despite the fact that the funds consist *only* of the underlying stocks.[55]) Indeed, the Congressional Budget Office made use of the NTIA's private market figures with no mention of public market discounts:

> *NTIA has estimated that cellular licenses in the more than 300 MSAs would be worth $80 billion. The estimate was predicated on a sample of 24 transactions made in 1990... It is based on a small sample, although many other transactions support the levels used. It incorporates the value of the existing duopoly regulatory structure, and thus would have to be adjusted downward if conditions closer to a competitive market were to be created by new entrants.*[56]

The prices paid in actual sales seems to me, as it did to Charles Jackson when he was writing about cable's market power, a reasonable estimate of value. Yet, if the lower figure is used, this certainly does not eliminate the supra-competitive returns associated with a cellular telephone license. $46 billion is still higher than zero, and realistic Q ratios constructed with such values are still comfortably above unity, as seen below.

4.4 The Haring & Jackson Attack on Jackson's Numbers.

In Charles Jackson's 1991 report on the costs of delaying cellular service the very same issue -- valuation of cellular telephone companies -- was addressed. Jackson's own study wrote:

---

55 "Discounts of 20% are common, and even higher discounts are sometimes observed." Andre Schleifer and Richard Thaler, "Investor Sentiment and the Closed-End Fund Puzzle," paper presented to the Finance Workshop, University of Chicago (September 1989), p. 1.

56 CBO 1992, p. 36. The CBO also refers to the $80 billion MSA license estimate as an "upper bound," by which it refers to the magnitude of revenues which could be realized from auctioning more competitive licenses in the future.

> *Our estimate of the surplus associated with cellular properties equals the total market value of cellular properties less capital investment... The total market value component was extracted from NTIA's methodology based on recent sales transactions. NTIA calculated the 1990 total market value of cellular properties in urban areas to be approximately $87 billion.*[57]

No mention is made of public market discounts. Or, to paraphrase Haring & Jackson: "the lower one... has simply *disappeared* from Haring & Jackson's presentation of the evidence."

Haring & Jackson also criticize my use of 10-year depreciation rates for cellular's capital equipment:

> *[T]he idea that any investment in electronics should have an economic lifetime of 10 years is mind-boggling given the rapid pace of technical innovation in that industry. Our own view is that a lifetime of 5 years more properly reflects the likely decline in economic value of cellular plant.*[58]

They go on to recalculate capital costs based upon shorter depreciable lives.

Yet, cellular investments are not only electronic, but composed of a mix of physical inputs. It is reasonable to conclude that ten years is the appropriate lifetime. At least, it *was* according to Charles Jackson, who previously "boggled his mind" sufficiently to write the following:

> *We can conservatively assume that the life of [cellular] base-station investments is 10 years. Switching and other electronic equipment may have somewhat shorter lives, but land and structures have much longer lives.*[59]

---

57 NERA 1991, p. 11. Since NTIA estimated capital replacement cost at about $7 billion, this produced a net license value estimate of $80 billion.

58 Haring & Jackson, p. 7.

59 1991 NERA Report, p. 17.

Finally, the 1991 NERA Report offers us Charles Jackson's view of the proper calculation of producers' surplus associated with cellular telephone licenses. Surplus constitutes payments in excess of costs, including a normal return on capital invested. According to Jackson:

> *Our estimate, in 1990 dollars, of the producer surplus associated with cellular properties in urban areas is therefore $80 billion.*[60]

This combines the NTIA's $87 billion esimate of MSA cellular license value with a $7 billion estimate of total capital invested. Importantly, it makes no allowance for the "opportunity cost of spectrum," and clearly considers the NTIA value and capital numbers to be appropriate. In following precisely this logic in my analysis, I was condemned by Haring & Jackson in the most colorful terms.

4.5 The Haring & Jackson Numbers Still Produce Monopolistic Q Ratios.

As a thought experiment, let's recalculate the cellular Q-ratio using the NTIA public market values which the Haring & Jackson paper frets have *disappeared.* Poof: They're back. And let us assume that the capital costs (including marketing expense) of cellular systems in late 1990 (coinciding with the NTIA public market values) are even higher than what Haring & Jackson report for 1992: $1,808 per subscriber. (Haring & Jackson claim June 1992 capital costs per subscriber of $1,670 -- "more than *twice* the number used by Hazlett in

---

60 NERA Report, p. 12.

his analysis."[61]) In December 1990 there were 5.2 million cellular subscribers.[62] The upshot is that capital costs in the cellular market amounted to $9.4 billion -- 40% above what the Commerce Department identified as "Estimated Total Replacement Cost" of cellular systems in 1991.[63] Let us also forget about the 1991 figures used by Charles Jackson which imply a Q = ($87 billion)/($7 billion) = 12.43.[64] We shall use figures in excess of the Haring & Jackson capital cost-per subscriber number, and employ the public value numbers they (now) champion to determine the net market value of cellular *licenses*: $46.4 billion.

