Tom Hazlett:OK. Well, there we go -- yet further evidence that PowerPoint makes you<br/>stupider. I now understand that second graders are doing assignments in<br/>PowerPoint. And, in fact, friends of ours recently bragged that their<br/>daughter was using PowerPoint in her second-grade class. And, you<br/>know...they had obvious enthusiasm. I didn't want to say anything, but<br/>anyway...here we go. This is the crack cocaine of MBA's PowerPoint.<br/>Thank you for that nice introduction and it's -- and, of course, it's a great<br/>honor to be in this august group of speakers. I saw the program for this<br/>class and I thought, wow, is this the list -- that list of people I wrote down<br/>that I was trying to get to come to George Mason? And, I understand, I'm<br/>not on the starting lineup here, but --

Male Voice: [unintelligible]

Tom Hazlett:

-- coming off the bench is a great honor, so...And, I hope that you might get Henry Goldberg out here too because, certainly, if I can, I would love to come and hear him talk about spectrum policy and so forth. We just ran a rather ambitious experiment in network regulations since the 1996 Telecommunications Act, certainly, and I guess you have talked a little bit about the Telecom Act. And, you know...this was sort of grand compromised -- 20-some years in the making. And, it was supposed to be a way to introduce competition in both local and long-distance telephone service in sort of one fell swoop.

And, one of my coauthors, Bob Crandall, at the Brookings Institution, and I think he is still mad at me for getting him to a write a paper about three years ago that said that the Telecom Act wasn't all that bad if you compared it to other legislation, if you compare it to the '34 Communications Act, the '27 Radio Act, and the 1984 Cable Act. It probably -- or the '92 Cable Act -- it's probably OK. So, I assure Bob that we're on the same page. I just have lower standards than he does. But, you know...this debate about the effects of the '96 act will go on for sometime, and certainly in academia. But, already, we, you know...in the world, we see that both the political market and the economic markets have gone through some tumultuous cycles. And, we're already to some stage beyond, certainly, the stage that was defined by the '96 Telecommunications Act, although that act still remains very, very important. And you know...it is important to recall that the, you know...Telecom Act did do three things, essentially, in local telecommunications that individually were all quite important.

First, it abolished state monopolies for telecommunications and it's good to remember that, as recently as 1996, most states had monopoly franchises for local telephone, voice telephone service. And, this was a federal preemption. It was certainly a violation of federalism, a rather violent violation of federalism, because state-regulated telephone service is really a state-intrastate kind of a thing. But, this was important, and it allowed this burgeoning competition that had been seen for some years as, it was called regulatory bypass by economists, but it really was a form of bypass. And, even, you know...business people in the market place called it bypass, these -- the CAPS, the Competitive Access Providers, would literally route traffic from data-intensive users around the local telecommunications infrastructure, which was the regulated sector, and the monopoly-regulated sector, and take that traffic to competitive service providers, and long distance service providers, or data networks. And, so, companies like Metropolitan Fiber Systems and [Telefort], it actually carved out a pretty good little business there.

So, there became a viable business proposition and that went on from the late 1980s. And, so, this idea of natural monopoly in the local telecommunications loop really was quite strong as of the middle 1980s. I remember being in debates with people about cable TV policies and the *coup de grace -- coup de grace* in 1987, when talking about potential competition between cable operators was "Oh, and I suppose you are going to advocate competition in local telecommunications too?" You know...I mean that was, you know...code for who's drinking the Kool-Aid, you know...And, of course, I was, you know...I drunk a lot of Kool-Aid. So, I said, "Yeah. Yeah. I would love the phone companies to compete, too. That would be a great idea."

So, you know...this idea in 1996 that we abolish these state franchise monopolies, that actually was interesting to get a federal intervention. Actually, as soon as it came to actually eliminate those state monopolies, assuming meaning that there may not have been a consensus, you know...someone said there's still not a consensus, that you can have competition in a local loop. I think that's wrong. I think there is a consensus and, certainly, it's a worldwide consensus in my opinion.

But, anyway, the feds actually got in front of that one and that was an important aspect of the law. And, in fact, it may be the most important enduring aspect of the law. Secondly, it mandated interconnection between rival telecommunications networks. And, this is not, certainly, the same as unbundling. In some respects, it seems similar. But, the simple idea of interconnection is that a large network has to exchange traffic with a small network. And, this does allow the small networks to become part of the mix and to establish themselves. And, it turns out that interconnection rules are far less onerous, and interesting, and challenging to craft than are the mandatory network-sharing rules, where one network actually carries the traffic for another network. But, this is just the idea that networks will hand off to one another so that, if you're a small network and you have a few customers that might want to reach the customers of larger networks around so that you can get established. So, interconnection has actually been a mandate in the '96 act that has not been controversial, by and large, and you see a lot of interconnection in a lot of markets that is completely unregulated. Wireless is, you know... substantially of that genre.

Then, the third thing that the Telecommunications Act did in the local loop was, of course, to setup the legislative instructions for the regulators at the Federal Communications Commission, and the states cooperatively, to give a little jump start to competition. This idea that there should be competition in local phone service, obviously, was a radical idea in 1996. And, this was the fallback, the safeguard, to make sure that this thing can really happen when we're not really sure that anybody is going to start building new telephone networks on top of the current ILEC, the Incumbent Local Exchange Carriers. We're going to allow the regulators to drop some rules that say that the new networks can actually get established simply by renting capacity on the existing carriers. And, so, that became known as mandatory unbundling or as I call it, generically, mandatory network sharing.

