A separate 1992 GAO study surveyed cellular retail price data from 1985-1991 in the 30 largest U.S. retail markets. The GAO study found that, on average, cellular prices in the four largest California cellular markets were about 31% above those of other U.S. markets. Moreover, the average price difference varied by no more than about 3% between the two carriers in these markets.

LACTC reviews its own history of advice letter filings for rate reductions as a case in point of its sensitivity to regulatory restraints. During the initial period of cellular rate regulation prior to D.90-06-025, LA Cellular filed an average of about four rate reductions or promotions per year. Between D.90-06-025 and D.93-04-058, LA Cellular filed about 20 such advice letters per year. Once D.93-04-058 introduced Rateband Guidelines allowing rate reductions to become effective immediately, LA Cellular has filed the equivalent of 41 advice letters on an annualized basis. LA Cellular infers that cellular rates should fall even more if the remaining procedural barriers to rate reductions are removed.

b. Discussion

While we agree that observation of prices in isolation does not prove conclusively whether or not a firm or industry is competitive, such price data is a relevant criterion of market power when viewed in conjuction with other indicators. Based upon our review of cellular price patterns as compiled in connection with this OII, we conclude that cellular prices still remain higher than would be expected in a fully competitive market, notwithstanding cellular carriers' claims to the contrary. Our conclusion is consistent with the 1992 study of the cellular industry conducted by the US General Accounting Office which found that: "A market with only two producers--a duopoly market--is unlikely to have a competitively set price that is at or near the cost of producing the good." The GAO observed that many economists believe anticompetitive behavior is more likely to occur in industries with barriers to entry, such as cellular.

In interpreting price comparisons, we recognize that a variety of factors contribute to the comparatively higher rates, particularly in major metropolitan California cellular markets. As noted by DRA, those factors include high demand for cellular services, greater disposable income in the areas with the highest rates, greater population density, and a highly mobile population.[7] We agree with DRA that in addition to these factors, the lack of competition is a significant factor in explaining the high rates. In addition, most duopolists' prices for their basic service are very close to each other if not identical. The similar price levels of duopoly carriers for basic service raise questions as to price competitiveness. The tendency of duopolists to price their services equal or close to each other is corroborated by the 1992 GAO study of cellular prices. The study analyzed prices from 1985 to 1991 in the top 30 US cellular markets, based upon the best available price for 150 minutes of usage. The study found that duopolists set their best prices within 10% of each other in two-thirds of the markets.

Granted, we observed in D.90-06-025 that: "[i]n a fully competitive market, the prices of individual firms track closely and may even be identical." (P. 49.) Yet, while similar prices may be observed in competitive markets, we cannot assume that similar prices always indicate a competitive market. Particularly, in an industry with restricted entry, high demand, and declining equipment costs such as cellular, similarity of prices between two duopolists raise questions. For example, why haven't rates been bid down if, in fact, costs have dropped and competition exists? In California, the original rates -- largely basic rates for most carriers -- were set on what the market could bear at the time; that essentially meant rates were based on carriers' own projections. Rate of return and the actual cost of

7 See DRA letter to Senator Hershel Rosenthal as included in Attachment C of DRA Opening Comments.

providing cellular service were not seriously considered. The basic rates have been largely untouched since then. In the interests of maximizing profits, carriers had the incentive to set high initial basic prices. Because the cellular market was relatively new at the time we adopted a hands-off approach to regulating their rates, hoping the rates would come down in due time as economies of scale occurred and the cost of doing business declined (due to declining equipment prices and so on). In fact, as noted in the comments of CSI, while basic service charges have remained basically flat, the average cost of a cellular telephone has dropped from about $2,400 in 1983 to about $200 today, which equates to a monthly cellular cost drop from $79 to $7.[8] In terms of the total capital investment per cellular subscriber, the average industry cost of $1,816 in June 1988 dropped to only $978 by June 1993.[9] We find the disparity between declining costs versus flat prices for basic cellular service to be further evidence of an uncompetitive market.

Prior to this current investigation, we recognized that cellular rates within California were too high. In our investigation of the cellular industry in I.88-11-040, we intended to adopt measures as prescribed in D.92-10-026 in response to concerns over excessive rates (although we subsequently stayed those measures pending the outcome of this proceeding). Concern over high, uncompetitive cellular rates led the California Senate Committee on Energy and Public Utilities to hold a legislative hearing on January 12, 1993 on how the cellular industry should be regulated. On March 25, 1993, President Fessler stated in an Assigned Commissioner Ruling: "Cellular subscribers in California

8 The Cellular Service Industry: Performance and Competition, Charles River Associations, January 1993, as cited in Opening Comments of Cellular Service, Inc.

