Coordinated Effects Analysis: The *Arch Coal* Decision

An ABA Section of Antitrust Law Brown Bag Program (October 27, 2004)

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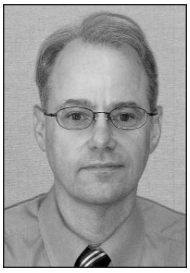

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Editor's Note: *In August 2004, the U.S. District Court denied the FTC's request for a preliminary injunction to prevent Arch Coal from acquiring the Triton Coal Company, in* FTC v. Arch Coal, Inc.*, 329 F. Supp. 2d 109 (D.D.C. 2004),* appeal dismissed per curiam*, No. 04-5291, 2004 WL 2066879 (D.C. Cir. Sept. 15, 2004). The court's opinion raises a slew of questions about the way in which the enforcement agencies (and outside parties) analyze mergers. Some of these questions relate to market definition and market share measurement in exhaustible resource industries. But other questions relate to the agencies' reliance on using a coordinated effects analysis to challenge a merger. The court opinion clearly found that the FTC's coordinated effects case in* Arch Coal *missed the mark for injunctive relief. What (if anything) does this decision imply about future agency reliance on a coordinated effects theory or for the construction of such a theory? Still other questions pertain to the agencies' traditional reliance on customer testimony as credible evidence supporting an agency claim of anticompetitive effects. The court dismissed such customer testimony in* Arch Coal*, raising issues about how this type of evidence might be used in the future.*

In October 2004, the ABA Section of Antitrust Law Fuel and Energy, Economics, and Mergers and Acquisitions Committees jointly sponsored a brown bag program on the implications of the Arch Coal *decision for antitrust enforcement—for market definition and for a theory of anticompetitive effects. Three distinguished and well-known economists were invited to opine on those implications. The insights offered by the three panelists are both thoughtful and provocative.*

—*John Woodbury*

JOLA STERBENZ: We've invited our distinguished economists to share their views on the recent district court decision in *FTC v. Arch Coal* declining the FTC's request for a preliminary injunction against Arch's acquisition of Triton Coal's mining assets in the Southern Powder River Basin (SPRB). The decision was a significant blow to the FTC's merger enforcement efforts, especially in cases where the agency pursues a theory of coordinated interaction, which it relied on in this case.

The SPRB, which is situated in southern Wyoming, is a prolific area of high-quality, environmentally friendly coal, which has been increasingly used by US coal-fired generators. This is a relatively concentrated region. At the time of the merger proposal, Arch and Triton were the third and fifth largest producers of SPRB coal, in addition to Peabody, RAG, and Kennecott. The FTC argued that the merger would facilitate coordination on output decisions among the remaining coal producers. More specifically, the FTC posited that, after the merger, the major SPRB producers would be able to keep their production levels lagging slightly behind expected customer demand, which would create upward pressure on prices. The district court declined to issue the injunction, concluding that the agency failed to show the likelihood of such output coordination.

Before I turn the discussion over to our panelists, let me describe the major issues raised by the court's determination. I propose to use this list as a springboard for our discussion. One of those issues is the viability of the production-lagging-demand theory of output restriction that the FTC pursued in this case. The court's order implied that there is something novel about this theory. But is that correct? Does each and every output restriction case depend on evidence of an actual reduction in output?

. . . the court essentially disregarded their testimony, concluding that, at the end of the day, the customers had no way of knowing whether this particular merger would increase prices.

—Jola Sterbenz

Relatedly, the court seemed to imply that there was something novel about this coordinated output restriction theory in a sense that the agency didn't offer any evidence of pricing coordination in addition to the evidence of the alleged output restriction. But is such pricing coordination evidence even necessary, given that an output restriction will likely be followed by a price increase?

An even more interesting question is raised by the part of the decision devoted to the kind of evidence that the government would have to present to support a tacit coordination case. In this case, the FTC relied on what I will call historical evidence, as well as "documentary" evidence. The historical evidence consisted primarily of a 2000 SPRB coal price spike, which was preceded by public announcements by the major SPRB producers regarding the need to increase SPRB coal prices, either through output reduction or mine closings. The agency corroborated this evidence with internal company documents that apparently indicated that the industry was ripe for collusion. But the court was not too persuaded by this evidence. First, it concluded that the prior output reductions and mine closings could be explained by legitimate business reasons. It also pointed to possible independent reasons for the price spike, such as bad weather or low utility stockpiles. Ultimately, what the court found to be fatal to the agency's case was the fact that the FTC did not offer evidence of how this alleged output coordination could be done. In the court's view, the agency merely demonstrated that the producers were eager and willing to collude. However, it did not show how this collusion could actually work and how deviations from the common scheme could be detected and punished. The issue for us today is, thus, what were the shortcomings of the FTC's evidentiary case, if any?

Then there is the issue of the weight that should be given by a court or the antitrust enforcers to customer complaints. The FTC relied on heavy customer opposition to the Arch/Triton merger. The complaining customers were large sophisticated electric power generators (both utility and nonutility). Some of them testified before the court, and some presented economic studies in support of their agency affidavits. Nonetheless, the court essentially disregarded their testimony, concluding that, at the end of the day, the customers had no way of knowing whether this particular merger would increase prices. Given traditional reliance by the FTC and the DOJ on strong customer opposition in merger cases, that brings into question the continued viability of such reliance on customer testimony—that is, of course, unless a customer is able to present evidence demonstrating that, in fact, a given market will not behave competitively after the merger. The related question is whether a customer would ever be able, or willing, to put forth this kind of evidence.