There is, obviously, a lot of network sharing that goes on at all levels without mandates. The important point here is that the mandates are being instituted to try to help new competitors to get established in markets. And, so, that was really the controversial part of this. And, so, this setup of basic economic issue that some might even call a metaphysical issue, as it came out, because it became a rather heated debate. And, being an economist, I think, of course we deal with hard facts and science and the philosophers deal with other things. I always remember H.L. Mencken's aphorism that every philosopher spends his day proving that every other philosopher is an ass, and he always succeeds. Anyway...Competitive networks, how do we get them? This is the twoor three-hundred-billion question. Do we go inside-out, meaning that in the short to medium term, we're not going to realistically see a lot of head-to-head overbuilding, the great majority of the cable industry came up with some years ago for a competitive cable network? Are we going to see side-by-side competitors, meaning that new capital is poured in and sunk literally and figuratively in rival telephone exchanges?

Or, do we -- which I would call an outside-in policy, that new capital comes into the market -- or do we start with what have, which is a local exchange monopoly, and then use that monopoly with some encouraging mandates here to host multiple competitors? And, hopefully, over time, those new competitors that materialize as resellers to begin with will branch out and find it in their interest to build out their own networks. Now, it's crystal clear that everybody believes in the long run we want to end up with competitive networks. But, nobody is really saying that it's a good idea to have these network-sharing mandates simply supervise a sharing amongst competitors of a given network. And, why not? Well, I'll talk about that in a second. I got another slide on that.

Anyway, I wanted to sort of bounce off the side pocket, the side here just to get back to the -- to where I want the ball to end up. Look at the Brand X decision. This is not telecommunications per say. This is the cable modem decision that just came down in June. And, so, what happened there was that the Supreme Court upheld the FCC. The FCC rules said that cable operators were not required to share their networks with their rivals, other ISPs, maybe EarthLink, or AOL, or Microsoft network that might want to provide retail services for high-speed Internet access. And, a company like EarthLink wants to use, say, Comcast cable infrastructure to provide that service, and would like to get low regulated rates to do that, rather than negotiated rates. Obviously, they can negotiate if they want to. The question here is whether or not the government is going to force prices that are below that negotiated level.

So, the FCC said, "No. The cable company could be vertically integrated. It doesn't have to open up its infrastructure to rivals that provide retail service in the cable modems." And, it is interesting to see the reaction to that decision. The Washington Post writes "Cable's win is consumer's loss." OK. So, the cable operator has now the property right to control access to the system. A 6-3 opinion means that cable Internet providers won't have to face competition from smaller rivals that don't have the resource to build out their own networks. And, the Baby Bell phone giants, who are required to share their lines -- a very important point I'll talk about in a moment -- are already clamoring that yesterday's ruling means that they should get the same treatment. Well, that's just what we need, even less choice. OK. So, this is sort of a standard reaction certainly, that the lack of the mandate, the regulatory mandate means that you're not going to have this kind of inside-out competition, where the new rivals can get on the existing infrastructure, and compete at the retail level. OK. So, that's the journalist's take there.

This is the industry take, and it's a very interesting industry perspective because it comes from Intel and Nortel, two equipment suppliers who don't have any retail services for telecommunications -- "Brand X may boost some firm sales. Intel and..." I like the headline writers, by the way. "Brand X may boost some firm sales. Others see less impact." Thank you for that. There's a lot of information in that little phrase there. Intel and Nortel say, "Broadband spending may get a boost from Monday's Brand X Supreme Court ruling. Freeing that industry from common-carrier rules will be an indirect benefit to chip makers," Peter Pitch from Intel said. "People are going to want to buy computers with state-of-the-art microprocessors and that's why we're in this. We, largely, stand in the shoe of the consumer." Well, most of us have multiple shoes, but anyway...The interesting thing here is that I agree with Intel. They are, largely, in the shoes of the consumer. They want -- they don't have a dog in the fight, they -- between cable and telephone company providers or between ISPs, between EarthLink and Comcast.

But, they want lots of customers out there. They want more people to be using high-speed Internet connection because that creates demand for more computers, more computer chips, more home WiFi systems, which are a compliment to the Centrino WiFi chips that Intel sells, and so forth and so on. Nortel, also an infrastructure provider, they want phone companies, they want cable companies to buy their infrastructure. And, so, the interesting thing is they see this exactly the opposite of *The Washington Post*, OK, exactly the opposite. They think that by giving a property right to the investor, which in this case is a cable company, the owner of the infrastructure, by giving that property right to them and allowing them to negotiate whatever prices are appropriate for wholesale access to -- the competitors might want to use, that they're, in fact, rationalizing the investment incentives, and that this will drive deployment of the broadband technologies.

So, these are two views of the world. OK? The one view really thinks that competition is tied to these network-sharing mandates, that's what I call inside-out competition. And, the other says, "No. What we've got to do is we've got to have strong property rights for the owners of the capital, the networks, and let's, you know...let's pare back these network-sharing mandates and get more investment into head-to-head competition there."