9 CTIA Mid-Year Data Survey, October 12, 1993 as cited in Attachment 3 footnote 4 of the CSI Opening Comments.

suffer the dubious distinction of paying among the highest rates in the nation. This situation is intolerable and must be changed." The price comparison studies of NCRA and DRA show that the high rates still have not come down for basic service in at least the Los Angeles and San Francisco markets (see Appendices 1 and 2).

Both proponents and opponents of regulation agree that cellular rates in major California markets have been higher than rates in major markets in other states. The dispute lies over the cause of the higher rates. Cellular carriers blame California regulation for the high rates while consumer groups and resellers view the high rates as evidence of market power and lack of competition among cellular carriers. Moreover, while cellular carriers blame regulation in defense of allegations that rates are too high, they take credit for any reduced rates achieved through various discount rate plans as evidence that competition is working. We reject carriers' claim that regulation--rather than duopoly market power--is to blame for cellular rates being higher in the largest California MSAs compared with other states. Carriers fail to explain why certain other MSAs and RSAs subject to the same regulation in California also exhibit lower rates than other markets outside of California. We previously addressed this claim in D.93-04-058 in reviewing cellular carriers' lack of willingness to reduce prices since the issuance of D.90-06-025, stating:

> "Three years later virtually none of the Commission's expectations [of reducing cellular prices] have been met by industry performance. While many urge that the fatal flaw is the expectation that duopolists will engage in meaningful competition, the industry has a different explanation as to why basic cellular rates in all segments of the California market have remained at their historic high levels. It is all the Commission's fault!...Because of a fear that once a price was lowered, the Commission would obstruct a movement back to the old level." (P. 4.)

Accordingly, we put this claim to the test by adopting rate band price guidelines in D.93-04-058 which gave carriers that lower their prices the flexibility to raise rates to previous levels on one day's notice without any required showing. Existing rate levels were to serve as a cap absent a justification for increases. With this added rate flexibility in place, we observed that it would quickly be known whether cellular duopolists would, in fact, lower their rates. Our review in this Investigation fails to show that carriers have in fact significantly lowered rates for customers as a whole in response to the Rate Band Guidelines.

In April 1994, we issued D.94-04-043 which further relaxed and simplified the rate regulatory requirements for cellular carriers. That decision removed the 10% maximum reduction for temporary tariffs so the rates could be dropped to any level on one day's notice. The decision also allowed the utilities to provide provisional tariffs (new service plans with termination dates) and to withdraw optional plans without CPUC approval, assuming proper customer notice requirements are met. The decision also allowed automatically renewable contract services which had violated CPUC rules and policies to remain, providing certain changes were made in the tariffs. These changes included proration of termination penalties over the life of the first-year contract, elimination of the termination penalty after one year, maximum three-year contracts, customer signatures on contracts with penalties, and customer notice prior to contract renewal.

While our rateband price guidelines have led to some lower prices, the carriers' statistics exaggerated the extent to which prices have been lowered. As noted in the reply comments of CSI, for example, while Airtouch claims that prices were cut by a variety of carriers in 15 separate advice letters under the Rate Band Guidelines, only two remained in effect at the time of the OII

comments, and one was due to expire March 24, 1994. Of the 31 tariff filings cited by LACTC in its comments, only five actually reduced rates. Of 21 LACTC advice letters filed under temporary tariff authority, only five involved rate reductions and only of a temporary nature. US West's example of the Wholesale two-year contract involves a cash-back program which is the subject of a Utility Consumers Action Network complaint of unfair business practices now pending before the Commission. All of the plans require long-term commitments enforced by high termination penalties for changing service.

Moreover, even though the cellular rates of major California carriers remain among the most expensive in the nation, as indicated by the NCRA study, at least they have not significantly increased their rates. By comparison, the NCRA study shows a 32% average increase in cellular rates among the 30 largest carriers between 1988-94. We believe that the presence of regulation in California served as a restraint on carriers' tendency to raise rates when compared with carriers in other states which do not regulate carriers.

Moreover, even if it were assumed that discount rate plans may have lowered certain targeted customers' cellular phone bills, such purported savings do not, in themselves, signify competition. A price discount plan may simply be a response to a perceived change in consumer demand patterns, technological changes, or reduced marginal costs, having little or nothing to do with responses to competitors. In fact, growing use of discounted rate plans is coinciding with declining per-customer demand among new cellular customers. Thus, cellular carriers rates appear to be bumping up against cellular customers who will only use the service more if rates are lowered. During the earlier years prior to such widespread use of the discounted rates plans when the cellular market attracted business customers with relatively inelastic

demand and high usage, high cellular rates were more readily tolerated by subscribers.