This implies a Q = 5.9.[65] And it has been adduced using the Haring & Jackson numbers, by my count (and Mr. Jackson's count in his previous studies of both cable and cellular markets) too light on the value side and, by the CBO, NTIA, and Mr. Jackson's previous count, too heavy on the cost of capital side.

---

61 Haring & Jackson, p. 6. It seems like *deja vu* combined with a little role reversal for Charles Jackson, perhaps; the Q ratio he estimated for the cable industry was attacked by TCI as way too high. Their reply took issue with every cost estimate, value estimate, methods employed, etc., etc. Shooshan & Jackson replied: "As a general proposition, it is true that estimates of q reflect subjective judgments and can vary, depending on those judgments. However, the monopoly/monopsony profits of the cable industry are so large that they can be detected by any reasonable procedure for calculating the q ratio." Shooshan & Jackson 1988, p. 6.

62 Dennis Leibowitz, Joel Gross, Eric Buck, and Frederick Moran, *The Cellular Communications Industry* (New York: Donaldson, Lufkin & Jenrette, Winter 1992-93) [Hereinafter [DLJ 1992"], p. 11.

63 Which was $6.7 billion (NTIA 1991, p. D-5).

64 This is just below the medium-sized market Q-ratio of 12.41, which I reported in Table 4 (Hazlett 1993, p. 14).

65 The market value of cellular systems = ($9.4 billion + $46.4 billion), while the replacement cost of capital = $9.4 billion. Hence, ($55.8 b.)/($9.4 b.) = 5.9. Note that the replacement cost of capital must be added to the value of licenses in the numerator so as to obtain the entire market value of cellular systems; indeed, the NTIA estimated the value of licenses by subtracting the cost of capital *from* full market value.

This Q = 5.9 is clear evidence of supra-competitive profits. Michael Salinger writes: "Provided that all inputs are provided competitively, *q* should be highly sensitive to even small amounts of monopoly power."[66] More to the point, perhaps, are Mr. Jackson's own analyses of this subject. When analyzing Q ratios in cable television markets, he (with Chip Shooshan) settled on a Q value of 2.81 for the industry. When TCI objected, the response was as follows:

> *Although TCI attacked our numbers and suggested numbers of their own, TCI failed to complete the analysis by calculating the appropriate q ratios. Let us now calculate the q ratio based on the numbers and procedures proposed by TCI...*[67]

The resulting Q ratio was estimated to be 1.59. This led Shooshan & Jackson to surmise:

> *This q ratio can be compared to the q ratio of 0.805 for all non-financial corporations. Thus, the q ratio for the cable industry, even using TCI's proposed numbers and procedures, is almost twice that of the rest of the non-financial economy. Given our rejection of alternative explanations for the high q ratio, we conclude that the cable industry is earning excessive monopoly/monopsony profits. Indeed, even with TCI's numbers, expected monopoly/monopsony profits are about 60 percent of the book value of the industry's tangible assets.*[68]

In electing to present their evidence putting capitalized profits at nearly *six times* capital costs, Haring & Jackson define a Q ratio of 5.9 for the cellular telephone industry. According to standard economic analysis, and Mr. Jackson's previous work, this is

---

66 Michael A. Salinger, "Tobin's *q*, Unionization, and the Concentration-Profits Relationship," *Rand Journal of Economics 15* (Summer 1984), p. 159.

67 Shooshan & Jackson 1988, p. 15.

68 *Ibid.*

overwhelming evidence of the existence supra-competitive returns. Surely, whatever can be said about "excessive monopoly/monopsony profits" of a Q ratio of 1.59 goes several times over for a Q = 5.9.

5 Duopolistic Output Restriction in Cellular Telephone Markets.

The Haring & Jackson paper attempts to dismiss any claim regarding market power in cellular markets by claiming that there is no reason to believe that the cellular incumbents restrict output (or raise price) to do anything other than ration a scarce resource: spectrum. Of course, the high prices paid for cellular license rights constitute graphic, revealing evidence that there are supra-competitive returns being made in this market. Since licensees do not bid spectrum out of competing uses, these license payments are not "resource costs" but rents -- payments in excess of costs.