And finally, there is the issue of the proper measure of market shares in the natural resources industry. In this case, the FTC measured market shares based on actual productive capacity of the mines as well as loadout capacity. The court, however, agreed with Arch that a better measure was to rely on future reserves that are controlled by the producers, which had the effect of slightly lowering relevant market shares. The issue for us to explore is which approach is better and why.

ELIZABETH BAILEY: The way we're going to proceed is first, we'll hear from each of our presenters. Then, before we open it up to questions, we'll give the presenters an opportunity to respond to each other. Then we'll open it up to questions. Andrew?

ANDREW DICK: I will discuss several issues raised by the *Arch Coal* decision, and I will try to place my remarks into the broader perspective of the FTC's and DOJ's renewed interest in coordinated effects merger analysis.

Following the adoption of the 1992 Horizontal Merger Guidelines, coordinated effects analysis languished as an active instrument of merger review and enforcement. Over the last decade, mergers were much more likely to be reviewed (or challenged) on the basis of unilateral effects concerns. More often than not, when a merger complaint included a coordinated effects allegation, it had the flavor, if not the reality, of being an afterthought. When coordinated effects theories were advanced in merger challenges, the agencies usually built their case in fairly simple terms, on three legs: a structural presumption, the checklist of market factors associated with Richard Posner and George Stigler, and evidence about premerger conduct, such as a history of attempted collusion or facilitating practices. Both the theoretical underpinnings and the empirical foundations of this three-legged approach have received substantial criticism of late from antitrust practitioners and industrial organization economists.

Under recent leadership—Tim Muris at the FTC and Hew Pate and Charles James at the DOJ—the agencies have sought to reinvigorate coordinated effects merger analysis by bolstering its theoretical foundations and applying new approaches to analyzing evidence. Agency officials have spoken publicly about their renewed interest in pursuing coordinated effects theories, and these officials have outlined some of the new thinking that is being applied by agency staffs. In summer 2003, the DOJ successfully blocked UPM-Kymmene Oyj's proposed acquisition of Bemis MACtac using a coordinated effects theory. Several speeches by DOJ officials explained the agency's thinking behind that merger challenge. And while it ultimately cleared the Carnival/Princess and Royal Caribbean/Princess transactions in late 2002, the FTC issued a lengthy closing statement articulating some of its new thinking on coordinated effects analysis and empirical methods.

While acknowledging the lingering influence of the three-legged approach that I just mentioned—the structural presumption, the checklist, and premerger conduct—the agencies' approach now places greater emphasis on articulating and empirically demonstrating the specific mechanisms by which a particular merger would make coordination easier to arrange or sustain. While some commentators have described this approach as "new," in fact, it simply harkens back to the Guidelines' recognition that successful coordination requires reaching an agreement, monitoring compliance, and (when necessary) punishing deviations. What makes the current approach "new" is that the agencies have acknowledged the need to articulate and demonstrate the mechanisms by which they believe a merger would facilitate reaching and enforcing an anticompetitive agreement.

In its challenge to the Arch Coal merger, however, the FTC largely reverted to the traditional three-legged approach. The court rejected the FTC's arguments and evidence on each of the three legs as being either inadequate or inconclusive. In light of this, and given the FTC's failure to clearly articulate and convincingly demonstrate the mechanisms by which the merger would have made coordination easier, the court was left with no basis on which to block the merger. The clearest indication of the shortcomings associated with the FTC's approach lies in the court's statement that the FTC's theory was "novel." The FTC's case theory was underdeveloped analytically and was supported insufficiently by the evidence offered to the court, but it did *not* present novel economics.

I will start by describing the three legs of argument and evidence that the FTC advanced, and I will then discuss why the court effectively rejected each leg. Next, I will draw some broader lessons about coordinated effects cases from each of these discussions.

. . . when the structural presumption is at best weak, the agency must identify the mechanism by which a seemingly small change in market structure could make coordination easier to reach or sustain.

—Andrew Dick

The first leg of the FTC's challenge was its attempt to establish a structural presumption. The FTC alleged that the merger would combine two of the four leading producers in what the agency asserted was the relevant market, would substantially increase concentration, and would result in a highly concentrated market. I believe that Michael Salinger and Greg Werden will discuss in more detail the dispute between the litigants over market definition and measurement, and so I will not dwell on that issue. While the issue was important, it was not decisive to the outcome of the case. In the defendants' preferred market, the delta would have been just 49 points. Even under the FTC's preferred market definition, the delta would have been only 224 points. The court believed that both of these changes in concentration fell well below levels typically associated with merger challenges. The court also noted that because the transaction involved a partial divestiture to a third party not currently in the market, the merger would not actually reduce the number of competitors. The need to litigate the divestiture "fix" further weakened the FTC's ability to develop a strong structural presumption.

In the end, the court held that the FTC had barely satisfied its prima facie case burden, and it concluded that the structural case was "not strong." Based on this, the court lowered the bar for the defendants to rebut the FTC's prima facie case. The lesson that I take away from the court's view of the FTC's first argument is that when the structural presumption is at best weak, the agency must identify the mechanism by which a seemingly small change in market structure could make coordination easier to reach or sustain.

The second leg of the FTC's challenge relied on the familiar Stigler-Posner checklist of factors thought to be conducive to coordination. The FTC's complaint cited several checklist factors when characterizing the premerger market, including: a small number of competitors, barriers to entry, product homogeneity, inelastic demand, close geographic proximity, and substantial competitor information. The court disputed the FTC's claims about several of these characteristics, believing that the factors either were not present or that the evidence was inconclusive. Facing what it regarded as ambiguity in the factual record, the court lacked any basis on which to balance the plus and minus factors on the FTC's checklist. The agency's silence on the balancing issue highlights one of the primary weaknesses of the checklist approach, which is that there is no rigorous method to weigh the various factors when they come into conflict. Equally important, the FTC did not explain whether or how the merger would have *changed* any of the checklist factors. Specifically, the agency did not articulate how the merger would have given rise to a market whose characteristics were more conducive to coordinated interaction. As a result, the FTC failed to establish the second leg of its merger challenge.