Moreover, it is questionable as to how much discount plans really lower overall costs of service in any event. For example, if competition was really driving rates downward, why haven't basic service rates dropped appreciably? It is wrong simply to treat the price difference between the discount plans and basic service rates as "savings." It is an apples/oranges comparison which ignores differences in the terms and restrictions among the different billing plans relative to basic service. The proper comparison of cellular rates is between the total package of terms and conditions applicable to each payment plan under which the customer receives service. The purported savings in usage rates must be offset against the opportunity costs related to caller restrictions imposed under the plans. We must also consider the rate impacts on users who do not select a discount plan, or who select a plan which does not yield an optimal bill given their calling pattern. Even based upon the figures used in the CCAC study, a significant number of customers still receive service under Basic Service plans. Among small cellular markets in CCAC's study, over 80% of subscribers were on Basic Service in 1993.

As another approach to testing whether current levels of cellular prices are high due to market entry restrictions, we can consider studies which simulate how prices would change in the event that additional entrants were allowed in the market. Such a study was done by Kwerel and Williams (K&W) in November 1992 for the FCC.[10] K&W concluded that based on a simple theoretical model

10 See the study of Evan Kwerl and John Williams, "Changing Channels: Voluntary Reallocation of UHF Television Spectrum" (FCC: OPP Working Paper 27; November 1992.) This study was referenced in the comments filed by Nationwide Cellular Service, Inc. in this proceeding.

of oligopoly pricing and empirical evidence from other industries, cellular prices could be expected to fall 25% as a result of introducing a third cellular carrier. Likewise, a study by Morgan Stanley, a Wall Street investment analyst, simulated different assumptions as to the degree of competitiveness in the cellular industry. This study concluded that cellular prices would decline as a result of market entry of more competitors.

In addition to the cellular pricing data submitted by parties as part of their filed comments, the ALJ directed various carriers to submit supplemental data regarding prices charged under both their basic service and discount rate plans for periods back to 1989. In response to the ALJ ruling, parties provided the data on a confidential basis under Public Utilities (PU) Code § 583. We have analyzed the pricing data provided in response to the ALJ ruling, and conclude that it further corroborates our conclusion that cellular carriers' prices remain uncompetitive.

As stated in the OII, our focus is on price competition at the wholesale level. While the cellular resale market contains an ample number of firms, resellers are captive to the facilities-based carriers for purchase of wholesale blocks of service. Accordingly, resellers' ability to compete at the retail level is significantly constrained by the wholesale prices paid to facilities-based carriers.

4. Do Cellular Carrier Profits Indicate the Failure of Competition?

Another measure of a dominant firm's market power is the comparison of its costs of service relative to prices it extracts in the marketplace. To the extent a cellular carrier can keep its prices high relative to costs, it can command a more lucrative profit on invested capital. If a cellular firm earns returns

consistently above those of other firms of similar risk, this is an indicator of market power.

Parties present divergent views on the significance of cellular earnings as an indication of market power, and whether earnings are unreasonably high. Consumer groups and resellers argue that cellular carriers in California earn supranormal profits which indicate lack of competition. CRA, for example, presented 1992 profit data for 17 California cellular licensees. The average after-tax return for all carriers presented was 47.1%. (Table 1; Reply Comments.) Ten of the 17 carriers earned returns in excess of 25% on wholesale service and five earned returns in excess of 40%. CRA believes that in D.92-10-026, the Commission found that 14.75% is a reasonable after-tax rate of return for unbundled wholesale tariffs (Finding 62). CRA computes the equivalent pre-tax return as 25% (assuming a 40% tax rate). Assuming that 25% represents a reasonable pre-tax return, CRA computes that the combined 1992 earnings of California cellular carriers which were in excess of a 25% return amounted to $233 million (see Table 2 of CRA comments).

Northwest Cellular Service, Inc. provided the study of Thomas Hazlett, concluding that the high profitability of cellular carriers nationally indicates market power and lack of competition. Hazlett points to the capital investment market as one of the most compelling indicators that the earnings levels of cellular carriers exceed those of a competitive industry. Because capital market investors are bidding on assets with their private resources, analytical arbitrariness is removed, according to Hazlett. To measure the valuation of cellular markets on this basis, Hazlett computes a "Q-ratio." (A financial valuation index that measures the relationship of a firm's (or industry's) capital market value in relation to the replacement cost of its assets.) Hazlett states that in a competitive industry, the Q ratio is about 1.0.