So, economists have had a part in this, and they have kind of characterized the argument for the network-sharing mandates as the stepping stone theory. And, two economists out of Stanford put it this

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way. They looked at the FCC's resale program, which has been characterized as the so called UNE-P Program. Have you talked about what UNE-P means and --

Male Voice:	[unintelligible]
Tom Hazlett:	And, you know all the acronyms?
Female Voice:	That's what we teach here is that one.
Tom Hazlett:	Do you know [unintelligible]
Male Voice:	No. [unintelligible]
Tom Hazlett:	Oh, you don't know [unintelligible]
Male Voice:	We
Tom Hazlett:	You guys are falling behind in your [unintelligible]
Female Voice:	We are.
Male Voice:	We discussed it in a philosophical level, but we did not get to the economic level.
Tom Hazlett:	OK. So, they're talking about by the way, that is the FCC's leading
	output is acronyms, followed closely by agency reorganizations. But,
	these economists say two possible outcomes are likely to be good for
	consumers from the mandatory network sharing. One is that facilities-
	based competition emerges from the [uni-based?] entrants, the resellers,
	who are sort of the initial resellers. The second is that wireless services

make local-telephone access competitive. OK. So, in this case, wireless services would, basically, eliminate the monopoly all by itself, sort of unrelated to what's happening within the wired world.

But, this is the stepping stone theory right here -- a phrase that Nolan Rosten [cannot CQ this name] actually used elsewhere -- that you allow some firms to come into a market and share the existing operator's facilities and then build out. Why is it efficient, sometimes, to do it that way? Why do you want the entrance to have access, sort of you know...if they can rent the existing infrastructure, what are you trying to do there? What are you trying to, you know...what's the efficiency that you're actually creating for the entrant?

Male Voice: Just not to invest in -- don't make the initial investment in the wires.

Tom Hazlett: Yeah.

Male Voice: The cost of entry is...

Tom Hazlett: Well, this is actually the way it's put sometimes. That's not, actually, what you're trying to do because they're going -- you want them to make an investment. OK? And, it's often said, "Well, we don't, you know...we want them to get in without making the investment." Well, that's not really the argument because, when you think about that, well, why would we want them to get in without making an investment? There's -- if they can't raise the capital to come in and build a system, why do you want them to rent a system?

Male Voice: That's always been my problem because it seems like the people who've actually put the money in, in the front end, and then other people just come in and free ride on it.

Tom Hazlett:	Yeah.
Male Voice:	That's always been my problem.
Tom Hazlett:	Well, that may be a problem. I'm just saying, what's the argument? Forget you knowbefore we get to other issues, what's the rationale? Yeah.
Female Voice:	It would, ultimately, give them an incentive because what they would go in and do is create a customer base, and use that customer base to go and raise money in capital and say, "Look, I've got a customer base I can serve. I need to build a network and raise capital."
Tom Hazlett:	Yeah. That's a little closer to it. But, why I mean, you still want them to it has to do with this marketing aspect. So, you're getting, I think, close to what the to be honest, it's not a very well-formed argument probably. But, that, you knowthe basic idea is that, if you're the upstart entrant, competing with the incumbent, even if you have a good long-term business plan there, and you can raise the capital based upon the invested dollars and the expected return, when you get into that market, you have higher costs than a larger incumbent. Just take advertising, OK? You come into a market that has a million households and you start building, and after a year, you've built past 10% of the market. Well, to go on radio and television in that market, you've got to pay basically the same costs as somebody who serves a million households. It's very, very expensive to have that kind of an asymmetry, in essence, in your initial efforts.
	So, the idea is that you're giving some scale to the new entrant. OK. That's, basically, what it is. You knowyou can serve anybody in the

market if you can resell the existing incumbent's service. Now, I will say that in wireless and cellular, there was initially a lot of reselling in the 1980's in the old cellular duopoly. The Bell-affiliated wireless companies got in first. They got their licenses first and they generally built first. And, so, the second entrants, that were not affiliated with the Bell companies, did have the opportunity to resell service. And, so, before they got their networks up and running, they were able to sort of start marketing their services and get this customer base and so forth.

So, to sort of grease the skids, to get, you know...to get these entrants in, you have the stepping stone theory. But, as Nolan Rosten is quick to point out, you don't want this outcome. You don't want people to sort of get stuck in the resale program. The third possible outcome is that most local access competition will take the form of resale of the incumbent's facilities. In this case, consumers are not likely to benefit. Now, this has sort of gotten lost in the shuffle or did get lost in the shuffle for awhile there.

Why are consumers not likely to benefit? There's a very straight forward answer to this. If the network sharing mandates are what's putting these competitors into the market, you're not really getting market competition deciding all the important prices now because the important price now is the wholesale price that is offered to the entrants. That's set by the regulator, and that will then influence the level of capital investment, OK, because that's what the investors -- they get to sell now at this wholesale price determined by the government. So, the government is still regulating this. Now, if the government can magically, not magically, if the government can, you know...through all orderly deliberations here, set a price that actually does allow the entrants to come in, but does not discourage investment, they've hit quite a nice equilibrium. That's a very ambitious outcome here. And, the question that that would beg is, if the regulation can do such a good job of regulating, setting the right prices, why don't they just regulate the retail prices that well?

