

## Four Key Aspects of the *Tronox/Cristal* Litigation

**Nicholas Hill, Dominic Vote, and Nathan E. Wilson**

■ **Nicholas Hill** is a Partner at Bates White Economic Consulting. **Dominic Vote** is an Assistant Director in the Federal Trade Commission's Mergers II Section, and **Nathan Wilson** is a Deputy Assistant Director in the FTC's Bureau of Economics. During the *Tronox/Cristal* litigation, Dr. Hill testified on behalf of the FTC, Mr. Vote was the FTC's lead trial counsel, and Dr. Wilson provided economic analysis to the FTC. The views expressed in this article are solely those of the authors, who are responsible for the content, and are not purported to reflect the views of Bates White Economic Consulting, the Federal Trade Commission, or any of its Commissioners. The authors are grateful for comments from Bruce Hoffman and Dave Schmidt.

On December 5, 2017, the Federal Trade Commission filed a complaint in its administrative court alleging that Tronox Limited's proposed acquisition of National Titanium Dioxide Company's titanium dioxide assets (Cristal) would substantially reduce competition.<sup>1</sup> While that court's decision was pending, the FTC also petitioned the D.C. District Court on July 10, 2018, to issue a preliminary injunction to prevent Tronox from closing the proposed acquisition before the administrative court could issue its decision. The federal court issued the preliminary injunction on September 5, 2018, finding that the FTC had demonstrated a likelihood of anticompetitive effects and that the preliminary injunction was in the public interest. Then, on December 17, 2018, the administrative court upheld the FTC's complaint. Subsequently, the parties agreed to settle the FTC's charges by divesting all of Cristal's North American titanium dioxide assets.

The opinions of the federal and administrative courts broke ground in a number of areas and have important implications for antitrust practitioners. In this article we discuss what we see as four key aspects of these decisions, and explain their potential implications for the federal antitrust agencies and the private bar. These key aspects are: (1) clarifying the importance of evidence directly addressing customer responsiveness when defining relevant markets; (2) providing support for theories of harm focused on strategic withholding of output; (3) showing that arguments about Chinese expansion must be more than theoretical to overcome competition concerns; and (4) demonstrating that the agencies remain willing and able to bring—and win—coordinated effects cases.

Before turning to what we see as key takeaways from the litigation, we begin with some background on titanium dioxide.

### Background on Titanium Dioxide

Rutile titanium dioxide is used to provide brightness and opacity to paints, plastics, paper, and other products.<sup>2</sup> It is produced by interacting a titanium-bearing feedstock with either chlorine or sulfuric acid. These two approaches are commonly referred to as the chloride process and the sulfate process, respectively. Although both manufacturing processes result in titanium dioxide products suitable for use in a variety of final goods, the different reactions have an enduring impact on the output. Chloride-process titanium dioxide tends to be brighter and more durable than sulfate-process titanium dioxide. Moreover, the chloride process imparts a bluish tint relative to sulfate-process titanium dioxide's more yellow hue.<sup>3</sup>

<sup>1</sup> Publicly available details on the administrative and district court litigation can be found on the FTC's website, <https://www.ftc.gov/enforcement/cases-proceedings/171-0085/tronoxcristal-usa> and <https://www.ftc.gov/enforcement/cases-proceedings/171-0085/tronox-limited-et-al-ftc-v>. In this case, the FTC filed an administrative complaint but did not immediately seek a preliminary injunction in district court because of an ongoing review in the European Union that precluded closing at that time.

<sup>2</sup> The other form of titanium dioxide, anatase, has very different end uses, including inks, sun screens, and edible applications such as Oreos.

<sup>3</sup> *FTC v. Tronox*, 332 F. Supp. 3d 187, 195 (D.D.C. 2018).

World-wide production of chloride-process and sulfate-process titanium dioxide are roughly equal. However, the distribution of production by process varies significantly across regions. In the United States and Canada, which are frequently referred to as North America in the industry, 99 percent of titanium dioxide is produced using the chloride process.<sup>4</sup> Consumption of titanium dioxide varies significantly by process type across regions, as we discuss further below.