For New York Stock Exchange firms, the average Q ratio has been slightly below one in recent years. No industry examined in a recent Brookings Institute study of 20 US industries had a Q ratio over 3.24 during the 1961-85 period, with the next highest Q being 1.9. Over the entire period, the Q ratio was 1.28. By contrast, based on 1991 data from the National Telecommunications and Information Administration, the Q ratio for the cellular industry varies from between 6.68 and 13.52 depending on firm size. (See Table 4 - p. 14 of Hazlett.)

In the 1992 K&W study, the level of net profit of cellular carriers was measured to exceed 50% of revenues. Referencing the operating data compiled by the Federal Congressional Budget Office, Hazlett observed that of the average subscriber bill of $80/month, only $20 goes for operating expenses while $60 goes for profits. Hazlett concludes that such high residual profits can only be sustained through restriction on market entry of competitors who might otherwise bid down prices to gain market share.

The cellular carriers argue that cellular earnings data is not a meaningful indicator of market power. US West noted that the CPUC has previously considered earnings levels as a potential indicator of market behavior in its Investigation of the interLATA telecommunications market (D.87-07-017). But in that proceeding, the CPUC determined that the relevant earnings measure was marginal return on replacement cost investment, and that such measure was not available. As such, the CPUC concluded that information regarding current recorded earnings was of limited use. US West gave as additional reasons for not using earnings as a market power measure: (1) the volatility of revenues and expenses within the industry; (2) the lack of a benchmark rate of return for firms facing similar risks against which "excess" earnings could be measured.

The cellular carriers such as LACTC also note that the earnings of cellular carriers within California vary significantly among each other, and attribute these differences to individual carriers' management efficiency. LACTC argues that it would penalize productivity and encourage inefficiency if carriers with high returns were forced to lower their rates to yield lower returns commensurate with less efficient carriers.

LACTC further contends that to the extent the Commission still insists on questioning cellular earnings, the seemingly high profit levels of some carriers are only indicative of market acquisition costs of scarce cellular licenses. The earnings shown in annual reports filed with the CPUC do not generally account for these acquisition costs as an asset. When these acquisition costs are added to the investment asset base, the investment base goes up and the derived return on investment goes down.

As explained by LACTC, the FCC originally allocated cellular spectrum into a "B" Block for the exclusive use of wireline companies already present in the particular market, and an "A" Block available for all other users. This allocation resulted in a large number of "A" Block license applicants in each market. These licenses were awarded based upon lotteries and quasi-forced settlements. Subsequently, the value of the "A" Block licenses were bid up, often by substantial amounts, through a series of ownership transfers in which fragmented ownership of cellular licenses were consolidated. The price paid for a cellular license reflects the present value of investors' expected future earnings which are anticipated from owning the license in a particular market. The cellular carriers attribute the high expected future earnings merely to the explosive growth in demand associated with a new technology within a populous, highly mobile state. They deny a link between the value of the licenses and duopolistic market power.

LACTC states that the acquisition cost for cellular licenses have historically ranged as high as $300 per POP.[11] Hypothetically, even if a more conservative value of $100 per POP is assumed for the Los Angeles market, and $1.4 billion were added to the investment base in the LACTC 1992 Annual Report, the overall after-tax rate of return would drop to 7.3%.

McCaw disputes claims that cellular carriers earnings are excessive by presenting pro forma earnings calculations imputing a value for cellular spectrum based upon amounts paid for SMR spectrum. We address the merits of McCaw's claims as to spectrum valuations and earnings impacts in our discussion below.

In their paper critiquing Hazlett's study of cellular profits, Haring & Jackson[12] characterize the the high rents associated with cellular carriers as merely being the "opportunity cost of spectrum" or the "resource cost of airwaves" which are allegedly ignored in Hazlett's derived Q ratios.

By contrast, CRA contends that the high value of the cellular license is attributable to the market power it offers the holder. Since only two licenses are issued per market area, potential competitors who might otherwise enter the market and offer lower prices are precluded from doing so. If these markets permitted free market entry, entrepreneurs would take note of the above-market returns being earned by cellular carriers particularly in large markets such as LA and San Francisco. The price of

11 A "POP" refers to the Proportionate Population Equivalent, representing a means of measuring population residing within a telephone market.

12 The paper of John Haring and Charles Jackson was referenced in the Hazlett papers submitted by Nationwide Cellular, but not provided. In the ALJ ruling of April 11, 1994, Nationwide was directed to supplement its comments by providing the Haring & Jackson Paper, which they did on April 28, 1994.

cellular service would be bid down to levels that generate profits roughly corresponding to those of enterprises in other industries having corresponding risks.

a. Discussion

We conclude that the earnings of cellular carriers are relevant to an assessment of market power. As is true with cellular prices, cellular earnings data must be interpreted carefully. The market and technological characteristics of the cellular industry are different from those of other industries which we regulate, and we would not necessarily expect to see rates of returns which are uniform among different industries or among individual firms within the cellular industry. Nonetheless, we conclude that the level of earnings of many cellular carriers have been excessive and further indicate insufficient competition to keep prices in check.