## Female Voice: Mm-hmm.

Because this whole idea of introducing competition is an admission that Tom Hazlett: the current and ongoing -- let me say that again -- the current and ongoing retail price structure, which is regulated, is not efficient.

> If the government was able to do a great job of regulating rates and setting them at just the right level that got them the optimal amount of investment, that didn't allow any market power at monopoly pricing, then you could already have a solution just through a monopoly. In fact, I mean, that's sort of the rationale of monopoly franchises and rate regulation, that, you know...the government can set the prices, right? And, the monopoly is the efficient solution. Just have one -- why have all that wasteful competition if the government can set the right price and eliminate monopoly profits? So, this is not where you want to end up. You don't want to end up with this kind of wholesale competition, or competition at the retail level from this wholesale price regulation scheme because that would be redundant if the price, you know...if you really trust that the price is set by the government.

> OK. Now, as we said here, we don't have to spend a lot of time -- maybe I spent too much time. But, this is the historical situation and it's important. But, we can look back already, in 2005, and talk about the collapse of the mandatory network-sharing regime because three times federal courts have overturned the rules. Once the United States Supreme Court in 1999 did it, then it went back to the D.C. Circuit Court of Appeals, those same rules in May of 2002. And, then, finally, in March 2004, the D.C. Circuit overturned the rules that were set by the Federal Communications Commission. And, what they -- I mean the rules, essentially, collapsed of their own weight. That is to say, that the political process was not up to

the task. It's a very complicated task. If you don't, you know...if you're skeptical, just get into this proceeding and start reading some of the, you know...the Ninth Report in Order and Reconsideration on, you know...the 13th Request for Reconsideration and so forth. But, it's a very complicated process to regulate these wholesale rates and, certainly, it's very complicated to regulate all this, you know...billions -- tens of billions of dollars -- of investment coming into the or not coming into the industry. And, through all this complexity, the FCC steered very markedly in two directions.

One, it wanted authority to set rates. It didn't want a lot of market negotiation taking place outside of the system. And, secondly, it wanted to set rates low. It wanted to set rates low so that they could point to lots of retail competition. And, this is what Alfred Khan colorfully calls "The Temptation of the Kleptocrats," which is a, certainly, a much more delightful way of putting the line from my paper that you quoted, this inevitable attraction of the political process towards redistributing rents, Khan calls it "The Temptation of the Kleptocrats."

That is to say, if investment is already sunk, why not go ahead and just write that capital down, and set very low prices for access? And, so, that, you know...that certainly has implications for investors thinking about future investments, but this is the problem we ran into. And, in fact, the D.C. Circuit, well, why did they throw this out? Well, they said that the rules were, in essence, overly generous to entrance-leasing facilities of incumbents and that itself undermined the expressed purpose of the '96 Act, which was to create competitive facilities.

So, this tension between inside-out and outside-in, actually was resolved by the courts. It came in from the outside, looked at this plan, and said, "Look, we're reading the '96 Telecommunications Act. It says we're all headed here in the direction of competitive networks. There is a sort of stepping stone theory that you're going to help squeeze that along a little, give it a boost, but your methods certainly are not designed to do that. They're designed to essentially maximize the opportunities for network sharing. They don't have any balancing tests. They don't examine the tradeoffs. They don't consider competition, for example, in the ability of cable operators to provide local loop facilities." I mean, you know...when you step back and look at it, you know...there are two wires to the home and there have been two wires to the home since 1996. One's owned by the cable company, and one's owned by the phone company, and the wires actually do have duplicative capabilities. They are substitutes.

Now, not all cable companies have used the wire for phone service and, certainly, not all of the phone wires have been use for video, which is sort of a separate problem that is right -- sitting next to us here. But, the courts looked at this and said, "Look, you're just not doing what the '96 Act told you to do, and that is to steer in the direction of getting competitive networks built, and having unregulated competition take over. You're headed on this path here that is nothing but maximized mandatory network sharing." And, there's no way, you know...I mean, once you get in to that, of course, you've got now, you know...and we had -- by last year, we had, you know...companies like AT&T with five million UNE-P customers, resale customers, that are totally dependent on the terms and conditions set by the government to use the underlying facilities.

And, so, that is not a very promising scenario for deregulation; particularly, as AT&T is saying through this period -- after by the way, selling its local facilities, i.e., its cable operations in 2002 to Comcast. It's saying, "There's no way we can afford to build network facilities at the local level, and the only way we can do it is by resale." So, now, it's very important also to understand that the stepping stone, the actual facts on the ground are just fascinating to look at.

In light of the stepping stone theory, these are FCC data on the number of competitive lines in the country and -- this doesn't come out very well. But, this is 20 million, the number of lines in millions. I don't know why it's so fuzzy here. Anyway...This is the 20-million line. And, by June of '04, we're up to about 21 million so-called competitive lines. There's somewhere around, I think, 150 million ILEC lines in the country at this time in 2004, to give you some concept of scale there. Now, so, this is the total right here. But, the breakdown is very, very interesting.