### **Direct Evidence of Customer Responsiveness Is More Convincing Evidence of the Relevant Market than Price Co-Movement**

The FTC argued that the supply of chloride-process titanium dioxide to customers in North America is a relevant market. In other words, the agency defined the relevant geographic market on the basis of customer locations, and not supplier locations. Such a price discrimination market implies that North American customers strongly prefer chloride-process titanium dioxide relative to sulfate-process titanium dioxide, and that pigment suppliers are able to charge a different price in North America than in other regions. In both the federal and administrative court trials, the FTC supported its market definition using both qualitative and quantitative evidence.

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The qualitative evidence consisted of testimony and documents from customers and producers. For example, Tronox's CEO testified at the district court hearing that "the way things have developed here in the United States is as a chloride market."<sup>5</sup> This statement was given context by other witnesses. For example, a producer witness testified in the same proceeding that chloride-process titanium dioxide is whiter, brighter, more durable, and more "scrubbable" than sulfate-process titanium dioxide, and that North American consumers demanded these characteristics in their final goods. Similar evidence—documentary and testimonial—was presented in administrative court.<sup>6</sup> The distinct demand of North American customers for chloride-process material was further reinforced by a customer witness who testified in district court "that chloride and sulfate TiO<sub>2</sub> are 'not substitutable on a color basis' and that 'if you don't want [a paint product] to degrade or fade' the product would "require chloride."<sup>7</sup>

Overall, the witnesses and documentary evidence supported the argument that, for the customers, differences imparted by the sulfate and chloride production processes are sufficiently large that altering formulations to achieve equivalent performance using sulfate-process titanium dioxide might not be feasible and would likely not be commercially viable.<sup>8</sup>

The quantitative evidence presented on behalf of the FTC ranged from simple to complex, but its orientation was consistently on the core question of market definition: how do customers respond to price changes? As with the qualitative evidence, the empirical work presented by the FTC supported the conclusion that sulfate-process titanium dioxide was not a good substitute for most North American customers.<sup>9</sup>

At the simple end of the analytical spectrum, the FTC presented data showing that 90 percent of all rutile titanium dioxide purchased in the United States and Canada is made using the chloride process, and that this percentage has been consistent over time. Notably, this was true

<sup>4</sup> *Id.* at 194.

<sup>5</sup> *Tronox*, 332 F. Supp. 3d at 199.

<sup>6</sup> Initial Decision at 13–14, *Tronox*, Docket No. 9377, (Dec. 14, 2018) (Chappell, ALJ) [hereinafter *Tronox* Initial Decision], [https://www.ftc.gov/system/files/documents/cases/docket\\_9377\\_tronox\\_et\\_al\\_initial\\_decision\\_redacted\\_public\\_version\\_0.pdf](https://www.ftc.gov/system/files/documents/cases/docket_9377_tronox_et_al_initial_decision_redacted_public_version_0.pdf).

<sup>7</sup> *Tronox*, 332 F. Supp. 3d at 199.

<sup>8</sup> *Id.* at 199–201.

<sup>9</sup> *Id.* at 203–05.

despite the fact that the relative price of chloride-process over sulfate-process titanium dioxide changed over time.<sup>10</sup> The FTC argued that if North American customers were willing to switch significant volume between processes, one would have expected chloride-process titanium dioxide's share to vary meaningfully—but it did not.<sup>11</sup>

At the complex end, the FTC provided multiple hypothetical monopolist tests to support its market definition. These included two tests that used estimates of consumers' willingness to substitute away from chloride-process titanium dioxide in response to price increases that were drawn from analysis sponsored by the merging parties.<sup>12</sup>

The defendants, conversely, argued that a product market of chloride-process titanium dioxide was too narrow and that sulfate-process titanium dioxide should also be included in the market. Similarly, they argued that the relevant geographic market was the entire world rather than just North America. Qualitatively, the parties emphasized documents and analyses suggesting that sulfate-process material *could* be used in lieu of chloride-process titanium dioxide. While such evidence can be useful, it does not directly speak to the critical question of understanding consumers' willingness to switch (i.e., *would* consumers switch).