As a basis for our findings, we have considered not only the earnings data submitted in parties' comments, but also our own review of carriers' earnings dating back to 1989, as reported in the annual reports submitted to this Commission.

While firms generally are expected to earn returns commensurate with their risk, we find no evidence that the risk faced by cellular firms justifies such high returns as those earned in the major metropolitan markets. On the other hand, in Phase II of I.88-11-040, DRA found that cellular carriers' returns exceeded returns of industries with comparable risks.[13]

In our review of market power in the interLATA telecommunications market D.93-02-010, we considered rate of return measures as an indicator of competition. On the one hand, we

13 See DRA's August 11, 1989 Phase II Comments on Regulation of Cellular Radiotelephone Utilities, p. 4-25 (as cited in its reply comments in this proceeding, p. 7).

observed that "[r]ates of return vary for many reasons and do not per se indicate the absence of effective competition." (D.93-02-010 at 49). Likewise, we pointed out in D.90-06-025 that:

> "Accounting rates of return for wholesale carriers do not in themselves reveal whether profits are due to a scarcity of available radio spectrum, uncompetitive pricing, or the ordinary returns on investment that may be earned due to the riskiness of the cellular industry."

Nonetheless, while we avoid arbitrary presumptions about the causes of carriers' rates of return, that doesn't mean that we should ignore earnings data in assessing the market power of cellular carriers. As we have stated previously:

> "Instead of ignoring the rates of return, we believe that they are reliable indicators of a competitive market, especially if there are consistent patterns in earnings over time, and are viewed in tandem with other measurements of market power." (D.93-02-010 at 35.)

Accordingly, we are interested in reviewing patterns in cellular carriers' earnings over time and relative to other investment options as a basis to assess market power. In a competitive market without entry barriers, excessive returns above competitive levels would tend to attract new competitors seeking a share of the lucrative returns. As more competitors entered the market, they would progressively bid down prices until a market-clearing level of expected earnings was reached.

The question is what range of returns would be associated with cellular carriers assuming their earnings were constrained by a competitive marketplace? As we previously concluded in D.90-06-025, the cost structure of the cellular industry does not lend itself to uniform measures of expected earnings levels. As we stated in explaining the problem of

applying traditional rate of return regulation in the cellular industry:

> Carriers differ in their numbers of customers, precise service areas, equipment, and in numerous other characteristics that affect costs. We would be faced with setting different prices or different allowed rates of return; the former would artificially bias the market towards one carrier while the latter could be attacked on fairness grounds."

We acknowlege that the total earnings of any given carrier can vary significantly from one MSA to another. In a few cases, even net deficits have been reported in some years. Yet, the returns earned by carriers in the largest metropolitan areas representing the majority of California consumers have been consistently high over several years. Differences in earnings among carriers and MSAs can be attributed to a variety of factors including population density and mobility, commuter traffic, geographic factors, management quality, and changing technology. Another factor, particularly in earlier years, is the age of the carrier and how much time it has had to establish itself in the market. Not surprisingly, the highest returns tend to be earned in those MSAs with the greatest population density. But undeniably, another essential element explaining the high returns in certain regions is that the large wholesale cellular market in these regions is shared by only two duopolists.

We also recognize that there is a scarcity value related to the limited amount of spectrum available for cellular transmission, and some portion of cellular profits can be attributed to this scarcity factor. As we observed in D.90-06-025:

> "if cost-of-service calculations produced prices that did not account for the scarcity value of the license, then systems would become overburdened with subscribers; the resulting degradation in service quality and potential need to ration the service would impair economic efficiency." (P. 16.)

As to what constitutes excessive returns indicative of the improper use of market power, we observed in D.90-06-025 that prices charged above marginal costs were not per se improper to the extent that cellular carriers used the profits to expand capacity and increase service availability to the public. We concluded therefore that "profits earned due to the scarcity of available radio frequencies are best left to the carriers" and promote economic efficiency. (P. 15.) On the other hand, we distinguished "profits due solely to a failure to compete in a duopolistic market" as improper. We stated that there is an incentive for carriers not to compete vigorously when new entrants cannot join the market to undercut monopoly-type prices. Evidence of such improper pricing would be the pricing of cellular services so high as to discourage full utilization of the system, or failure to invest in system expansion when it is economically justified.