However, there is an empirical case that could be made (Haring & Jackson do not) that the reason investors pay so much to purchase one of two cellular duopoly licenses is that, given the parsimonious spectrum allocations which each constitutes, high prices must be charged (far above unit costs) simply to ration the artificially constrained frequency space. This implies a marginal cost curve which rises rapitdly as the number of phone calls placed over any one system reaches its maximum traffic capacity. Hence, profits are large because -- while price equals marginal cost for the last call made -- average cost is far below both price and marginal cost. In other words:

1. capacity is constrained in cellular markets such that prices must be raised above average costs simply to keep access lines open;

2. since the FCC has not imposed a fee for the spectrum itself, the margin between such prices and average costs will accrue to the licenseholder as profit (or license rents);

3. and, in setting price just equal to the marginal cost of serving the last customer, the duopoly cellular telephone provider does not restrict output any more than what is necessary, given the FCC's allocation of megahertz.[69]

Haring & Jackson adduce no evidence for this view that there is no output restriction attendant to the FCC's two-to-a-market license policy in cellular; they simply state that they can explain high license values by constructing a theory. They hope that by shifting the burden of proof to others,[70] this theoretical construction will explain away market power in the industry. To cite their words, with appropriate substitution: "*They* can tell a story, but there are lots of stories that can be told."[71]

Unfortunately, there are obvious facts observed in the cellular marketplace which contradict the no-market power view, and the FCC's own analyses have consistently concluded -- based on this evidence -- just the opposite of Haring & Jackson: Duopoly suppliers do restrict output in cellular markets. Indeed, the cellular providers have concluded this themselves, a fact discussed in my previous paper, and one which the Haring & Jackson paper scrupulously avoids.

---

69 As shown above, this is not the same as saying that cellular licenses prices simply reflect the opportunity cost of spectrum. License values reflect that the price of cellular service has been driven up by FCC allocation policy which has confined its licenses to use just a small fraction of airwave space that consumer demand would, given the social opportunity cost of spectrum, deem efficient.

70 Haring & Jackson, p. 5.

71 Haring & Jackson 1993 write: "Since theory is Hazlett's *only* basis for arguing that observed rents are the product of duopolistic output restriction, his case thus fails. He can tell a story, but there are lots of stories that can be told, consistent with observation, and that is really the point. The fact that the story he tells is actually *inconsistent* with a competitive market failure underscores the errors in his analysis" (p. 4, emphasis in original). This jubilant summation of their section on Cournot duopoly theory, which they completely fail to understand, alerts the reader to the degree of distortion involved here. My case for duopoly market power was and is based on the market evidence, a point I make explicitly in the previous paper and in this one.

5.1 Under-Utilization of Capacity.

If cellular telephone service rates are high *only* due to the scarcity of cellular spectrum allocated by the FCC, and such prices are necessary to ration scarce airwave access, an observable implication in the cellular telephone service market is that systems are operating at or near full capacity. Yet, cellular rates been *falling* in recent years as cellular usage has been *dramatically increasing*, an observation plainly at odds with this view.

According to the General Accounting Office, inflation-adjusted cellular telephone rates for airtime declined about an average 27 percent during the 1985 to 1991 period.[72] Another study found that the effective rate charged to customers using 100 minutes per month of cellular calling time fell 29 percent over the 1985-1992 period.[73] In that cellular subscribership rose nationally from about 203,000 in June 1985 to 6.4 million in June 1991 and 8.9 million in June 1992, it is curious that spectrum scarcity was not so constraining a factor as to force prices to rise. This is even more curious in that the national average density of systems, measured by subscribers per cell site, rose from 372 in December 1985 to 962 in June 1992.

Moreover, if cellular systems are rationing access against capacity constraints, then why do rates in sparsely populated MSAs or RSAs often exceed rates charged in areas where population density is far higher, and utilization of the airwaves considerably more intense? For instance, the rate charged for 150 minutes of monthly usage is only $67.80 on the A sys-

---

72 United States General Accounting Office, "Concerns About Competition in the Cellular Telephone Service Industry," (GAO/RCED-92-220; 1 July, 1992), p. 22. Falling cellular rates are not evidence -- by themselves -- of either competitive or monopolistic market structure. Because the company lowering price also set the previous price, all that appears is that the firm's profit maximization calculus has changed. This could be due to greater market competitiveness, or to lower marginal costs, or to shifts in consumer demand, *etc.* Since a firm with market power could very well face market demand shifts which encourage it to set a lower *monopoly* price than previous, the implications of price changes alone are ambiguous.