Quantitatively, the parties' emphasized evidence that chloride-process and sulfate-process titanium dioxide prices inside and outside of North America have tended to move in similar ways.<sup>13</sup> For example, Dr. Ramsey Shehadeh, who testified on behalf of the merging parties, summarized this view by stating that, "Economically significant co-movement between prices for chloride-produced TiO<sub>2</sub> and prices for sulfate-produced TiO<sub>2</sub> establishes a single market."<sup>14</sup>

The argument that co-movement analyses can be used to define a market is not new. It dates at least to the work of George Stigler and Robert Sherwin in 1985.<sup>15</sup> The approach has been especially popular with practitioners evaluating mergers in commodity markets in the United States and other countries.<sup>16</sup> The reason for the enduring appeal of the approach is simple: intuition suggests that the prices of goods in the same market should behave in similar ways. However, the economics and legal literature acknowledge the shortcomings of using these methodologies to define antitrust markets.<sup>17</sup> This is because co-movement methodologies suffer from several significant flaws that will often make them unreliable for purposes of market definition.

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<sup>10</sup> See Complaint Counsel's Post-trial Proposed Findings of Fact and Conclusions of Law Following the Administrative Trial § 371 (Aug. 24, 2018), <https://www.ftc.gov/system/files/documents/cases/081418ccfindingsoffactconclusionsoflaw591858.pdf>.

<sup>11</sup> *Tronox*, 332 F. Supp. 2d at 200.

<sup>12</sup> *Tronox* Initial Decision, *supra* note 6, at 29–30.

<sup>13</sup> Specifically, the parties presented statistical evidence relating to the correlations, partial correlations, and cointegration of the different price series. The degree to which two data series are correlated reflects the extent to which a movement in one is paralleled by a simultaneous move in the other. Partial correlation statistics measure two data series' correlation after the possible influence of confounding information is controlled for. And intuitively speaking, cointegration refers to the existence of an equilibrium relationship between two data series. It involves more formal econometric analysis than either correlation or partial correlation analyses.

<sup>14</sup> *Tronox*, 332 F. Supp. 3d at 201.

<sup>15</sup> George Stigler & Robert Sherwin, *The Extent of the Market*, 28 J.L. & ECON. 555 (1985).

<sup>16</sup> See, e.g., John Hayes, Carl Shapiro & Robert Town, *Market Definition in Crude Oil: Estimating the Effects of the BP/ARCO Merger*, 52 ANTITRUST BULL. 179 (2007); Benoit Durand & Valerie Rabassa, *The Role of Quantitative Analysis to Delineate Antitrust Markets: An Example. Blackstone/Acetex*, COMPETITION POL'Y NEWSL. 118 (2005).

<sup>17</sup> See, e.g., Jonathan B. Baker, *Why Price Correlations Do Not Define Antitrust Markets* (7 Fed. Trade Comm'n Working Paper No. 149 (1987)) ("[P]rice correlation tests contain little or no information relevant to the issue of antitrust market definition."); PHILLIP E. AREEDA & HERBERT HOVENKAMP, ANTITRUST LAW ¶ 534c (4th ed. 2014) ("[R]ather than high cross-elasticity of demand, correlated price movements might reflect the similar responses of different markets to similar changes, as when all prices move up in response to changes in common costs."); see also Gregory J. Werden & Luke Froeb, *Correlation, Causality, and All that Jazz: The Inherent Shortcomings of Price Tests for Antitrust Market Delineation*, 8 REV. INDUS. ORG. 329 (1993).

*In short, the available evidence indicates that one should hesitate to draw conclusions on the basis of correlation and cointegration analyses.*

Like documents that suggest outputs *could* be made with different types of inputs, tests of whether prices are correlated or cointegrated do not directly address the hypothetical monopolist test: *would* a 5 percent increase in one product's price lead to significant substitution to products outside the hypothetical market? Instead, such co-movement analyses address whether or not a statistical relationship exists between two products' prices. Such evidence is insufficient for market definition because there may be both demand-side (e.g., if both products have seasonal demand) and supply-side (e.g., if the two products have common inputs) reasons that different price series might be statistically related while still being in different antitrust markets.

In practice, the existence of these confounding reasons will often make it difficult to be confident that prices move together solely because of demand-side substitution. Consistent with this, the available empirical evidence in the academic literature suggests that cointegration analyses commonly result in false positives—that is, that co-movement analysis will tend to define excessively broad markets.<sup>18</sup> For example, the prices of crude oil and propane gas are both highly correlated and cointegrated, but few consumers would power their barbeques using crude oil in response to a modest increase in the price of propane gas.<sup>19</sup>

In short, the available evidence indicates that one should hesitate to draw conclusions on the basis of correlation and cointegration analyses. This is particularly true when they contradict the implications of more direct evidence—qualitative or quantitative—about the contours of the relevant market.