The lesson that I take away from the court's view of the FTC's second argument, therefore, is that reliance on the checklist remains both problematic and insufficient as a basis for merger chal-

lenges. The checklist is problematic because if the evidence is mixed across various factors—as it often is in the real world—then we are left without an objective basis to weigh conflicting evidence. Moreover, the checklist is insufficient because, standing alone, it is silent as to the mechanisms by which a merger would change any of the checklist factors in such a way as to make coordination more likely post-merger.

The third leg upon which the FTC based its challenge was evidence about premerger conduct. The FTC alleged that major coal producers frequently and publicly communicated their pricing and production intentions to each other. The FTC asserted that these public announcements amounted to signaling between competitors that could facilitate coordination. The court rejected the FTC's interpretation, however, for two reasons. First, the government's expert witness offered no opinion as to the state of pre-merger competition, which undercut the FTC's allegation that firms already had been attempting to coordinate. Second, while the court described some of the public statements by company executives as "indicative of possible producer coordination to limit production" and cautioned that these statements "warrant close scrutiny," the court ultimately concluded that there were independent, legitimate business reasons supported by credible evidence to explain the premerger conduct. The court also went on to note that the FTC had not shown that competitors had responded to or acted upon Arch's public pronouncements about cutting production.

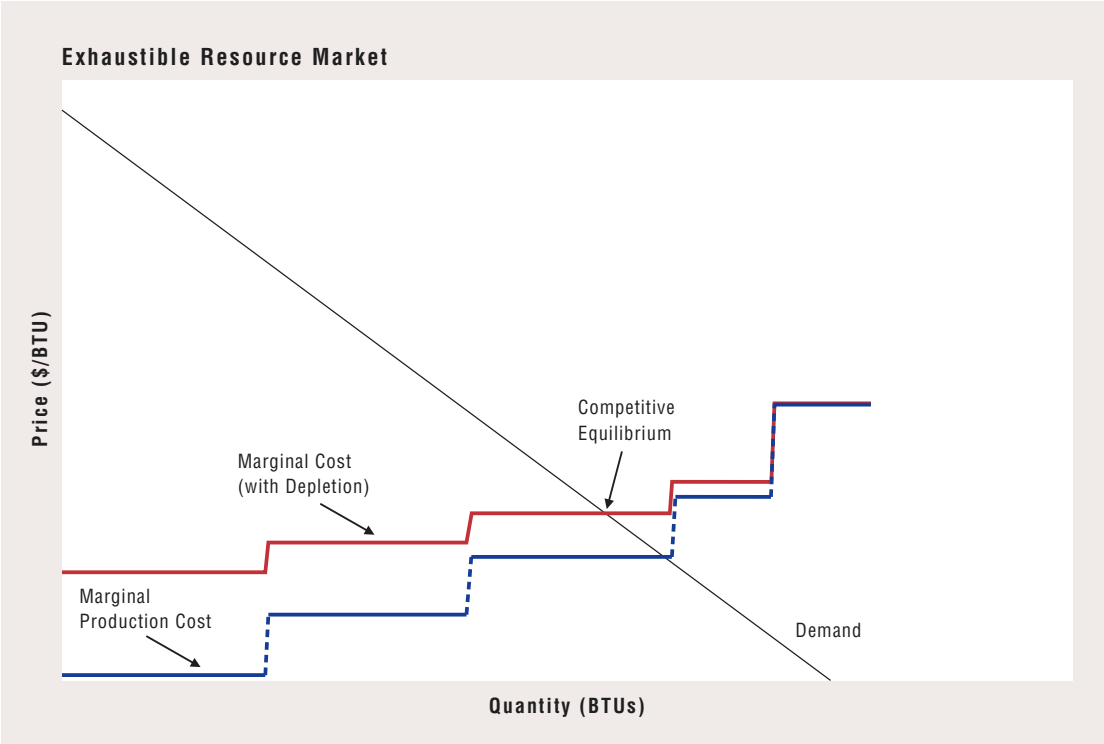
The FTC's failure to draw a tight link between competitor communications and pre-merger competition removed the third and final leg of its merger challenge. The lesson that I take away from this is that the agency must provide the court with a basis to reject alternative and competitively innocuous explanations for conduct that the government seeks to characterize as anticompetitive. Related to this, to the extent that it seeks to characterize premerger conduct as evidence of attempted but unsuccessful coordination, the agency needs to identify the mechanism by which the bad conduct would be more likely to prevail post-merger.

Having failed to be persuaded by the FTC's traditional lines of argument, the court found itself without a basis to block the merger. The court clearly was searching for an explanation from the FTC about how the merger would facilitate reaching and enforcing an agreement. The court voiced its confusion, or frustration, by describing the FTC's proposed theory of output restriction as "novel." The FTC's theory was predicated on an output restriction in which the major coal producers would limit extraction so that increases in supply would lag behind increases in demand, thus creating upward pressure on price. As I mentioned earlier, the theory does not present novel economics. I think the court's difficulty in embracing the theory, however, stemmed from the FTC's failure to clearly articulate and persuasively demonstrate the mechanisms by which the merger would have facilitated the coordinated output restriction.