Now, the idea of the stepping stone is that companies -- new entrants come into the market and, at first, they engage in resale and then they build out networks over time. So, over time, the resale lines, you know...first get established, but then move over to what are called CLECowned lines, or competitor-owned lines. OK. The CLEC's being, you know...CLECs

Female Voice:	[unintelligible]
Tom Hazlett:	C-LECs oh, you call them CLECs? Oh, there's a harsh debate on that.
Female Voice:	I know. How do you even pronounce the acronyms?
Male Voice:	It's C-LEC in this class.
Female Voice:	He decided.
Tom Hazlett:	You better know that. OK. You better know it's not CLEC. OK. Sorry. It's like I have a bad, bad accent. That guy had a weird accent. He said,

"CLEC." So, here's the -- so, in light of the stepping stone theory, what happens? Well, what happens, let's go back to 1999, the end of the last millennium. That was a good millennium. Let's go back there. OK. Resold lines, meaning total-service resale, which is also in the -- I don't know if you've done this breakdown. But, there are two ways to resell a line. One is total-service resale, which was actually a part of the '96 Telecommunications Act, and it turned out that the methodology for setting the price gave suppliers, the new entrant, about a 20 percent discount from retail. So, if there was a \$25 retail-priced phone line somewhere, you'd get it for about \$20 if you were a competitor and wanted to provide that service against, you know...against the incumbent.

That program was set up early because it was actually -- the methodology was just to subtract some avoided costs from the retail price. It was, actually, a fairly simple methodology. And, so, there were, oh, maybe three million lines. I think that's five -- five, ten, fifteen, twenty --yeah. There's about three million lines were provided that way, nationwide, as of the end of 1999. UNE-P, which is in essence the same program, it's a resale where a competitor has the customer relationship, and then allows the actual service to be provided by the incumbent network paying the incumbent network a regulated wholesale price. Of course, UNE-P rates are from the ground up. It's just the -- basically, the incremental cost for providing each part of the service and putting it back together. Of course, you have this funny UNE-P. UNE-P is Unbundled Network Element Platform. Well, what is an unbundled network element? Well, it's part of the whole network service unbundled. And, the reason you want to unbundle them is because, again, if you're coming in and providing new services, sometimes you just want to buy, you know...one little thing, like a local loop or some transport or some billing services. You just want to buy one piece.

And, so, unbundling helps these entrants. So, that's been a classic competitive strategy in many regulatory programs. UNE-P is reassembling all the unbundled stuff. So, it's sort of this oxymoron of --UNE-P is, itself, an oxymoron. It's bundled -- unbundled elements. Anyway...So, when you -- but, when you do it on the back -- when you set the prices under that methodology, you came up with about a 50 percent discount and not a 20 percent discount from the retail price.

Now, that program was just getting set up here in late 1999, and you can see what happens. It sort of shoots up like a weed through this whole period. This is the UNE-P. If you combined that with the other form of resale, which is flat or just slight upward sloping through the whole period, this is the end of '99 through the mid-2004 data, then you have this top line. Excuse me. Sorry. This is not total competitive lines. This is total resale lines. I called that total competitive lines. I was wrong. Sorry. This is total resale lines right up here. So, you see resale is doing very well. But, it's doing well really because UNE-P is going from, essentially, zero to ten million -- over ten million and just dominating this category now of competitive lines. Now, CLEC-owned lines total, that's about two and a half million here. It jumps up in 2000 to five million, and then it goes up but slowly. It goes up, but slowly. So, you're only at about seven and a half million.

Female Voice: What do you mean, a C-LEC-owned line? You mean, like, they actually built a line?

Tom Hazlett: Facilities-based lines.

Female Voice: Mm-hmm.

Tom Hazlett:	OK. Facilities-based lines. So, they're not leasing. They're not leasing
	these lines.
Female Voice:	Pardon me?
Tom Hazlett:	Yeah?
Female Voice:	Is that CLEC on the total C-LEC on this total line on the chart kind of a
	graphical representation of the fact that there wasn't much more
	infrastructure being built because of the DSLAMs?
Tom Hazlett:	Well, it's two things. Let me just show you one other thing here to help
	answer that. Let's look at just the cable component of the CLEC-owned
	lines because cable operators are a big part of that mix. And, they just
	started being kept by the FCC in December 2000. OK. Now, this is
	actually a nice upward slope until the end of 2002. Then it goes it just
	deadlines. For the next year and a half, you knowit just flat lines there.
	If you take out the cable-owned lines from the CLEC-owned lines so,
	you just now, it's facilities-based competition not counting cable. Look
	what happens. Between the end of 2000 this is right here the end of
	2000 and mid- 2004, it actually declines. It is actually going down. OK?
	Now, as UNE-P grows, as resale grows, you should see those lines
	converted on the stepping stone theory, and you should see a spurt in
	competitive-based entry. No, uh-uh. It goes the other way. This is OK.
	This is a no-brainer even for the FCC. OK, this is not subtle. This is, you
	knowthis is what's happening in the marketplace if you look at all the
	financial analysts. They're all saying the same thing. Well, this is exactly
	the statistical backup for that.

The competitive-based lines with new facilities are not responding positively to this influx coming from UNE-P. Now, sure, you can have some complex theory about it takes seven years to do this. And, if you had exactly seven years, then boom, the whole world would change. But, there's no plausible theory to explain this consistent with a stepping stone. So, this is nice and, in fact, it gets even better because what happens in 2004 is we get this collapse of the network-sharing regime.