Despite their well-known shortcomings, prior to the *Tronox-Cristal* litigation, we are aware of no U.S. court that has opined on whether correlation and cointegration analysis is reliable for defining markets in a merger case.<sup>20</sup> The district court changed that by weighing in clearly and decisively:

Price correlation between the two types of TiO<sub>2</sub> may reflect changes in feedstock prices, or a correlation in the demand for different types of paint (like low-end traffic marking paint, which tends to use sulfate TiO<sub>2</sub>, and high-end exterior paint, which uses the chloride pigment). In other words, “rather than high cross-elasticity of demand, correlated price movements might reflect the similar responses of different markets to similar changes, as when all prices move up in response to changes in common costs.”<sup>21</sup>

The district court went on to emphasize this logic by way of example:

<sup>18</sup> Multiple econometric studies have found that in the absence of very rich data, the popular Johansen cointegration test, as is often applied, is prone to false positives. See, e.g., Cheung Yin-Wong & Kon S. Lai, *Finite-Sample Sizes of Johansen's Likelihood Ratio Tests for Cointegration*, 55 OXFORD BULL. ECON. STAT. 313 (1993); Mindy Mallory & Sergio H. Lence, *Testing for Cointegration in the Presence of Moving Average Errors*, 4 J. TIME SERIES ECONOMETRICS (2012). Other papers document that the Johansen test can have low power (i.e., high false negatives) when the sample size is small. For example, Hiro Y. Toda, *Finite Sample Performance of Likelihood Ratio Tests for Cointegrating Ranks in Vector Autoregressions*, 11 ECON. THEORY 1015 (1995).

<sup>19</sup> Data used for this example were obtained from the Federal Reserve Economic Data (FRED) website, <https://fred.stlouisfed.org/>. The FRED series used are Crude Oil Prices: West Texas Intermediate—Cushing, Oklahoma (DCOILWTICO) and Propane Prices: Mont Belvieu, Texas (DPROPANEMBTX). We used daily price data from April 30, 2008 to April 30, 2018. Further details are available from the authors upon request.

<sup>20</sup> In the *In Re Mushroom Direct Purchaser Antitrust Litigation*, the plaintiff's economic expert used correlations as part of his market definition exercise. The defendants moved to exclude his opinions on the basis that he only considered correlations. The district court judge held a *Daubert* hearing to consider the motion. Ultimately, the judge denied their motion. However, in denying the motion, the judge noted that the plaintiff's expert “uses price correlation as only one piece of evidence supporting his product definition.” *In Re Mushroom Direct Purchaser Antitrust Litig.*, No. 06-0620, at 42 (E.D. Pa. July 29, 2015).

<sup>21</sup> *Tronox*, 332 F. Supp. 3d at 201 (citing AREEDA & HOVENKAMP, *supra* note 17, ¶ 534c).

[T]he mere fact that the prices of two goods move upward or downward together need not mean that they are substitutes. As Dr. Hill explained during the evidentiary hearing, “If you think about the sale of hamburger buns and hot dog buns, their prices will be highly correlated. Their demands are both seasonal—high in the summer, low in other seasons—and they’re made with the same ingredients. So their prices will be highly correlated. But they’re not close substitutes for one another.”<sup>22</sup>

The administrative court agreed, writing, “Even if prices are correlated, this does not show that the products are reasonably substitutable for each other, especially in light of the proof that TiO<sub>2</sub> customers do not substitute.”<sup>23</sup>

It is our hope that the courts’ opinions, in addition to the conclusions in the economic and legal literatures, will put an end to the use of correlation and cointegration tests to define antitrust markets when more direct evidence is available.<sup>24</sup> Similarly, we hope that the opinions lead all litigants to emphasize qualitative evidence on customers’ willingness to switch in the face of a price increase and not solely the technical feasibility of such a change. As the district court ruled, “The relevant question concerns not just the hypothetical possibility of substitution, but whether customers do in fact exhibit a willingness to substitute chloride- and sulfate-process TiO<sub>2</sub> . . . .The evidence from customers and suppliers suggests a lack of significant interchangeability between chloride and sulfate TiO<sub>2</sub>.”<sup>25</sup>

### Strategic Output Withholding Is Validated as a Theory of Harm

The price in a commodity market is set by the balance between supply and demand. A firm in such a market can raise the market price by withholding output from the market. Whether doing so is profit-maximizing depends upon the balance between the benefits and costs associated with output withholding. The benefit is that a higher market price means a higher margin on the output that the firm does not withhold. The cost is that the firm must give up the margin that it could have earned on the withheld output. A firm will have an incentive to withhold output if the gains from higher margins on the remaining quantity exceed the lost earnings on the withheld output.