In summary, the FTC's approach in *Arch Coal* shifted the agency back towards its traditional approach of alleging a coordinated effects case: the structural presumption, the checklist factors, and the emphasis on developing evidence of pre-merger conduct. The court indicated its willingness to consider the FTC's approach and the evidence that it mustered on each of the three legs. But having found factual weaknesses or ambiguities on each leg, and without the benefit of the FTC offering and supporting a clear statement of the mechanisms by which coordination would have been facilitated, the court was left without a basis on which to assess whether coordination would in fact become more likely post-merger.

MICHAEL SALINGER: Andrew did an excellent job of summarizing the case so I'm going to focus my comments on a small number of the economic issues that were particularly knotty. First, in an exhaustible resources market, how should we measure market share? Should it be output or

reserves or something else? Second, how should we deal with variations in the quality of the resource, in this case coal? And then third, what beyond the structural evidence should we consider in a coordinated effects analysis? I will use a simple supply and demand analysis as it relates to exhaustible resources to answer these questions.



Here's my supply and demand graph. Let me start with a technical detail. Notice that on the horizontal axis, quantity is measured in BTUs (rather than tons) and price on the vertical axis is measured in dollars per BTU (rather than dollars per ton). That choice reflects the assumption that even though utilities literally buy tons of coal, what they care about are the BTUs. If so, they compare bids at least to a first approximation on a price per BTU basis. This point about how quantity should be measured is important because the measure of quantity determines how price is defined, which in turn determines which suppliers are low cost suppliers and which are high cost.

The implication of this being an exhaustible resource is shown in the cost curves. With an exhaustible natural resource, you should expect that there will be variation—indeed, perhaps substantial variation—in production cost. That's the lower of the upward-sloping schedules on the slide, labeled Marginal Production Cost. I've put steps into these schedules to suggest that we have different mines that have different costs associated with them. In an exhaustible resources market, the production cost is not the only cost that you need to worry about. There is also an opportunity cost (or scarcity rent) to the coal, and that cost is inversely related to the production costs. The difference between the production cost and the marginal cost including the depletion, which is the higher of the two lines, is bigger for the low production cost firms. But the effect of the depletion cost doesn't completely offset the low production cost. The low-production cost firms are also the low total marginal cost firms.

In a competitive market, the marginal cost curve is the supply curve; and the equilibrium in a competitive market is the intersection between the supply curve and the demand curve. Now I need to make two more points about natural or exhaustible resource markets to answer the ques-

tions that I've set out to answer. First, monopoly power cannot lead to permanently higher prices. The difference between monopoly in an exhaustible resource industry and competition is that with monopoly, you have higher prices today and for some period. But then, as a consequence, the resource gets used more slowly and more of it is available in the future. Prices in the future are then going to be lower than they otherwise would be. The importance for antitrust analysis is that if we are going to be concerned with price increases in these kinds of industries, those have to be price increases in the short and intermediate run. We can't be concerned with price increases into the indefinite future.

The second point is that the low cost producers on this slide would like the price to be higher. What stops it from being higher? It is the producers in the middle—in this case, the producer represented by the third highest step is the marginal supplier, and that supplier's cost determines the current price. The next supplier on the supply curve also limits how large a price increase would be feasible if the marginal supplier were to allow the price to go up, but not all suppliers or all potential suppliers are constraining the current price and can be expected to constrain the price in the intermediate run. The very high cost suppliers (e.g., those on the highest step) might become a force in the market at some point in the future, but they aren't now.

The problem with reserves is that they include high cost reserves. And, if so, they do not constrain the price within the timeframe that is relevant for antitrust analysis.

—Michael Salinger

With these analytic preliminaries out of the way, I can answer the question that I set out to answer. First, "How do you measure market share?" Do you use reserves, do you use current output, or do you use one of the various capacity measures that the FTC put forward? The problem with reserves is that they include high cost reserves. And, if so, they do not constrain the price within the timeframe that is relevant for antitrust analysis. Current output does have potential drawbacks. A current supply source that is going to be exhausted imminently might represent a constraint now, but not for very long. In this case, the mine that was closest to running out of reserves was seven and a half years away from running out of reserves. I would not count that as being imminent for the time frame that has to be relevant for this kind of market. So production would have been pretty good.

The use of production would miss the implications of that fourth step on the attached chart—that supply source that can't profitably produce today but could constrain the exercise of market power if the price were to go up. It wasn't clear to me that the alternatives proposed by the FTC handled that problem. In any event, the alternatives proposed by the FTC gave pretty much the same answer as production. So the issue really was: "Do you use reserves or do you use one of the others?" I would go for "one of the others."

Second, does 8800 BTU coal, the high heat content coal, constitute a separate relevant market? What you want in the market is those low cost sources of supply. Presumably the cost of mining coal is driven by the cost of digging it out of the ground, which presumably does not depend much on heat content. If BTUs were the only factor determining cost/BTU, then the high BTU content coal would be the low cost coal. But BTU content is not the only determinant of cost per BTU. Production cost per ton varies across mines. Mines have different locations which give rise to differences in transportation costs. As a result, the heat content per ton isn't a perfect sorter of the low cost vs. the high cost suppliers. On top of that, even if the heat content per ton is the primary determinant of cost per BTU, 8800 BTUs per ton might not be the right cutoff for determining what is in the market. I think the court was probably right to reject the 8800 BTU coal as being a relevant market.

To summarize my points so far, I would take the relevant market as being the production of all the coal in the SPRB. As Andrew pointed out, even with that market definition, the structural change here was quite modest. The increase in the Herfindahl was only about 200, which is sim-

ilar to taking an industry with ten equally sized firms and shrinking it to nine equally sized firms. That normally wouldn't be viewed as much of a problem.