73 *Ibid.*

tem and $62.82 on the B system) in Chicago, but is $80.40 on both A and B systems in New Orleans, despite the fact that there are 525,928 cellular subscribers in Chicago and but 62,100 in New Orleans.[74]

After reviewing both rate and capacity utilization data for California cellular markets, the Division of Ratepayer Advocates noted:

> *Currently, only parts of the LA [Los Angeles] market are capacity constrained and will need significant investments in order to expand their services. LA has an efficiency ratio of 635 subscribers per each frequency which is at least three times larger than the next largest market. LA's efficiency ratio illustrates the expansion that is possible in the other California cities. Clearly, capacity is not a constraint for expansion; cellular prices are.*[75]

It is apparent, after observing the data, that cellular systems are pricing higher than is necessary to ration scarce frequency space.

Supporting evidence can be found in a 1992 Donaldson, Lufkin & Jenrette report cited by Haring & Jackson. The DLJ model of the future growth of the wireless telephone market indicates that current duopoly incumbents are restricting output. The report changes previous DLJ projections of subscriber growth to account for competitive entry in wireless telephone markets, which they had come to see as a given. This prompted them to lower their forecast of subscriber rates, and to project that at least 60% of the additional (new) subscribers would be served by the existing cellular duopolists:

---

74 May 1993 prices, as reported in General Accounting Office, "Charges for Itemized Cellular Telephone Bills," (September 1993). There may well be a correlation between high-demand cities and higher prices, because price searching firms with constant marginal costs will likely raise prices when demand increases.

75 Memorandum to Commissioner Fessler, Joe Delloa, "Cellular Rates," (San Francisco: California Public Utility Commission; 22 December, 1992), pp. 1-2.

> *[W]e are finally collapsing our two alternative valuation models into one, in recognition of the fact that the advent of lower-priced consumer portable services, whether provided by new PCN competitors or the current operators, is a matter of when, not if. Previously, we used a basic model which extrapolated the current business out to the Year 2000, assuming an increase in penetration to 15%, but with rates still at $67 per month in then current dollars in the terminal year. We also had a faster-growth model which looked to 24% penetration at the end of the decade with $52 rates, and which assumed that the new PCN or SMR entrants would have 20% of the market in the end year. The two models began to diverge, by our forecasts, in 1994. (Fleet Call [Nextel] projects that its ESMR systems will achieve 20% of the growth in its markets after launch, which would account for one-third or more of the market for new entrants if our forecast is correct.)*[76]

If existing providers are expected to expand output from current levels when new competitors enter the market and lower prices, how can spectrum scarcity account for 100% of the rents being earned now?

Consistent with this analysis is the current pricing behavior in cellular markets. Duopoly service providers pay (subsidize) cellular telephone retailers to add new customers to their networks. As Jerry Hausman notes:

> *A primary form of price competition among [cellular] carriers to date has been competition to sign up new customers... Competition between cellular service providers has led to equipment discounts to customers of amounts between $100 - $450 when new customers initiate cellular service. New customers have also been offered significant amounts of free air time. Note that the equipment discounts are an important source of price competition. A discount of say $350 is equivalent to a reduction in the monthly cellular access fee of about $10 per month over a 3 year period...*[77]

---

76 DLJ 1992, p. 15.

77 Affidavit of Jerry A. Hausman in *United States of America v. Western Electric Company, Inc., et al.* (United States District Court for the District of Columbia, Civil Action No. 82-0192; 29 July, 1992), pp. 12-3.

If capacity constraints were forcing cellular systems to ration access time by price, and price were still being set where it equaled marginal cost, then lowering the effective price of access for the marginal subscriber would mean that the firm was pricing below marginal cost. Pricing below marginal cost is evidence of non-economic behavior.[78] This sort of price discrimination in favor of new customers reveals that the cellular duopolists themselves believe that prices charged are, in general, above marginal cost; *i.e.*, that firms are using their market power to restrict output from competitive levels.