Now consider a merger of two firms in a commodity industry and the payoff to an output withholding of a fixed size. The merged firm will be larger than either stand-alone firm, so it will benefit more from withholding a unit of output than did either of the stand-alone firms. That is because the merged firm has more output on which to enjoy the benefits of the higher price that will result from the output withholding.<sup>26</sup> The cost of output withholding of a fixed size is, naturally, the same to the merged firm and the stand-alone firms. The merged firm will therefore have more incentive

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<sup>22</sup> *Id.* (citing trial transcript).

<sup>23</sup> *Tronox* Initial Decision, *supra* note 6, at 21.

<sup>24</sup> When more direct evidence is not available, co-movement analyses may be worth considering. In particular, the capacity of cointegration techniques to sometimes address the problem of spurious correlation make them interesting options. However, we see the cautionary words of Davis and Garcés as quite apropos:

While in principle, under special circumstances, you may not have an endogeneity problem, you certainly will not have escaped the fundamental identification problem that both supply and demand curves depend on prices and quantities. Investigators with limited knowledge in the cointegration arena are therefore advised to proceed with extreme caution when attempting to apply complex econometric arguments with sometimes subtle implications. The risk of being led seriously astray by apparently extremely attractive econometric theorems is very high.

PETER DAVIS & ELIANA GARCÉS, *QUANTITATIVE TECHNIQUES FOR COMPETITION AND ANTITRUST ANALYSIS* 182–83 (2010).

<sup>25</sup> *Tronox*, 332 F. 3d at 200.

<sup>26</sup> One way to think about output withholding is to notice that output withholding generates a positive externality for all market participants in the form of a higher price. The larger a firm’s market share is, the more of the positive externality it captures, and hence the greater is its incentive to withhold output.

to withhold output than did the stand-alone firms (though output withholding need not be profit maximizing for the merged firm).

This basic intuition behind strategic output withholding theories of harm is well understood and accepted in the economic and legal literatures. Indeed, it is explicitly discussed in the joint DOJ-FTC Horizontal Merger Guidelines<sup>27</sup> in a section entitled “Capacity and Output for Homogeneous Products.” This section of the Guidelines begins with a high-level summary of strategic output withholding theories of harm: “In markets involving relatively undifferentiated products, the Agencies may evaluate whether the merged firm will find it profitable unilaterally to suppress output and elevate the market price.”<sup>28</sup> They then articulate the mechanism, explaining that, “A merger may provide the merged firm a larger base of sales on which to benefit from the resulting price rise, or it may eliminate a competitor that otherwise could have expanded its output in response to the price rise.”<sup>29</sup>

*The merged firm will therefore have more incentive to withhold output than did the stand-alone firms . . .*

Despite the broad recognition by antitrust practitioners of strategic output withholding as a theory of harm, there was little, if any, unambiguous support for them in merger case law prior to the *Tronox-Cristal* cases.<sup>30</sup> The district court remedied this deficiency by resting its conclusion that the transaction “raises serious and substantial questions about likely anticompetitive effects” on a strategic output withholding theory:

The available real-world evidence thus suggests that (1) to counter declining prices, chloride TiO<sub>2</sub> producers have incentives and the means to withhold supply, and (2) the proposed transaction, which would create two firms with nearly three-quarters of the total market share, will likely increase these incentives and make implicit price coordination easier.<sup>31</sup>

Embracing the FTC’s strategic output withholding theory required the courts to accept the notion that it may be profit maximizing for a firm to decline to make profitable sales in the hopes of driving up the market price—and thereby earn a higher total profit. This notion, while broadly accepted in the academic antitrust literature, can be counterintuitive for lay audiences. In this matter, however, the FTC pointed to a host of information to establish that the theory was consistent with real-world evidence from the titanium dioxide industry.<sup>32</sup>