Some of us are very curious about cable telephony, very curious about cable telephony. As I said, since 1996, every home in America has had two wires, two telecommunications wires. And, the interesting question, or one interesting question, you could ask is "Why hasn't the cable operator come into the market with voice service?" They've certainly come into the market with broadband service. In fact, they've spent tens of billions of dollars to upgrade their systems to two-way digital so they can do digital services including cable modem, high-speed data.

Cable telephony is -- I call it the dog that didn't bark, meaning there was no response. Well, not no response -- there was some response to the opportunity to provide cable telephone service, voice service. But, there's this -- oh, my theory, which I don't think is a stretch here, is that there was this overhang. If you're a cable operator, certainly, you're looking at the returns from spending some hundreds of dollars per phone subscriber to provide phone service. Now, Cox Cable, fortunately, has been aggressive on this and they provided white paper after white paper actually giving us the numbers. They've been saying for some years cable telephony is fine. The water's great, come on in, everybody. And, so, they claimed, that even before VoIP was economically competitive, they claim that you could get a cable voice subscriber for \$600 of investment, incremental investment by the cable operator. And, they've been doing this. And, Cox has over a million phone customers today. But, the other companies don't believe them. The other companies wouldn't -- in fact, AT&T, TCI did do some of this. As soon as Comcast bought them in 2002, boom, they cut that down essentially to nothing. And, the rest of the industry, the same. Well, why not? Why has there been this reluctance?

Well, interestingly enough, you can see part of this pattern right here. There was some upward trend here in cable telephone subscribers. This is December 2000 again. It started with about a million. These were different data from the FCC, I believe. And, you go to the end of 2002 -and remember, right through this period now, UNE-P rates are falling. They are falling state by state by state. The regulators are actually lowering those prices. And, it's just undercutting the incentive for the cable operators to come into the market. You say, "Well, cable's not regulated." That's exactly right.

Cable is not directly regulated, but they are directly competitive. And, so, the overhang from having resellers come into the market, and being able to access these facilities at theses big discounts, 50 percent and more -- AT&T said it would never enter a state, provide the resale service, unless it had at least a 45 percent discount from retail. Of course, some of the states had a lot more than that. One of the analysts said the average discount was about 53.5 percent.

Anyway, so, if you're the competitor out there, why invest [unintelligible] even if it is only \$600 per phone subscriber? Why should you put that at risk when the regulators can lower those prices in the competitive medium, and take local phone service down to, you know...\$15, \$20 a month, which is where, you know...where it was going through just the resale program? OK. So, what happens is, despite the idea the cable --

now, this is the total amount of cable subscriptions -- OK -- gets up over three million by the time we get to the middle of June '04. But, this is the incremental for each period, the cable telephone additions. And, you can see that it just falls to zero during this period when UNE-P rates were coming down and the big UNE-P build up was going on. You saw the chart before, exactly when there was this new flood. It was MCI- and AT&T-led. Certainly, those were the big resellers. That's when the cable companies just backed way off.

So, this doesn't have anything to do with Bell Companies. It's not access to the Bell Company network. It's not, you know...it's not the incumbent monopolies. These guys -- they're not even incumbents in the phone business. This is just a rational investor reaction by the competing network not to invest in voice services as the resale program was out there. So, not only was there was not a stepping stone, but the companies that should have been in there [shwwt] like that, they're backing off from this whole program. And, so, many people -- this is just one of the many analysts -- take a look at that. We believe UNE-P's demise -- this is, finally, in March 2004 -- could accelerate broadband deployment.

With the potential elimination of UNE-P resale, we believe the spread of broadband [unintelligible] some of these companies would not be as concerned with the loss of telephony subscribers to such companies that do not have to invest in any infrastructure. Simply put, where UNE-P is successful, cable telephony has not been. OK. So, that's exactly what the logic is there.

Now, the flip side of that test, why you get very few new additions to cable telephone service in 2003, 2004 is the year that those rules fall apart and the market starts to adjust to a new regime. Immediately, you get a reaction. You get a reaction that now the phone companies are much more

aggressive. Now, of course, VoIP, Voice over Internet, is now the flavor of the month for the cable companies, and they're using VoIP rather aggressively for voice service.

So, there is an alternative argument, "Well this is just technology driven." VoIP wasn't there. It's there now. It has nothing to do with regulation. You could make that argument. Some people have. I'm completely unpersuaded by the argument. VoIP has been 18 months away since 1996. OK? And, the fact is that the alternative VoIP was circuit-switch telephony. Cox was doing this for a number of years and they claim that their penetration rate after four years was about 40 percent. They were doing fine with it. It was profitable.

I happen to believe that the financial risk involved with the UNE-P overhang had a lot to do with this and then, in fact, the aggressive rollout -- and you can see that the cost of VoIP now are \$100, maybe \$150, less per subscriber for capital investment for the cable companies. The cable companies, you know...had this sort of gold standard of VoIP. It has independent electricity, so it works in a power outage, and it's got high-quality voice service.

So, they'll probably invest something like \$400, \$450 a subscriber in infrastructure for VoIP, which is less than \$600 a subscriber, which is the cost of circuit switch. But, the cross drop, while, you know...somewhat important certainly, is not the real determining factor here. The real determining driver of this, in my opinion, is the regulatory switch. And, you're getting, of course, a big kick up now in cable telephony subscribers. Yeah. You had a question?