5.2 The Reed Study.

FCC studies of cellular have shown that spectrum scarcity implicit in 25 MHz licenses does not create cost curves which are consistent with the Haring & Jackson explanation. In a 1992 study conducted by David Reed, an engineer and policy analyst in the Office of Plans and Policy, it was shown that both PCS and cellular providers have average cost curves which sharply decline with output (number of subscribers) and then level off to a relatively flat shape, indicating constant returns to scale. As cellular architecture (or micro-cellular, in the PCS case) is easily adaptable to higher capacities with additional investment in new cells, this makes intuitive sense. As new subscribers are added to a system, frequencies are reused more often, a process accomplished by cell splitting. Reed's study shows average costs for a 25 MHz cellular service provider remaining flat up to 50% market penetration, far higher than today's cellular penetration ratios. Under this scenario, the billions paid for cellular

78 The argument that firms are engaged in predatory conduct is ruled out, because specific capital is sunk, firms are highly profitable, regulatory constraints bar mergers, and there is no exit from the industry.

licenses can only mean that prices are being raised above average cost, and that capacity constraints (which would imply rapidly rising incremental costs as the airspace becomes fully congested) do not provide the explanation.

Reed's analysis for FCC policymakers included an appraisal of how the amount of spectrum awarded to each cellular or PCS licensee would affect the level of costs; both how it would affect minimum efficient cost (the cost achieved when the cost curved flattened out), and how it would impact the volume needed to achieve minimum efficient cost.

Reed found that relatively modest spectrum allocations (10 MHz - 30 MHz) would allow new entrants to achieve minimum efficient scale for carrying the volumes of traffic which were likely to be involved. He also found that there were economies of scale and scope between cellular and PCS; that allowing an existing cellular provider to also have some PCS spectrum space would enable an efficient digitization of existing (analog) cellular service. Pointedly, his policy recommendation was to thereby allow each of the two incumbent cellular firms to acquire (or utilize) up to 10 MHz of spectrum space, but no more. New entrants, meanwhile, were permitted access to blocks of up to 40 MHz. The limitation on spectrum to cellular incumbents was clearly dependent on Reed's assessment of efficiency: existing firms should be able to expand output to offer new services, but that the market power of existing licensees should not be allowed to thwart increased competition. His argument for limiting spectrum assignments of more than 10 MHz to cellular operators was thus:

> *Several reasons exist for precluding cellular operators from acquiring additional spectrum in the 2 GHz band. First, model results indicate 25 MHz of spectrum is sufficient to deliver PCS using microcells and cellular services using macrocells at competitive unit costs. In particular, the marginal benefits of additional spectrum appear to be relatively small for the base case assumptions. Second, cellular operators already have a significant first mover advantage on PCS markets. Allowing them to gain the benefits from additional spectrum would make it more difficult for new entrants to establish*

themselves in the marketplace. Third, allowing cellular operators to obtain 2 GHz spectrum would reduce the number of competitors in the PCS market.[79]

If cellular incumbents do not exercise some significant degree of market, Reed's prescription to limit spectrum for incumbent firms is inexplicable. Why favor entrants over incumbents when distributing the new spectrum rights? Moreover, Reed's study shows that the additional benefits derived from giving existing firms any more than a modest amount of new spectrum are small; if spectrum scarcity (and not duopolistic output restriction) were the constraining force, then new spectrum allocated to incumbents would have a large impact in providing new services to the public -- as large as that realized by distributing the spectrum to new entrants. Reed rejects this view, and advocates a policy which specifically reflects that judgment. As seen below, the Commission's PCS policymaking has, as well.

5.3 The Kwerel-Williams Study.

The question of market power in cellular duopolies was addressed by Evan Kwerel and John Williams in 1992. In their cost/benefit analysis of a voluntary reallocation of the frequency space effectively covered by one UHF-TV licensee in Los Angeles into cellular telephone service, they had to estimate the impact of new entry into cellular markets by a third firm vs. added spectrum space for the two existing firms (using a fixed amount of new cellular spectrum in either case). This led them to implicitly consider the output-restricting capacity of existing cellular providers by explicitly considering the likely output-expanding impact of a policy which favored new entry. Their analysis is revealing:

---

79 David Reed, "Putting It All Together: The Cost Structure of Personal Communications Services," FCC Office of Plans and Policy, Working Paper No. 28 (November 1992), p. 57.

> *Of course, we would expect the price reduction to be much greater if the spectrum were used to create a competing third system rather than dividing it up between the existing operators. Based on a simple theoretical model of oligopoly pricing and some empirical evidence from other industries, we would expect cellular prices to fall approximately 25% as the result of introducing a third competitor.*[80]

The FCC's own studies assume that market power is likely to restrict output and drive price higher than marginal cost. Hence, the marginal cost of spectrum within an FCC license allocation cannot account for the high prices being charged in cellular duopoly markets.