That the output withholding theory was supported by both qualitative and quantitative evidence is one of the key themes of the district court’s opinion: i.e., what Judge McFadden referred to as the “economic realities” of the industry broadly matched the theory of harm described by the FTC Complaint and the economic testimony given by the FTC’s testifying expert.<sup>33</sup> This broad consistency appears to have been decisive in helping the district court overcome any qualms that it might have had about “decisively sift[ing] through various models and theories.”<sup>34</sup>

<sup>27</sup> U.S. Dep’t of Justice & Fed. Trade Comm’n, Horizontal Merger Guidelines sec. 6.3 (2010) [hereinafter Guidelines], <http://ftc.gov/os/2010/08/100819hmg.pdf>.

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

<sup>30</sup> Output withholding theories tend to be more common in price fixing litigation, where typically a large group of firms is accused of withholding output collectively. See, e.g., *In re Linerboard Antitrust Litig.*, 305 F.3d 145 (3d Cir. 2002).

<sup>31</sup> *Tronox*, 332 F. Supp. 3d at 210. While FTC staff presented the same theories of harm to both the administrative and district courts, the ALJ ultimately did not opine on the likelihood of unilateral strategic output withholding. *Tronox* Initial Decision, *supra* note 6, at n.13.

<sup>32</sup> For example, an email from a senior Tronox executive stated explicitly that “to stop the price erosion in the market we reduced the production output in our pigment plants mid 2015 by 15%.” *Tronox*, 332 F. Supp. 3d at 208. Evidence from other competitors presented to the district court similarly referred to a history of idling or dialing back production. *Id.*

<sup>33</sup> *Id.* at 198, 212.

<sup>34</sup> *Id.* at 212.

## China Is Not a Panacea for the Defense in Cases Involving Commodities

Before ongoing trade disputes resulted in extensive tariffs on Chinese goods, a common refrain for parties advocating for mergers in manufacturing industries is that the likelihood of entry or expansion by Chinese—or other emerging market—producers would preclude any anticompetitive effect. In the *Tronox-Cristal* matter, the parties made just such an argument, focusing on the alleged competitive constraint imposed by the entry and expansion of Chinese titanium dioxide producers.<sup>35</sup> They particularly emphasized the looming threat of competition from Lomon-Billions, the largest Chinese producer. The district court, however, was not persuaded, writing, “But the pertinent question here is whether the emergence of Lomon Billions can be ‘rapid enough to make unprofitable overall the [predicted] actions’ that otherwise lead to the Commission’s concerns about anticompetitive effects. Merger Guidelines § 9.1. The evidence suggests that it cannot.”<sup>36</sup>

In reaching this conclusion, the court focused upon three pieces of evidence: (1) the current share of Chinese producers in the North American chloride-process titanium dioxide market is less than 1 percent;<sup>37</sup> (2) there are significant entry barriers, particularly the fact that Chinese producers have struggled to master the chloride process and produce high-quality chloride-process titanium dioxide;<sup>38</sup> and (3) Chinese demand is projected to grow rapidly, absorbing any increase in production.<sup>39</sup> Based on similar reasoning, the administrative court also concluded that entry or expansion by Chinese suppliers was not likely to offset any anticompetitive effects from the transaction.<sup>40</sup>

There are two important messages here. First, appeals to the disciplining power of Chinese producers are more likely to be successful when based on current market facts rather than speculation about what the future may hold.<sup>41</sup> Second, it is important to consider the economic incentives of Chinese producers. Producers outside the United States do not focus exclusively on the North American market, and will emphasize opportunities that lead to the greatest benefit for them. Here, the court cited extensive evidence that expansion of Chinese chloride-process production would likely be used to satisfy growing, proximate Asian demand for chloride-process titanium dioxide, rather than to ship output significant distances to expand in the North American market in response to a small but significant and sustained price increase.