Female Voice: Yeah, I just -- I mean, you're talking about the lack of impact currently in the way of VoIP, but what if all the people that are wireless only now --

they don't even care about -- I mean, I haven't had a landline for years and I know I'm not alone. What sort of impact has that had on this battle over...?

Tom Hazlett:Well, certainly, it's not going to help. But, notice that VoIP and cable<br/>telephony -- I mean a lot of cable telephony is VoIP now, not all of it.<br/>But, anyway, that's going to kick up. That is kicking up, even when<br/>wireless is a more effective competitor. So, yeah, wireless rates coming<br/>down is going to hurt all of its competitors as substitution takes place to<br/>wireless. But, this, you know ... this is interesting just -- that just makes<br/>the case stronger that regulatory disincentives were keeping cable<br/>telephony out of the market.

Now, this is just the homes passed. There were only about 16 million homes passed by cable telephone service. That's, you know...about 15 percent -- about 110 million U.S. homes. That was 2003. Now, they're putting in the infrastructure, the cable operators, to provide the service basically everywhere. So, in one year it doubles. And, we'll be pretty full out, I think, by the end of 2005, i.e., over 90 million households will be able to get cable telephone service.

Now, there's another experiment that is going on here that I think is great. And, it has to do with this Brand X case a little bit. So, we talked about it somewhat. In broadband, by which I mean residential broadband, this DSL-versus-cable modem race -- not that I rule out wireless or satellite or anything else but, this is what it has come down to. We have head-to-head competition between two rival regulatory regimes. Now, if you're up on your *Communications Daily*, you know that in the last month there's been a little bit of change in that regime. But, our historical experience here is quite nice and provides us a very nice, natural experiment between a closed platform, which is what governs cable broadband and a so-called open platform. The cable operator has vertical integration -- we talked about that. No mandatory third-party access to use those lines at regulated rates.

DSL, Digital Subscriber Line service, provided by telephone companies, these telephone companies have to allow other operators to use those facilities. They have to be able use the local loops and co-locate their switches, their data switches, in the central offices of the phone companies. And, these are offerings that are made at regulated rates. That's why I can get EarthLink DSL service at my house, but I can't get EarthLink cable modem service at my house. OK.

Now, we've had that competition between the closed and the open platform for some time, but the terms switched. They switched against openness, what we're calling openness here. They switched against openness in February of 2003. That was an FCC decision called Line Sharing. Line Sharing was a rule that allowed these ISPs or D-CLECs, the data -- so, you call them C-LECs. You know...that's a problem for your interpretation of what I call the CLEC term because I can say, "D-CLEC," but you've got to say, "DC LEC."

Male Voice: And, I say CLEC, CLEC to that.

Tom Hazlett: So, the one DCLEC that's left, data CLEC is Covad -- one well-known one. There's smaller ones. But, companies like Covad were able, in many states, to get access to the local loop sharing a voice connection and just using the rest of the frequency in that connection, that loop, that wasn't being used by the voice connection. And, the marginal cost of that is essentially zero and some regulators were saying "OK, you can get it for essentially zero." And the FCC ended that OK? And, they ended it on February 20, 2003. That, effectively, raises the cost of accessing the open platform if you're an outside rival and you want to be a new entrant. So, *The New York Times* ran the headline the following day "High Speed Service May Cost More." And, predicted flat-out that this would limit competition, the same as *The Washington Post* reaction -- not that all our newspapers write the same story over and over again.

OK. So, we can test this. What we can do is we can just see which platform is more successful in the eyes of the marketplace. Consumer acceptance -- you can say, "Well, it's not just consumers. It's how much build out, how much investment there is." Yeah, I like that. I like that. I want that in the test. OK. So, I'm just going -- it's a very simple test. It's somewhat crude, but I think it's really powerful. Let's just look at which network does best to provide residential broadband service. OK?

This goes back to first quarter of 1999. Again, I apologize for the graphics here, but this is the fourth quarter of '04. The lavender line, or whatever this color is, is cable modem subscribers. By the end of the data, you come up with over 20 million households subscribing to cable modems. The blue line on the bottom is DSL subscribers. You start at about zero in the first quarter in '99, and you get up to about 14 million here.

Now, here's a line, a vertical line, for the FCC Line Sharing decision, first quarter '03. You'll notice, during the pre-Line Sharing period, there's almost a 2-to-1 advantage for cable and it just keeps going. It's very steady. After that decision, cable modem, you know...you don't have to be an Excel spreadsheet to figure out that trend line. It's just nice and linear. It just keeps going.

Interestingly, DSL -- OK. DSL does not tail down. That's *The New York Times* prediction because when they say, "Your DSL may cost more," they mean it's obviously going to be less preferred by customers relative to cable modem service. Uh-uh. The cable modem shows the same trend. DSL kicks up. Here's the dotted trend line just based on an extrapolation of this period right here.