5.4 The Federal Communications Commission PCS Rulemaking.

The recent FCC rulemaking on PCS embodies the logic displayed in the staff studies discussed above. While up to seven new wireless telephone licenses covering 120 MHz of spectrum space are to be assigned in each market, the only economic entities constrained to 10 MHz are the existing cellular telephone incumbents. The logic of duopoly market power can be the only reasonable premise for this exclusion, particularly as the cellular companies can exploit some economies of scope in acquiring access to new spectrum.[81] One may agree or disagree with this regulatory restriction, or find that the safeguards will be insufficient to

---

80 Kwerel & Williams 1992, p. 4. "In our model, entry need only result in about a 3.5% price reduction for the benefits of a reallocation [to a new competitor] to exceed the costs. This price reduction is approximately 2.5 percentage points greater than the minimum required for a reallocation to existing cellular operators to be socially beneficial (case 2) -- a small difference relative to the likely price reductions from introducing a third competitor" (Kwerel & Williams 1992, p. 79).

81 This is detailed in the Reed 1992 study, and noted in the FCC's PCS rulemaking (Federal Communications Commission, "Amendment of the Commission's Rules to Establish New Personal Communications Services," Second Report and Order, Gen. Docket No. 90-314 (Released 22 October, 1993) [hereinafter "PCS Rulemaking"], par. 104.

enforce the 10 MHz limit[82]; the bottom line remains that the only logical interpretation for the incumbent cellular PCS license cap is derivative from the conclusion that market power drives cellular firms to restrict output, and that ensuring that new entrants emerge will yield a greater social value.[83]

> *[W]e are concerned with the potential for unfair competition if cellular operators are allowed to operate PCS systems in areas where they provide cellular service. We believe that constraints should be imposed on cellular ownership of PCS systems within their cellular service areas.*[84]

The FCC's announced policy is to limit cellular company access to new PCS licenses only where they currently operate existing cellular systems, on the grounds that competition would not be well served. The logic is clear: market power is currently being exercised by cellular incumbents in their service areas, and allowing PCS licenses to be absorbed by such firms would likely promote less competition (and less price reduction to consumers) than would new entry. Conversely, where cellular operators do not exercise such market power -- out of their licensed service areas -- there is less of a competitive issue. That the FCC took the step of limiting cellular access to but 10 MHz of PCS spectrum, where other firms were allowed as much as 40 MHz, in light of its own acknowledgement of significant economies

---

82 The FCC's PCS rulemaking specifically recognizes that its rules may be circumvented by warning that the Commission will revisit the issue: "Parties are on notice that we intend to reconsider this limit if we conclude that our intent to insure competition between cellular and PCS could undermined under the ownership rules we adopt today" (PCS Rulemaking, Par. 110).

83 If market power is exercised by cellular duopolists, and new licenses are auctioned by the government (as they will be this May) or in secondary markets, the highest bidders will tend to be the incumbents who derive higher value from the licenses than would entrants who expect to operate in more competitive markets. The fact that FCC allocation policies continue to restrict competition to those holding licenses allows monopolization to occur much more easily here than in free entry markets.

84 PCS Rulemaking, paragraphs 104-5.

of scope between PCS and cellular supply and in light of additional PCS entrants, underscores the importance which the Commission itself placed upon the output-restricting potential of cellular operators.

5.5 The 1992 CBO Study Finds Cellular Duopolists Restrict Output.

The 1992 CBO Report on spectrum license auctions consistently refers to the market power exercised by existing cellular duopolists. They find that new rights to provide wireless telecommunications services will be worth considerably less than existing rights because the greater abundance of competitors will drive down industry rents. Their findings include the following:

> *In each local market, service providers have only limited incentives to engage in price competition. Above-average profits can be defended by keeping prices well above costs.*[85]
>
> *This simple comparison of monthly average revenues with monthly average costs is consistent with the expectation of economists that, in markets with only two producers, prices will remain well above costs. Producers make limited use of pricing as a competitive weapon.*[86]

And in estimating what 50 MHz of new wireless spectrum licenses would fetch at auction, the CBO is careful to explicitly note to the importance of market power. It also employs the $80 billion license-value figure from NTIA which Haring & Jackson object to in my paper, and reasons that license values will drop significantly if the market power of existing cellular duopolists is dissipated via new entry:

> *NTIA's analysis of transactions in broadcasting provides an illustrative counterpoint to the value of $80 billion for the 50 MHz of spectrum allocated for licenses to provide cellular telephone services. Based on 1990 transactions, the value of the over 400 MHz of spectrum allocated to all commercial broadcasting licenses -- AM*

---

85 CBO Report, p. 26.

86 *Ibid.*, p. 27.

radio, FM radio, and VHF and UHF televisions -- was estimated to be $11.5 billion. This estimate suggests an approximate value of $1.3 billion for 50 MHz of frequency. Unlike cellular telephone services, broadcasting is already a mature, highly competitive industry. In this environment, the spectrum allocated for commercial broadcasting is stripped of most of the excess profits that underly the value of the spectrum allocated for cellular telephone services. Although the 50 MHz of spectrum additionally allocated in the base case to land-mobile services will not create a competitive market overnight, the decision by the FCC to make such an allocation would signal the beginning of a policy aimed at creating more competition. Bids for new licenses are more likely to reflect the anticipation of this development than the recent history of high returns guarded by duopoly.[87]

5.6 Cellcos Themselves Attribute License Values to Duopoly Market Power.

Entirely silent is the Haring & Jackson paper on one of the most obvious pieces of evidence of market power in cellular: The cellular telephone operators argue for it themselves. It is worth repeating the following claim made by an expert witness for Los Angeles Cellular Telephone Company, in a 1990 property tax proceeding involving the State of California:

It can be demonstrated that companies in a competitive industry have no particular or material license value. If the market for cellular telephone services was perfectly competitive, it would be open to all sellers willing to make the required investment... Under competitive circumstances, therefore, any license value would be essentially zero.

The market in which the cellular telephone industry operates today is a special form of monopoly or oligopoly called a duopoly. This situation is the result of the FCC limiting to two the number of cellular

87 CBO 1992, p. 37.

> *telephone companies (sellers) in each SMSA... From the licensee's point of view, a license is valuable because it gives the holder some control over its market.*[88]

6 Conclusion.

The critique launched by Haring & Jackson on "Market Power in the Cellular Telephone Duopoly" is entirely without merit. Their theoretical discussion mistakenly sees a Bertrand (perfectly competitive) solution where a Cournot (duopolistic output restriction) solution is described. As to the facts, it is simply undeniable that the firms in the cellular industry make above-competitive profits, and that the primary source of such profits are the barriers to entry erected by past FCC allocation decisions. While the size of such rents can be debated by reasonable people, every available government data source -- and even those taken selectively from industry sources by Haring & Jackson -- indicate the presence of huge rents being earned in cellular. Using the very same analytical techniques once championed by Charles Jackson now defines a market in which prices are significantly above the opportunity costs of suppliers.

Haring & Jackson heroically attempt to explain away these rents as simply the resource cost of spectrum. This is analytically incorrect. FCC licensees own no spectrum and, more importantly, bid no spectrum away from an alternative use. To argue such, as do Haring & Jackson, is to misunderstand the FCC allocation process, on the one hand, and to *erase all* evidence of market power *anywhere* by simply redefining monopoly profits as "opportunity costs." In the

---

88 "Declaration of Arthur A. Schoenwald in Opposition to Defendant's Motion for Summary Judgment and Summary Adjudication of Issues," in *Los Angeles Cellular Telephone Company vs. State Board of Equalization, et al.*, No. 509737 Superior Court, Sacramento, California (30 April, 1990), pp. 24, 25, 27.

traditional microeconomic analysis, license values for cellular duopolists measure rents, not costs, and present policymakers with handy estimates of the degree of supra-competitive returns now being earned in cellular markets.

Haring & Jackson analogize to the real estate market, alleging that my Q ratio analysis of market power in cellular would produce "evidence" of market power in any competitively priced real estate development because it omits the resource cost of land (*i.e.*, spectrum). Their analogy is fatally flawed. The correct analogy would be to examine a development which has been set aside as one of only two parcels of land in the country where a certain sort of commerce may be transacted. The land is "cleared" for this particular employment by the government, which then assigns the rights to use such favorably zoned land (at zero charge) in two lotteries.[89] The rights are transferable. They are sold for prices reflecting not the opportunity cost of land, but the present value of anticipated profits accruing from exploiting a market protected from competition. If this duopoly right extends over a lucrative market, licenses will sell at a high price; if the licensed service is in very low demand relative to costs of supply, a small -- or zero -- price. The resource cost of land is simply irrelevant. The license-holder, after all, does not have to bid this land away from any alternative use; the land is appropriated into this use by government policy. To confuse the license value with the opportunity cost of land is to commit the famous "sunk cost fallacy" -- in broad daylight.