The decisions in *Tronox* are not an indication that competition from China cannot play an important role when advocating for a merger. Rather, the bottom line for practitioners should be that an appeal to China, if it is to be more than a Hail Mary pass, should likely include evidence of significant present sales by Chinese firms, or evidence that Chinese firms would have both the ability and the incentive to expand or reposition in response to a small increase in price. In the case

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<sup>35</sup> “Chinese producers have already ‘transformed the global market, continuing to take market share from Western producers.’ Chinese competition has grown incredibly in a matter of just a few years, and the quality of Chinese TiO<sub>2</sub> ‘gets better every day.’” Respondents’ Post-Trial Reply Brief at 43, *Tronox* (Sept. 11, 2018), [https://www.ftc.gov/system/files/documents/cases/d09377\\_rs\\_post-tr\\_reply\\_brief\\_public\\_592136.pdf](https://www.ftc.gov/system/files/documents/cases/d09377_rs_post-tr_reply_brief_public_592136.pdf).

<sup>36</sup> *Tronox*, 332 F. Supp. 3d at 213.

<sup>37</sup> *Id.*

<sup>38</sup> *Id.* at 214.

<sup>39</sup> *Id.*

<sup>40</sup> *Tronox* Initial Decision, *supra* note 6, at 45–50.

<sup>41</sup> Tellingly, the court draws a parallel between the defendants’ appeal to Chinese producers in this case and the appeal to Amazon in the most recent *Staples-Office Depot* case, *FTC v. Staples Inc.*, 190 F. Supp. 3d 100, 114 (D.D.C. 2016). *Tronox*, 332 F. Supp. 3d at 214–15.

of Tronox and Cristal, both the district court and the FTC administrative court found such evidence to be lacking.

### Coordinated Effects Theories Are Alive and Well

Over the past several years, the Agencies have not typically focused on coordinated effects theories in merger litigation. Instead, unilateral effects have generally been at the center of cases that have ended up in court. While the scholarly literature has recognized that coordinated effects theories have been and remain integral to antitrust enforcement,<sup>42</sup> the relative absence of litigation of cases involving coordinated effects theories may have led some observers to conclude that it was no longer likely that a coordinated case might be brought (let alone won) in all but the most extreme of circumstances. Indeed, the American Bar Association organized a recent panel to discuss whether or not coordinated effects were “alive or dead.”<sup>43</sup> The *Tronox* case (as well as a closer reading of the Agencies recent activity) shows that any belief that coordinated effects has “died” would be misplaced, and provides some useful insights for practitioners dealing with matters where coordinated effects may be an issue.

*In Tronox, the FTC alleged that the market for titanium dioxide was characterized by multiple features making it vulnerable to coordination.*

In *Tronox*, the FTC alleged that the market for titanium dioxide was characterized by multiple features making it vulnerable to coordination.<sup>44</sup> This matched the conclusions of the Third Circuit and the Maryland District Court in prior price-fixing litigation cases.<sup>45</sup> Specifically, the FTC noted that the market concerned a commodity-like product, a high level of concentration, a small number of rivals with significant visibility into each other's competitive and strategic decisions, a low market elasticity of demand, and a history of strong interdependent behavior.<sup>46</sup> Not only would the transaction lead to an even smaller number of actors and higher levels of concentration, but the FTC argued also argued that it would facilitate coordination by increasing symmetry between Tronox and Chemours.<sup>47</sup>

The administrative court found that the facts supported the FTC's allegations. Consistent with this, it ruled: “[T]he evidence proves that the North American chloride TiO<sub>2</sub> market is vulnerable to coordinated conduct, and that this vulnerability will be enhanced by the Acquisition.”<sup>48</sup> Similarly, the district court concluded: “A Tronox-Cristal merger will make TiO<sub>2</sub> supply reductions easier to coordinate through implicit understanding and sheer market power, in a market where producers have already shown an awareness that implicit coordination would be beneficial.”<sup>49</sup>

<sup>42</sup> For example, Loertscher and Marx opine that coordinated effects “play a prominent role in antitrust thinking and practice.” Simon Loertscher & Leslie Marx, *Coordinated Effects*, Mimeo (2019), <https://faculty.fuqua.duke.edu/~marx/bio/papers/coordefects.pdf>.

<sup>43</sup> <https://www.americanbar.org/events-cle/mtg/teleconference/358712326/>. This panel took place following the *Tronox* decisions, and a central element of the discussion was that coordinated effects theories were (and had consistently been) very much alive.