The cellular carriers deny that they have restricted output to achieve monopoly-like profits, but instead have expanded their systems significantly over the past 10 years. There is no question that growth in cellular subscribers has been dramatic and rapid by comparison with other industries. But such expansion does not, of itself, prove that cellular carriers have priced their services competitively. Rather the rate of system expansion is more indicative of the fact that the industry is still very young, and the intrinsic demand for mobile telephone service in California has been dramatic. We conclude that pent up demand for mobile telephone service in California has been inherently strong in spite of--not because of--the level of cellular prices. Thus, the question is not whether cellular systems have expanded over time, but rather, how much more rapidly demand would have grown had it more fully utilized potential cellular system capacity and not been inhibited by uncompetitive prices. It is an uncompetitive price that acts to restrain output by limiting demand to those customers who are able and willing to pay the prices required by the cellular

carriers. Even with the substantial growth in cellular usage over the past decade, still only about 5% of the California population uses a cellular phone.

Accordingly, if cellular carriers' pricing levels were a result of spectrum scarcity, this would imply they are already serving at maximum capacity given the scarce FCC-spectrum which they are licensed to use. If prices were further reduced below the level associated with maximum capacity demand, then demand could be overstimulated beyond the available supply of calling capacity. Thus, to avoid a rationing of service, or risk of service interruptions, it would be appropriate for cellular carriers to keep profits resulting from pricing service to attract demand only up to the limits of available capacity.

On the other hand, it is not appropriate for cellular carriers to set prices at a level which restricts demand for the service by raising prices above the scarcity value of the spectrum in order to enhance profitability at the expense of competition. As noted in the K&W study, cellular carriers can increase their effective capacity in various ways. One constraint on capacity is the allocation of radiowave spectrum within which a carrier can operate under its FCC license which assigns 25 MHz of spectrum to each of two competing carriers per service area. Within the the allocated spectrum, the carrier has available a fixed number of radio frequency channels per cell site. Within the constraints imposed by 25 MHz of spectrum, the carrier can further increase system capacity by cell division. By reducing transmitter power, and hence cell size, the same frequency can be reused at closer distances. Doubling the number of cells would double the number of potential users. This approach entails additional costs for more cell sites and links between the cell equipment and the MTSO.

Another way to increase system capacity is by increasing the number of voice channels per radio frequency channel. While analog cellular systems require one radio frequency

channel for each voice channel, digital systems can provide six or more voice channels per radio frequency channel.

The most likely carriers to have reached full capacity would be cellular carriers in the most populous region of the state, Los Angeles. LACTC argues that for its own system, system coverage and capacity has expanded "as quickly as humanly possible" since 1987. During this period, its investment has grown by a factor of about 10 while its end user units have increased from 17,000 to about 500,000 units in service.

Yet, even assuming that capacity is a constraint in parts of the LA market, this is not a state-wide condition. As DRA 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 other California cities. Clearly, capacity is not a constraint for expansion; cellular prices are." (DRA Memo quoted in Nationwide Comments, p. 32 fn.)

Even here, capacity is constrained not by physical limits, but by reluctance to make additional investment which would otherwise reduce high duopoly profits. Likewise, the national average density of systems, measured by subscribers per cell site, rose from 372 in December 1985 to 962 in June 1992. This increasing density does not indicate capacity has been constrained or that potential demand was being fully served through this period. Instead, there is indication that additional customers could have been added to cellular systems had prices been lower. Moreover, the data on capacity utilization submitted in response to the ALJ ruling in this proceeding further corroborate that capacity remains available to expand the cellular customer base.

Accordingly, excess earnings cannot be explained away as due to scarcity of spectrum or avoidance of rationing service.

Similarly, excessive earnings of cellular carriers cannot be justified by virtue of the high costs incurred for a FCC cellular license franchise. We conclude that the FCC license value, particularly of the larger California cellular markets, cannot be attributed merely to inherent scarcity of spectrum. The FCC license conveys the exclusive right to utilize particular frequencies of spectrum to sell cellular telecommunications services in a prescribed area. The license has a value to market traders at a level approximating the discounted present value of the rents flowing from entering the restricted market. The fact that cellular license values reflect more than scarcity of spectrum is evidenced by comparison with the license value of other spectrum allocations. If spectrum scarcity was the only or primary determinant of license value, we would expect the value per-MHz of licensed spectrum to be roughly equivalent when compared nationally. Yet, on a national level, a 1991 NTIA Report deduced the present value of duopoly profits as established by the financial markets for cellular licenses at $80 billion. As a point of comparison, the aggregate value of cellular licenses utilizing 50 MHz of nationwide spectrum space are over seven times the transaction value for all the licenses utilizing the 400 MHz of spectrum space allocated to radio and television broadcasting, for a market price differential of 62 times (on a per-MHz basis). Likewise, while the CBO estimates a valuation of $7.2 billion for PCS licenses to use 120 MHz of spectrum is dwarfed by the $80 billion value of cellular licenses to use only 50 MHz of spectrum.