You actually get a very substantial increase of maybe about 30 percent by the time you get to the fourth quarter of '04 and that's not many quarters. One, two, three, four, five, six, seven...so, very quickly -- yeah -- time --OK. Well, very quickly, you find that cable modem service starts losing relative to where it was. This is the ratio of cable modems to DSL. And, you'll notice right at the Line Sharing opinion, cable modem has the biggest advantage. Boom, it goes down. And, then, if you look at new additions -- this is new adds per quarter. DSL, again, on the bottom here, up until the Line Sharing decision. Now, new adds per quarter is kicking right up to the same level as cable modems, not because cable modems have down, but because DSL has come.

So, here, it's a horse race, meaning that DSL and cable are now neck and neck. DSL is now running at par with cable, and we expect the 50-50 spilt to continue. So, you actually have an experiment, an actual experiment, you lowered the open access requirements on DSL. There's more intense investment. Prices have clearly come down. The prediction of *The New York Times* is flat out wrong on both the quantity and the price ends of things. The price has gone down for DSL. DSL price cuts are now certainly leading cable modem price cuts. Cable modems are responding by increasing speed, certainly, and that's a good thing too. I mean, you know...you want that competition back and forth certainly.

You can get, on the investment community, a very nice concurrence on this. This is a very interesting thing from Gardener [not CQ] a year ago, where Gardener was trying to forecast fiber. Now, fiber we haven't talked about. But, of course, fiber to the home is the, you know...a lot of buzz about the huge capacity that you can get if you actually get telecommunications companies to build fiber to the customers. And, here was the purple line, or the lavender line here, is the prediction of how much fiber there would be -- this is fiber sales -- how much fiber there would be in the U.S. market prior to the FCC ruling in 2004 that they would forego any access mandates. And, they immediately -- as soon as they get that ruling, they immediately push the curve out saying there's going to be more fiber invested. Just boom, as soon as you get less, you know...less openness by mandatory network sharing, you are going to get more investments.

So, at the end of the day, we're saying that the way to get the competitive networks is to encourage competitive networks, that the stepping stone theory, this sort of this midway way station has proved very complex. It's proved, ultimately, unworkable just in a legal sense. And, that's why the rules collapsed in court. And, it's proved problematic in the political rentseeking sense. You've got so much controversy and so much rent-seeking going on that the government has not been very good about crafting efficient rules.

And, at the end of the day we get this lucky break that, in fact, the marketplace has moved. The marketplace has moved to this fairly competitive environment where, if you just look around today at the typical household telecommunications, residential telecommunications consumer, you've got those two wires to the house that now are increasingly going to the triple-play voice, video and high-speed data cable versus telephone.

You, certainly, have those satellites over there delivering video. That is part of the mix. And, you have the wireless industry. Now, the last thing that I will leave with you, the wireless industry was six carriers. It's consolidated to four, and that consolidation is somewhat problematic. I mean, this is just a little of the fixed-to-mobile substitution. And, I picked out Finland, where they actually now are down to about 60 percent phone penetration for fixed lines. Now, we haven't seen that drop in other countries, like the United States for example. But, Finland was over 90 percent at or above where the U.S. was in 1990. Fixed-line penetration -they're now at 60 percent just because there's a just -- wholesale abandonment.

Female Voice: You're going to need to come back and talk about spectrum.

Tom Hazlett: We're talking about spectrum. OK. Well, I'm just going to say that, in the wake of these mergers, you've had Cingular now upgrade for broadband, its broadband network. T-Mobile has not gotten a partner. It doesn't have the spectrum. And, in fact, T-Mobile, despite all of its data customers, is not upgrading and will not for some years upgrade. They've made that call now that they are waiting for spectrum.

So, at the end of the day, the network-sharing mandates are gone. Cable open access, of course, has been ruled out by the Brand X decision. Now, there's been a DSL decision that opens the -- in essence, goes the same way for the phone system. And, so, that is essentially bundled -- the cable modem and DSL deregulation. VoIP certainly is an important part of the, you know...the mix here. But, regulation, un-regulation -- the key issue there. Tom Hazlett 09-21-05 Law 614 GMU CTW Seminar Page 29 of 30

We can talk about universal service some other time and then, of course, spectrum -- more spectrum in the market for these carriers utilize to compete -- very, very important and one of the real problems in the American system because we've under-allocated spectrum for these operators relative to other countries and relative to what could be efficiently allocated in the U.S.

So, that's more than enough. Thank you.

## [applause]

Male Voice:	A decidedly un-philosophical and [unintelligible] discussion. But, I think
	it was great because it shows that there is a real world out there behind
	some of these things that we're talking about. Tom, we do have some
	people doing term papers on some of these topics you've touched on, and
	I'm sure you would be happy to talk to them
Male Voice:	Yeah.
Male Voice:	as they go through their term papers.
Male Voice:	And, Dale Hatfield is coming and will be talking, principally, about spectrum. So, we might think
Tom Hazlett:	Oh. [unintelligible]
Male Voice:	we might think of a double header, if we could, and ask you to come back and talk a bit about spectrum with Dale.
Tom Hazlett:	OK.

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Male Voice: Thanks again.

Tom Hazlett: Sure.

Female Voice: What it shows is the effect of these regulatory decisions on investment.

Tom Hazlett: Yeah. Well, yeah, there's more in that paper that has the very dramatic downturn in telecommunications investment in [unintelligible] And, of course, you have the, you know...the phone...

End of recording.