<sup>44</sup> FTC Complaint at 9, Docket No. 9377, *Tronox* (Dec. 7, 2017) [hereinafter FTC *Tronox* Complaint], [https://www.ftc.gov/system/files/documents/cases/docket\\_no\\_9377\\_tronox\\_cristal\\_part\\_3\\_administrative\\_complaint\\_redacted\\_public\\_version\\_12072017.pdf](https://www.ftc.gov/system/files/documents/cases/docket_no_9377_tronox_cristal_part_3_administrative_complaint_redacted_public_version_12072017.pdf).

<sup>45</sup> See *Valspar v. E.I du Pont de Nemours and Co.*, 2017 WL 4364317 (3d Cir. Sept. 14, 2017), and *In re Titanium Dioxide Antitrust Litig.*, RDB-10-0318 (D. Md. Aug. 14, 2013), respectively.

<sup>46</sup> For details on the FTC's theory, see FTC Complaint, *supra* note 44, section VIII at 9–10. Economic models have shown that symmetry can facilitate collusion in markets where firms strategically set outputs.

<sup>47</sup> See Complaint Counsel's Post-Trial Proposed Findings of Fact and Conclusions of Law Following the Administrative Trial §§ 545–550, *Tronox* (Aug. 14, 2018), <https://www.ftc.gov/system/files/documents/cases/081418ccfindingsoffactconclusionsoflaw591858.pdf>. For details on the economic theory connecting symmetry to increased coordination, see, e.g., Helder Vasconcelos, *Tacit Collusion, Cost Asymmetries, and Mergers*, 36 RAND J. ECON. 39 (2005).

<sup>48</sup> *Tronox* Initial Decision, *supra* note 6, at 43.

<sup>49</sup> *Tronox*, 332 F. Supp. 3d at 209.

In finding that the transaction created a reasonable likelihood of coordinated effects, both the district court and the administrative court explicitly acknowledged that merger cases are typically focused on the likelihood of tacit coordination, rather than explicit price fixing. While practitioners often argue to the Agencies that coordination in the merger context is unlikely because of the difficulties in reaching and policing an agreement, Judge McFadden clearly articulated that the concern should be whether the merger increases the likelihood of softer forms of competition. Post-merger, he noted that “Chemours and the Tronox-Cristal entity would often be able to maintain price discipline and control supply in a post-merger market simply by competing less vigorously against each other for major accounts.”<sup>50</sup> As the district court further explained, such conduct is not illegal when initiated by independent firms, but is nevertheless a “core” concern when assessing mergers: “There is, of course, nothing improper about a firm making independent production decisions to maximize profits. But a core purpose of antitrust law is to scrutinize mergers that may make it easier for firms to collectively reduce output, and indeed, to prevent mergers that are likely to do so.”<sup>51</sup>

This analysis reinforces that the Agencies need not demonstrate a high likelihood of future or past price fixing (i.e., explicit collusion) to prevail in blocking a merger—instead, the Agencies can prevail solely by showing an increased risk of tacit coordination.<sup>52</sup> Effective advocacy about coordinated effects should therefore acknowledge, and seek to address, that investigating staff are often more likely to be concerned about facilitating or strengthening tacit rather than explicit cooperation amongst competitors.

## Conclusion

The *Tronox* opinions may reduce the litigation risk that the Agencies may have sometimes felt when challenging a proposed merger based upon a strategic output withholding theory of harm. Moreover, they have clarified the circumstances under which the Agencies may bring coordinated effects cases. Both impacts will likely lead to more case law developing as such theories appear more often in litigated matters. Conversely, the results of the *Tronox* litigation will likely significantly lessen the appeal of using co-movement analyses to define markets and force discussion of purported entry threats posed by China to be firmly grounded in the economic realities of the market. ●

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<sup>50</sup> *Id.* at 30; see also *Tronox* Initial Decision, *supra* note 6, at 42 (“[I]t is not necessary to demonstrate that market participants can form and enforce an agreement.”).

<sup>51</sup> *Tronox*, 332 F. Supp. 3d at 208–09; see also *Tronox* Initial Decision, *supra* note 6, at 121 (“It is a central object of merger policy to obstruct the creation or reinforcement by merger’ of market structures in which tacit coordination can occur.”).

<sup>52</sup> The titanium-dioxide industry has a history of private price-fixing litigation. See FTC *Tronox* Complaint, *supra* note 44 (discussion and citations). The district court did not rule on whether the alleged history of price fixing was grounds for blocking the merger. See *Tronox*, 332 F. Supp. 3d at 209 n.12.