Thus, while the reported returns of cellular carriers in annual reports filed with the Commission do not include the capitalized value of FCC licenses, it is wrong to simply include the full license value in the investment base as an opportunity cost of market entry to reduce apparent profit return in assessing

market power. Otherwise, any entry barrier can be erased as a source of duopoly profits and simply turned into a "cost of doing business" through reclassification as a capitalized investment. Such reclassification masks the duopoly profits we are seeking to identify. Accordingly, the pro forma calculations of carriers such as LACTC which computes a pro forma 1992 return of only 7.2% (instead of a reported return of 51.6%) are unrealistic in assuming that the full market valuation of a license should be capitalized for assessing market power profitability.

As noted by Hazlett (Nationwide comments), cellular carriers do not "own" the airwaves as a resource cost. Rather, the airwaves are public property held in trust by the federal government. The Communication Act of 1934 made the federal government responsible for management of the radio spectrum through the issuance of licenses for its private use. These licenses were to convey merely the right to use the radio spectrum consistent with the public interest. Accordingly, the mere fact that a carrier has paid substantial sums for a cellular license does not entitle the carrier to unrestricted opportunity to recover excessive prices from consumers to compensate for expensive licenses.

McCaw attempts to demonstrate that cellular carriers do not earn excess profits as a result of market power through hypothetical earnings adjustments discussed on pages 17-19 of its reply comments. McCaw's calculations purport to show that California cellular carriers' pre-tax rate of return would be below 25% if the investment base were increased to include a valuation for cellular spectrum at levels shown in its hypothetical scenarios. Yet, we find that McCaw's hypothetical earnings calculations to be based on a number unproven, questionable assumptions that fail to show that excess earnings can be simply dismissed as evidence of market power and attributed fully to spectrum scarcity. We discuss McCaw's premises below.

One of the premises assumed in McCaw's calculations is that the the cost paid to acquire SMR spectrum provides an equivalent measure of "uncontaminated" cellular license value free of excess profits due to market power. McCaw bases this assumption on a statement made in the Wireless OII. In this regard, the OII stated that:

> "One way of assessing the value of spectrum for mobile telephone which may be much freer of monopoly power value "contamination" is to look at the sale prices of SMR licenses that are being converted to public telephone use. While a rough indicator, the price that an additional market entrant is able and willing to pay to acquire SMR spectrum may approximate the value of cellular spectrum." (P. 22) (Emphasis added.)

McCaw derives a value representing SMR spectrum inferred from the acquistion by MCI of a 17% interest in Nextel, assuming this is a correct proxy for "uncontaminated" cellular spectrum value. Yet, as McCaw, itself, recognizes, the OII's statement is merely a "suggestion," not a tested prescription for determining cellular spectrum valuation. The OII's suggestion that SMR spectrum values may be a closer approximation of "uncontaminated" spectrum value does not imply Commission endorsement for using the SMR price as a straight substitute for a reasonable cellular spectrum valuation. As the OII warns, the SMR spectrum value is a "rough approximation." Before meaningful conclusions could be drawn regarding "uncontaminated" spectrum value based on pro forma cellular rates of return adjusted for SMR proxy spectrum values, a much more involved analysis of the factors underlying cellular spectrum value would be required. The difficulty in quantifying a proper value for cellular spectrum and the impetus not to undertake such a resource-intensive study is one of the factors leading us to reject cost-of-service regulation as a viable option for cellular carriers.

Moreover, even if the prices paid for SMR spectrum were assumed to constitute a correct reference point for "uncontaminated" cellular spectrum, it is not clear that McCaw's representation of a value of $42 per POP is necessarily ascribable only to SMR spectrum. McCaw derives the $42 value for SMR by subtracting the value of Nextel's tangible assets from the total capitalization of the corporation implied in the MCI transaction and then dividing by the number of POPs served by the Nextel System. McCaw thus assumes that all MCI acquisition cost in excess of tangible assets constitutes payment for SMR value. Without further analysis of the terms and conditions of the MCI transaction, we cannot confirm whether there may be other intangible strategic benefits implied in the value paid by MCI for its ownership interest. For example, while McCaw states that MCI paid no control premium with only a 17% interest, MCI may have expected to realize some strategic advantage relative to later investors and incorporated this into its payment premium.