Much has been said about the court's unfortunate assertion that the FTC's theory was novel. But given the weak structural case, the FTC had to come up with something else. A bid-rigging scheme wasn't going to work because the buyers were large and sophisticated; and they designed their bidding schemes to make collusion on the bids difficult. That presumably is why the FTC came up with its theory about the coordination on capacity. There's nothing novel about that economic theory, but it was completely appropriate for the court to evaluate the risk of that threat critically.

Now let me turn to whether coordinated effects were particularly likely as a result of this merger. The decision contains an analysis of whether or not Triton was a disruptive supplier. The court concluded that rather than being a disruptive supplier, Triton bid to be the supplier of last resort. It went on to conclude that the likelihood of coordinated effects was not greatly affected by this merger. I question the court's inference from its analysis of Triton's bidding behavior. Remember from the graph that the suppliers of last resort constrain the price. If the low cost suppliers could get the supplier of last resort to submit higher bids, the price would go up. That theory, it seems to me, would be a better way of articulating the concern that the suppliers expressed about having this merger go through.

Judge Bates's opinion may signal a more searching analysis of coordinated effects theories than has been characteristic of prior court decisions, and if so, I find that neither surprising nor unwelcome.

—Greg Werden

I do think there is some risk that this merger will turn out to be anticompetitive. Whether the court should have blocked the merger really turns on its relative tolerance for false acquittals and false convictions. It was, in my judgment, a close call.

GREG WERDEN: Judge Bates's opinion may signal a more searching analysis of coordinated effects theories than has been characteristic of prior court decisions, and if so, I find that neither surprising nor unwelcome. On the other hand, I think he was wrong, as has already been said, to label the FTC's coordinated effects theory "novel," and I think the D.C. Circuit said as much in its order denying the FTC's emergency motion for injunction pending appeal.

The FTC stressed coordination on capacity and output, and I think capacity was really more the story than output. With briefs not made public, so I've never seen them, the defendants appear to have convinced Judge Bates that this sort of theory was out of line with the FTC's prior litigated merger cases. But when I look at those cases, I come away with the view that the FTC may not have had any theories in these cases, but if they did, they surely didn't have any specific theories. Certainly, these decisions didn't say that some theories were okay and other theories weren't. So I don't take anything away from these cases that suggests that some coordinated effects theories are better than others, and there is no basis in these decisions for saying the FTC's theory was novel. What would be novel, given these decisions, is to have a specific theory, but having a specific theory is a good thing.

As a matter of economics, the FTC's theory makes sense to me, and a lot more sense than a theory of pricing coordination. It's bound to be easier in this market to reach an understanding on the terms of coordination, to monitor that agreement, and to police that agreement when it's about capacities and output than when it's about price. A lot of the opinion talks about how hard it is to coordinate on price, but that wasn't the FTC's theory.

It also seems to me, somewhat contrary to what Andrew was saying, that the FTC did articulate a theory about why the acquisition mattered. The theory was that the transaction would take some capacity away from fringe players and give it to the "big three," which would coordinate their activities. This is a straightforward story about why it is more in the interests of the "big three" to coordinate after the acquisition, and about why the remaining competitors have less ability to

undermine that coordination. So there was a mechanism for how the acquisition mattered even if the number of competitors didn't change. If Andrew is saying that the FTC didn't have any such mechanism, I disagree. If he's saying that the FTC didn't put together all of the pieces of the puzzle, then he may be right.

I also can't agree with Judge Bates that punishment for cheating on coordinated capacities would be ineffective because it would not be detected until well after the fact, if ever. Maybe that is true on price, but not on capacity. It is easy to observe capacity expansions immediately, and cheating can be punished before the first sale of additional output from the expanded capacity. In contrast to most pricing coordination theories, the punishment mechanism in this theory may work especially well. Theoretical work supports the efficacy of this sort of punishment mechanism: If defection from coordination can be punished before it generates any profit, it is easy to enforce coordination in repeated game models.

Although the FTC's theory wasn't novel, or in any way suspect for the reasons suggested by Judge Bates, it did become novel given the findings he made. In his market and with the Buckskin Mine going to Peter Kiewit, the transaction didn't change the number of competitors. I'm fairly confident that there's no precedent for finding a substantially enhanced risk of coordinated effects under a theory that does not involve a change in the number of competitors, so that makes the case novel. But that's not fatal. The FTC did have a theory for why the asset transfer mattered, and that theory made sense economically. Whether it was enough is a different question, and the court did not explicitly decide the question of whether it was enough because the court didn't quite understand that was the question posed. To an extent, however, the question was decided implicitly: The court found that the best measure of share—by no means a perfect measure according to the court, but the best one—indicated the transaction was within the Horizontal Merger Guidelines' safe harbor. And the court found that the North Rochelle Mine, which Arch Coal was acquiring, was a weak competitor, in part because of its high cost. Given these findings, it seemed to the court, not unreasonably, that the transaction just didn't have much effect.

On the subject of assigning market shares, I differ with Mike. A key principle adhered to by both sides is that, if shares are going to be indicative of market power, they have to be based on something real, like control over scarce assets. The FTC advocated such a measure of share—one based on productive capacity at a bottleneck stage of production (as I describe in *Assigning Market Shares*, 70 ANTITRUST L.J. 67, 81–85 (2002)). A coal mine's capacity can be measured in several ways, and the FTC felt the most appropriate measure was "loadout" capacity, which is the current maximum deliverable quantity.