If I had calculated a Q ratio while leaving out the cost of an input which the firm must bid away from competing uses, I would have a problem. I did not. On the other hand, if we were to attribute all supracompetitive profits to the value of the land, then *any* monopolistic returns would escape our notice. In that the zoning permit which limits competition is worth a fortune,

---

89 The advent of auctions will not change the economic analysis. See argument *supra*, Section 3.2.

and is instantly capitalized into the price of the land to which such rights are attached, the duopoly land-owners could simply insist that they had no market power -- they had simply paid a bundle for their land, and hence their costs were very high. Alas, purchasing monopoly -- or duopoly -- rights is often an expensive proposition. Supra-competitive returns are the reason why.

CERTIFICATE OF SERVICE

I, Brenda Chapman, hereby certify that I have this 21st day of January, 1994, caused to be hand delivered copies of the foregoing "Errors In Haring & Jackson Analysis of Cellular Rents" to the following:

Mr. William F. Caton
Acting Secretary
Federal Communications Commission
1919 M Street, N.W.
Room 222
Washington, D.C. 20554

Chairman Reed Hundt
Federal Communications Commission
1919 M Street, N.W.
Room 814
Washington, D.C. 20554

Commissioner James H. Quello
Federal Communications Commission
1919 M Street, N.W.
Room 802
Washington, D.C. 20554

Commissioner Andrew C. Barrett
Federal Communications Commission
1919 M Street, N.W.
Room 826
Washington, D.C. 20554

Mr. Thomas J. Beers
Federal Communications Commission
Common Carrier Bureau
2000 L Street, N.W.
Room 357
Washington, D.C. 20036

James H. Bennett, Chief
Public Mobile Radio Branch
Federal Communications Commission
1919 M Street, N.W.
Room 644
Washington, D.C. 20554

John Cimko, Jr., Chief
Mobile Services Division
Federal Communications Commission
1919 M Street, N.W.
Room 644
Washington, D.C. 20554

Mr. Brian F. Fontes
Senior Advisor to Commissioner Quello
Federal Communications Commission
1919 M Street, N.W.
Room 802
Washington, D.C. 20554

Mr. Bruce A. Franca
Deputy Chief Engineer
Office of Engineering and Technology
Federal Communications Commission
2025 M Street, N.W.
Room 7002-A
Washington, D.C. 20554

Ralph A. Haller, Chief
Private Radio Bureau
Federal Communications Commission
2025 M Street, N.W.
Room 5002
Washington, D.C. 20554

Ms. Kathleen Levitz
Deputy Bureau Chief
Common Carrier Bureau
Federal Communications Commission
1919 M Street, N.W.
Room 500
Washington, D.C. 20554

Ms. Renee Licht
Acting Senior Legal Advisor
Office of the Chairman
Federal Communications Commission
1919 M Street, N.W.
Room 814
Washington, D.C. 20554

Mr. Byron F. Marchant
Senior Legal Advisor
Office of Commissioner Barrett
Federal Communications Commission
1919 M Street, N.W.
Room 826
Washington, D.C. 20554

Stephen Markendorff, Chief
Cellular Radio Branch
Mobile Services Division
Federal Communications Commission
1919 M Street, N.W.
Room 644
Washington, D.C. 20554

Kent Y. Nakamura, Esq.
Private Radio Bureau
Federal Communications Commission
2025 M Street, N.W.
Room 5002
Washington, D.C. 20554

Ms. Linda L. Oliver
Legal Advisor
Office of Commissioner Duggan
Federal Communications Commission
1919 M Street, N.W.
Room 832
Washington, D.C. 20554

Dr. Thomas P. Stanley
Chief Engineer
Office of Engineering and Technology
Federal Communications Commission
2025 M Street, N.W.
Room 7002
Washington, D.C. 20554

Mr. Gerald P. Vaughan
Deputy Bureau Chief
Common Carrier Bureau
Federal Communications Commission
1919 M Street, N.W.
Room 500
Washington, D.C. 20554

Ms. Karen Brinkmann
Special Assistant to Chairman Hundt
Office of the Chairman
Federal Communications Commission
1919 M Street, N.W.
Room 814
Washington, D.C. 20554