McCaw's adjustment of the SMR value of $42 per POP up to $100 per POP for the equivalent cellular spectrum is likewise questionable. McCaw bases this adjustment on the premise Nextel typically holds less than half the bandwidth of a cellular carrier. Yet, as discussed previously, we have concluded that control of a certain bandwidth is not necessarily an accurate criterion for defining a carrier's market dominance. Many factors affect the price per POP besides bandwidth including the USE to which the spectrum is to be put and market conditions. Thus, we cannot accept the adjustment from $42 to $100 per POP as a supportable translation from SMR to cellular spectrum value.

Yet, for arguments sake, even if we accepted McCaw's hyypothetical equivalent market value of $100 per POP for cellular after adjusting for the bandwidth difference relative to SMR spectrum, we still find that the actual value investors are willing to pay for cellular spectrum, using McCaw's own figures, is double

the $100 value that McCaw would equate to "uncontaminated" spectrum, or $200 per POP. McCaw fails to explain what, other than expectations of higher future earnings from duopolistic market power, would induce an investor to pay twice the amount for cellular spectrum relative to the same bandwidth equivalent of SMR spectrum.

McCaw also bases its rate of return calculations on the annual reports filed with the Commission by cellular carriers. Yet, the returns computed in these reports are simply predicated on the invested partnership capital as reported. Such reported returns fail to account for the financing source of the underlying partnership capital contributions. To the extent the corporate partners use leveraged funds to finance the cellular partnership, the actual equity funds invested would be only a fraction of the total partnership capital. This means that the actual leveraged return realized by the individual partners would be greater than the reported return in the annual reports. McCaw fails to account for this in its calculations.

As a result of concerns such as these, we cannot accept McCaw's hypothetical pro forma earnings calculations as evidence that no excess earnings exist due to cellular carriers' protected market status. Rather, we find the disparity between the $100 per POP value resulting from McCaw's own calculations of "uncontaminated" spectrum value and the $200 per POP market value actually paid for cellular spectrum, if anything, to support a finding of excess cellular profits relative to SMR.

We also find that the Q-ratio analysis of cellular earnings presented in Hazlett's paper offers additional persuasive evidence that cellular profits far exceed any reasonable expectations of a competitive industry. Even allowing for the potential for error in Hazlett's specific calculations, the sheer magnitude of the difference between the cellular industry and other investments is enough to dramatize the point. As Hazlett notes, no

industry examined in a recent Brookings Institute study of 20 U.S. industries was found to exhibit a Q ratio of 3.32 during the 1961-85 period. By comparison, the cellular telephone industry ranged between 6.68 for small firms up to 13.52 for large firms. Although the sampling of cellular firms was from throughout the U.S., we consider the statistics relevant to our study of California firms, particularly since the L.A. and S.F markets are among the highest in the nation.

The fact that cellular licenses incorporate duopoly rents in excess of scarcity value is further borne out by the independent opinion of Wall Street analysts. As a 1991 Morgan Stanley report advised investors:

> "Investing $170-$200 per pop, or more--a valuation that many analysts suggest is warranted--in a business that requires hard assets of less than $20 per pop is justified only if there are enormous returns, and such returns are possible only in an unregulated monopoly or shared-monopoly business.[14]

Likewise, a major cellular carrier, LACTC, while discounting the significance of earnings measures in its comments filed in this Investigation, acknowleged that high profits underlying its license value are indicative of market power in a separate 1990 property tax proceeding before the State Board of Equalization. LACTC's expert witness testified in that proceeding as follows:

> "[C]ompanies in a competitive industry have no particular or material license value. If the market for cellular telephone

14 Edward M. Greenberg and Catherine M. Lloyd, Telecommunications Services. POP Out: The Changing Dynamics of the Cellular Telephone Industry (New York: Morgan Stanley; April 1991, (cited on p. 15 of Hazlett Paper/Nationwide Cellular Comments.

> 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 ...cellular telephone [market] ...is a special form of monopoly or oligopoly called a duopoly. The situation is the result of the FCC limiting to two the number of cellular 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.
>
> "It is necessary to understand how the bidder would determine the price or the recipient would determine the value of the FCC license being acquired. In either case, one would calculate the earnings from the business which can be generated under the monopoly condition. These earnings would be greater than ...under the competitive market structure and ...associated solely with the ownership of the FCC license."[15]

b. Conclusion

Based upon the factors considered above, we conclude that the earnings levels experienced by cellular carriers in the major California markets are indicative of a failure to compete effectively. The studies conducted by federal agencies and by market analysts indicate that prices would drop with increased entry into the cellular market, thereby implying that existing prices are higher as a result of restrictions on competitive entry.

15 "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.