When I studied this industry a long time ago, for reports the Department of Justice was required to prepare for Congress, I concluded that uncommitted reserves were the best basis for assigning shares, and in this case, the defense advocated a reserve-based measure of market share. The FTC disfavored reserves in large part because the mines periodically acquire additional blocks of reserves from the federal government, and different mines find themselves in different positions in this cycle. This may have profound effects on reserve-based shares, but there ought to have been a way to take this cycle into account. In addition, as the court suggested, there ought to have been a way to take into account the fact that some of the reserves were committed to long-term contracts.

Some of the facts I found most important a quarter of a century ago are no longer true in this industry. Back then, a new contract would be large relative to the size of a mine, but that is not at all true now. And the contracts were actually entered into substantially before initial delivery, so it was not necessary to have a mine to compete in this industry; all that was needed was a reserve

base. That's not true now, and with these important changes in circumstances, loadout capacity has become a more sensible measure, but it still may only be relevant for some relatively short-term period of time, and how long is not clear. The court made a finding, with which I'm sure the FTC disagrees, that loadout capacity can be expanded easily and cheaply. The court was unclear about how quickly, and that's important. If it takes years, then maybe loadout capacity is still the relevant measure. If it takes months, then maybe it's not. One thing we know is that loadout capacity has been expanded quite a bit in recent years, and it's expected to be expanded in the future because this is a growing market.

I have one final point on the appropriate share measure. Mike seems to be saying that reserve-based shares are almost never appropriate for natural resource industries, and if that's really his point, I just can't agree. If we assume that loadout capacity can be increased cheaply in a very short amount of time, then it's not an important constraint on the ability of the fringe to undermine the coordination of the big three. Something else has to be that constraint, and I think that has to be reserves. And if you look at the industry a quarter century ago, when I did look at it, a mine was not required in order to compete, so obviously loadout capacity couldn't have been the right basis for assigning shares. In addition, Mike says that it is wrong to include high-cost reserves. Well then, don't include them; use a "right-cost" reserve measure. That may be hard to do, and in many cases there won't be any practical way to do it, but in theory, in many cases, I think it would be the right approach.

Finally, as to the customer testimony, the court made an interesting holding that I think a lot of people misread. The court found that no customer said that the acquisition would lead to increased coordination, and the court held that any such testimony could not have been credited. I understand the court to have said that the latter testimony would have been inadmissible—that customers were not permitted to offer expert opinions about competitive effects relating to price or capacity coordination. I think that's right, and I think all economists ought to stand up for the proposition that lay people must not testify about these subjects. In the *Oracle* and *First Data* cases, the Antitrust Division filed motions to exclude the testimony of industry experts on issues like this. So by and large I agree with what I understand the court to have said relating to customer testimony about likely competitive effects.

But I do take issue with what the court made of customer testimony that bids were "competitive." This is the word that the witnesses apparently used, and the court found it indicative of the market performing competitively. My experience is that lay people don't use economic terminology the way economists use it, and it's terribly wrong to assume they do. I don't think I would have read any of the customer testimony to offer the opinion that the market was currently performing competitively, contrary to what the FTC was arguing. If a customer witness had said: "I did a competitive analysis, and I found that this market is performing competitively," that testimony should have been excluded because the witness was not qualified to offer that kind of opinion testimony.

I think the court was inconsistent in its treatment of customer testimony. If it was going to say: "I can't listen to testimony from customers that the merger would have anticompetitive effects," then it similarly should not have listened to customer testimony that the market currently was performing competitively. One way or another, the court had to be wrong. I think the court misread the testimony that the market was competitive, and it was right to say that testimony that the acquisition would lead to enhanced coordination would have been inadmissible. Thus, I think one of the most criticized parts of the decision is actually one of the most important and correct parts of the decision. I do not see how the Federal Rules of Evidence permit testimony from witnesses with experience as buyers but no specialized knowledge of economics or any other discipline that

would qualify them to opine about increased risk of coordination. That is not something they have any basis for knowing about. They do have a basis to say they're worried that it might happen; they did say it; and the court credited it. But the court also concluded that this testimony didn't get the FTC very far, and I think the court was right about that.

ELIZABETH BAILEY: Before we open up the discussion for questions why don't we give our panelists an opportunity to respond to each other? Andrew, do you want to start?

ANDREW DICK: I will comment briefly on two points raised by Greg and by Michael. I agree with Greg that the FTC did state that its theory was output restriction. I did not mean to imply that the agency was completely silent on that. But I do think that the FTC fell well short in terms of clearly articulating and persuasively demonstrating the mechanisms by which the coordinated output restriction would come to pass. The tenor of recent policy statements is that both agencies will not just state a theory but also will provide detailed support on how their theory of effects would be operationalized by firms. It's on those latter steps where I believe the FTC fell short.

As to Michael's comments, I agree that there are some important economic differences associated with exhaustible resource markets. However, I do not believe that these differences were paramount to the antitrust analysis in this case. First, as Michael noted, because an exhaustible resource has a fixed available stock, prices cannot be permanently higher when supply is monopolized or cartelized. While this is correct, the agencies place much greater weight on the near-term effects of a merger than on its long-run effects. The fact that a higher post-merger price could not have been sustained forever, given the fixed stock of reserves, therefore, was likely not a decisive factor in the court's rejection of the FTC's theory. Parenthetically, I believe that the focus on near-term effects is economically rational. The farther out in the future we project, the greater is the uncertainty that we face about whether a substitute resource might be developed, new reserves might be discovered, or a regulatory change might reduce effective reserves.

My second comment goes to the question of measuring market shares and concentration. Michael noted that high-cost reserves usually would not constrain the market-clearing price. While this is correct, it is true not only in an exhaustible resource market but also in other industries where firms may face a supply curve that eventually slopes upward as a capacity constraint is neared. Michael suggests that a more informative measure of share in an exhaustible resource market may be current production. While I agree that we do not want to use a measure of total reserves inclusive of supply that would likely be uneconomical to mine at any foreseeable price, I think that uncommitted reserves of all actively producing mines would be closer to the measure we seek than current mine production.

MICHAEL SALINGER: I'll stick to the assertion that in a natural resource industry, an upward-sloping supply curve is a more important feature than in the typical manufacturing industry where, at least in the long run, constant returns to scale is a reasonable approximation.

On reserves versus production, my main point was that the market definition should exclude the high-cost sources of supply. In suggesting that production was the right measure of share in this case, or at least was better than reserves, I was conjecturing—and, not having worked on the case, I don't know this to be a fact—that production would do a more effective job of getting rid of the high cost sources of supply. If it is indeed feasible to exclude the high cost reserves, I don't have an opinion about reserves versus production.

GREG WERDEN: I don't want to get into all the complications, but the analysis in this case depended on the fact that there wasn't just a market for BTUs, as Mike suggests. The interaction between the 8800 and the 8400 coal was a lot more complicated than that. The customers were heterogeneous with respect to their locations, their sunk investments in the generating technology designed to use particular types of coal, and their abilities to blend Powder River coals with other coals. I think there was a strong correlation between heat content and the cost of production, but it did not go the way than Mike suggested. The 8800 coal was cheaper to produce than the 8400 coal, I believe. The two types of coal were located in different places, with different seam thicknesses and overburden ratios.

I also want to address Andrew's discussion of my point about the FTC having a theory. I'm not saying the FTC had a theory just because coordination on capacity was mentioned. I'm saying the FTC had a theory because it explained how coordinating on capacity would pay a lot better after the deal than before it, as a result of the fact that productive assets were being taken away from the fringe and given to the "big three." The FTC had a quantitative analysis of the difference in profitability of coordination by the "big three" before versus after, which the FTC's expert said was the basis of his opinion that the acquisition was anticompetitive. Andrew may think that the FTC needed more, and I might agree, but they had the analysis I just described, for which I'm not sure Andrew is giving them credit.

My impression is that antitrust lawyers have a lot of faith in coordinated effects theories and they have doubts about unilateral effects theories. I find both the faith and the doubt baffling.

—Greg Werden

Mike makes an interesting point about the acquired mine being the supplier of last resort and therefore being particularly important to competitive effects theory, but I think the facts are more complicated than he may have let on. According to some of the testimony and some of the court's findings, the acquired mine may not have been the supplier of last resort; rather, it may have been higher up on the supply curve than even that, which would make a difference. However, I don't have any opinion about what the facts actually are.

ELIZABETH BAILEY: I'm going to take the opportunity to ask the first question, because one of the things that I find interesting is that there is such a large number of examples of industries in which firms have colluded successfully, including electrical equipment, folding boxes, diamonds, OPEC, graphite electrodes, and fine arts auctions. It strikes me that this is a really diverse group of industries along a host of dimensions. So the question I have for the panelists is: as economists, how confident are we of both our empirical and theoretical abilities to predict which industries and which market structures are ripe for collusion? And relatedly, do you think we are more or less confident in our abilities to predict a coordinated price increase as opposed to a unilateral price increase?

GREG WERDEN: My impression is that antitrust lawyers have a lot of faith in coordinated effects theories and they have doubts about unilateral effects theories. I find both the faith and the doubt baffling. As an expert witness, I would be worried about having sufficient confidence in a coordinated effects theory to feel comfortable on the witness stand. Economics only lets us make very general statements, and that would bother me. This is not true of unilateral effects. We can make sophisticated predictions based on particular models. We also can quantify the things that matter in these models, and make quantitative predictions.

Moreover, our vague notions about when coordination is likely and when it is not likely are not totally borne out by the data. We see successful coordination among large numbers of firms on occasion, and we find successful coordination in other situations in which our theories say it ought to be hard. One reason firms may have been able to coordinate in these instances is they didn't

coordinate on price. Customer allocation is a common form of coordination and often the best theory in a coordinated effects merger case. The checklist that Andrew talked about is mostly about the wrong things in lots of cases; it's mostly about how hard it is to do things firms are never going to do. Instead, they would do the easy thing—the customer allocation, which we actually find in many cartel cases.

MICHAEL SALINGER: I don't think we should have much faith in our ability to predict with precision when coordinated effects will arise. Nor do I think we should have as much faith as some people suggest in our ability to predict unilateral effects. I think we've made a big mistake in dismissing structural evidence. "Dismissing" is too strong for how that evidence is treated; but, often, structural evidence is the best evidence you have to say that coordinated effects are likely or unlikely. If you think you can go beyond that and say "well, yes, I know in this case we're going to have coordinated effects or not," the science isn't there; and I don't think it's going to be there in my lifetime.

ANDREW DICK: I agree with some but not all of Greg's comment. A lot of the criticism of coordinated effects is based on a straw man version of the checklist. As Greg and Liz correctly pointed out, collusion is believed to have occurred in a wide variety of industries and these industries do not appear to adhere closely to the checklist factors. This may be because firms have found ways to coordinate that overcome the checklist obstacles or perhaps it is because the checklist tells us relatively little about the ability of firms to coordinate. In reality, though, the checklist should be regarded as nothing more than a set of highly stylized facts that can offer guideposts for how we organize and analyze the facts presented in a particular market. The checklist cannot be a substitute for developing and testing hypotheses about how coordination might occur in a particular market and whether or how a merger could make that occurrence more likely. Thus, it is unsurprising that its predictive track-record is somewhat checkered when it comes to analyzing coordination in particular settings.

In that vein, I want to circle back to something that Greg said earlier. The reason that I did not give the FTC much credit for stating its theory of the case was that the agency seemed to do little more than say that the merger would increase the firms' intent and incentive to coordinate. That is true of any concentrating merger, to the extent that the now-larger merged firm has a greater incentive to internalize the benefits of a coordinated output reduction. The FTC's theory, at least as it was articulated and developed, did not speak persuasively to the issue of whether firms would have a greater *ability* post-merger to implement coordination.

GREG WERDEN: The FTC's theory did speak to the profitability of coordination.

ANDREW DICK: I disagree as to whether the FTC's evidence spoke directly to profitability. A firm with a larger market share may have a bigger incentive to see coordination succeed, and this incentive could make the firm more industrious or creative at finding ways to reach and enforce a collusive agreement. But it does not follow necessarily that coordination is in fact more likely to occur.

GREG WERDEN: I think you make some good points, and the FTC's story, at least this part of it, perhaps was not enough. But to simplify and exaggerate, the FTC was saying that, before the acquisition, it didn't make sense for just these three firms to coordinate their output because they would have been eaten alive by the remaining competitors, but after the acquisition, it would make

sense. Three can coordinate; five can't; therefore, the acquisition is anticompetitive. Maybe you need more than that, but that's certainly the germ of coordinated effects theory.

ELIZABETH BAILEY: Let's open this to other questions.

QUESTIONER NO. 1: Leaving aside lots of qualifications and nuances that have been discussed today, I think many of us have the sense that what the judge did say was that coordinated effects needs essentially to be proven almost to the point of having evidence that there is agreement among the parties or there practically is agreement. He also faulted the FTC for not providing expert testimony to demonstrate why coordination would have been likely. If each of you three were on the stand as the expert in this case or a similar case, what kind of evidence would you put forward to demonstrate likelihood? What wasn't put forward here that might have been? And obviously you might have to speculate about what evidence might have been if you'd asked the right questions.

GREG WERDEN: Let me argue with the hypothesis a little bit. The court found that the best measure of market share indicated that the change in the Herfindahl was 49 and that there was no change in the number of competitors. Under these circumstances, I would have been shocked and amazed if the court then found the acquisition was anticompetitive. That the court didn't make that finding, therefore, cannot be interpreted to have imposed a particularly heavy burden on the FTC in general, but rather only when the change in the Herfindahl was 49. I don't think the FTC would have brought the case if they thought the change in Herfindahl was 49. The statistics were released late last year and supplemented this year, so you can look and see what the change in the Herfindahls were in the actual cases, and you are not going to see any cases at 49. In terms of how one could come up with a probability, an actual number, I don't think there is any way. I think economists have to admit they can't do that.

ANDREW DICK: I would respond to the question by noting that the court's opinion identified a germ of a theory, which was that the target firm might have been bidding as if it were a marginal firm. In a coordinated effects setting, that can be a synonym for a maverick firm that is indifferent or on the margin between going along and not going along with coordination. To develop that theory, one would need to find evidence that the target firm actually was the marginal or price-setting bidder. Another way to develop the theory, harkening back to the FTC's allegations about signaling, would involve finding evidence that the target alone did not send or accept signals in the past. As a result, the maverick's actions would have been less predictable, and the merger could have been a mechanism by which this impediment to coordination might have been removed.

GREG WERDEN: Although it would not apply in all coordinated effects cases, of course.

ANDREW DICK: Correct.

MICHAEL SALINGER: I think I'm agreeing with what Andrew said. I would have focused on the bidding rather than the capacity expansion. When Arch bids in a particular instance, it's making some probabilistic assessment of how the price it bids relates to its chances of getting the business, which in turn represents some belief about what others are going to bid. I would try to understand how its acquisition of this mine would have changed that calculation. That's the coordinated effect

that you're worried about, not that they get together in a smoke-filled room and allocate customers. It's the tacit coordination that comes from recognizing they're in a small numbers game.

GREG WERDEN: I think the FTC was basically right in saying that the way the companies would coordinate is by focusing on capacity and production. This is a market in which firms have increased their capacity and production, and they can be expected to do so in the future. A plausible theory of coordination is slower and smaller increases in capacity and production than otherwise would have occurred, rather than an actual decrease in output. So there is a real theory there but no good way based on economic theory to make a specific prediction.

QUESTIONER NO. 2: What does this decision predict for the agencies' reliance on customer testimony in contesting a merger?

GREG WERDEN: I think the future role for customer testimony is no different than it was in the past. Customer testimony is vitally important in merger cases to get at issues like market power and market definition. Customers know about demand, and we need to know about that, but there are lots of things they can't tell us. The thing I take away from *Arch Coal* is that customers should only be listened to when they're telling us about things what they know.

Although there is difficulty in understanding what Judge Walker is saying in the *Oracle* case [*United States v. Oracle Corp.*, 331 F. Supp. 2d 1098 (N.D. Cal. 2004)], a reasonable interpretation is that he concluded that the customers didn't tell him what their demands were. Judge Walker could have been thinking that the customers did not know what they would do in a world different from the world they were living in. The customers knew exactly what to do in the current world, and they were doing it, but they had not investigated all of the possible options, because it wasn't sensible to investigate all the possible options. But if the world changes, the customers may have to get more information and reevaluate their decisions, and they may come to different conclusions. I think what Judge Walker may be saying is that the customers had not gone out and gotten that information yet, so they could not tell us what they would do after this merger. You don't have to read the testimony that way, but if you do, and I think there is a good reason to read it that way, then there isn't much of a lesson for the future except that complicated facts make it difficult to win a merger case. ●