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ANTITRUST'S INTERDEPENDENCE PARADOX

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INTRODUCTION

Price-fixing conspiracies are the "supreme evil" that Congress intended antitrust laws to deter and to punish.[1] Because price fixers face ten-year prison sentences, criminal fines, and private liability often measured in the hundreds of millions of dollars, price-fixing conspirators generally undertake elaborate measures to conceal their collusion. Consequently, direct evidence of collusion is rarely available, and private plaintiffs must rely on circumstantial evidence to prove their antitrust cases.

Remarkably, federal courts have applied an unproven economic theory to effectively immunize the most likely price-fixing conspiracies from antitrust liability. Price-fixing cartels are more probable in concentrated markets with very few firms, generally called oligopoly markets. Price fixing requires coordination and concealment, which are easier in oligopoly markets. Recent antitrust opinions, however, have made it significantly more difficult for antitrust plaintiffs to prove collusion through circumstantial evidence in precisely these markets, the ones most prone to price-fixing conspiracies. This creates a paradox in antitrust law: the most likely conspiracies are the hardest to prove.

The predicament flows from judicial misapplication of interdependence theory. Interdependence describes the phenomenon of businesses pricing their products based on predicting how their competitors will respond.[2] Interdependence theory predicts that firms in a concentrated market may be able to "coordinat[e] their pricing without an actual agreement to do so."[3] Invoking this interdependence theory, federal courts assert that price-fixing conspiracies are unlikely to occur in concentrated markets because the rival firms do not need to conspire: they can simply observe each other from a distance. Consequently, judges

[1] See Verizon Commc'ns, Inc. v. Law Offs. of Curtis V. Trinko, LLP, 540 U.S. 398, 408 (2004) (describing collusion as "the supreme evil of antitrust").

[2] See 6 Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law: An Analysis of Antitrust Principles and Their Application ¶ 1410a, at 71 (4th ed. 2017) ("'Interdependence' refers to a state of affairs in which each person's actions depend on his perception of how others will act.").

[3] In re Text Messaging Antitrust Litig., 782 F.3d 867, 871 (7th Cir. 2015).

discount circumstantial evidence of collusion when price-fixing defendants operate in market structures that are the most conducive to price fixing. As a result, price-fixing conspirators are often insulated from antitrust liability.[4]

Part I of this Article explains how antitrust plaintiffs must often prove price fixing through circumstantial evidence. This generally requires the plaintiffs to show that the defendants raised their prices in unison and that these parallel price increases were the result of collusion, not independent decision-making. Plaintiffs prove the second step by presenting evidence of plus factors, which are facts and circumstances that make it more likely that price rises were produced by collusion rather than independent parallel action. Courts have long recognized market structure as an important plus factor because concentrated markets are more susceptible to illegal cartelization. Firms in such markets will find it easier to negotiate their cartel agreement, to exclude non-cartel rivals from the market, to enforce their illegal accord, and to conceal their price-fixing conspiracy from antitrust officials and consumers.

Part II explains how courts have also assumed that price-fixing conspiracies do not occur in concentrated markets. Using interdependence theory, several courts have eliminated market concentration as a plus factor even though market concentration facilitates price-fixing conspiracies. Moreover, courts have invoked interdependence theory to drain a wide variety of plus factors of their probative value. And courts sometimes disparage expert testimony that explains why the proffered plus factors point to collusion. Ultimately, courts have imposed heightened evidentiary burdens to prove price-fixing claims in oligopoly markets without providing any guidance on how to satisfy these heightened burdens.

Part III demonstrates that—despite what interdependence theory predicts—firms in concentrated markets still need to conspire to fix prices. An explicit conspiracy has many advantages over relying on interdependence: prices can be more easily fixed, negotiated, and renegotiated with actual conversations among rival firms; cartels can create enforcement mechanisms, which interdependence lacks; and actual conspirators can avoid miscommunications, which can destabilize price-

[4] See Louis Kaplow, Competition Policy and Price Fixing 133–45 (2013); see also William H. Page, Pleading, Discovery, and Proof of Sherman Act Agreements: Harmonizing *Twombly* and *Matsushita*, 82 Antitrust L.J. 123, 130 & n.36 (2018) (describing Kaplow's "paradox of proof").

raising aspirations based on interdependence. Empirical evidence shows unquestionably that firms in concentrated markets do, in fact, conspire to fix prices.

Part IV discusses how federal courts misapprehend the relationship between interdependence theory and plus factors. Interdependence theory does not negate plus factors; plus factors *disprove* interdependence theory. Plus factors help judges and juries "distinguish between innocent interdependence and illegal conspiracy."[5] The fact that defendants are in a concentrated market represents an important plus factor because concentrated markets facilitate price-fixing collusion. But this evidence must be supplemented by other plus factors. More effort should be undertaken to educate federal judges about how price-fixing conspiracies actually operate. This would reduce the risk of courts invoking interdependence theory to discount plus factors, especially those that are unrelated to market concentration.

I. PROVING COLLUSION THROUGH CIRCUMSTANTIAL EVIDENCE

Section One of the Sherman Act[6] condemns agreements that unreasonably restrain competition. Although the statute reaches a wide range of different trade restraints, agreements among competitors to fix prices are the quintessential antitrust violation.[7] Price-fixing conspiracies are per se illegal, which means that they are deemed unreasonably anticompetitive as a matter of law.[8] Because price-fixing defendants cannot argue that their conspiracy was justified by procompetitive justifications,[9] liability turns on whether the plaintiff can prove that the defendants agreed to fix prices. If so, the defendants have violated antitrust law.

The consequences of price-fixing liability are steep. Price fixing is criminal, convicted individuals face prison terms up to ten years, and

[5] Blomkest Fertilizer, Inc. v. Potash Corp. of Sask., 203 F.3d 1028, 1043 (8th Cir. 2000) (en banc) (Gibson, J., dissenting).

[6] 15 U.S.C. § 1.

[7] United States v. Aiyer, 33 F.4th 97, 125 n.24 (2d Cir. 2022) (noting that "price fixing . . . has consistently been held to be the quintessential *per se* violation under the Sherman Act").

[8] Christopher R. Leslie, Disapproval of Quick-Look Approval: Antitrust After *NCAA v. Alston*, 100 Wash. U. L. Rev. 1, 5 (2022) (collecting examples).

[9] St. Bernard Gen. Hosp., Inc. v. Hosp. Serv. Ass'n of New Orleans, Inc., 712 F.2d 978, 986 (5th Cir. 1983) (explaining the Supreme Court's position that "pro-competitive justifications are no defense to per se price fixing violations").

convicted corporations face exorbitant criminal fines.[10] In private antitrust litigation, because consumers who paid inflated fixed prices receive treble damages for the overcharges they paid, damages can reach nine or ten figures.[11] This panoply of private and criminal penalties ensures that price-fixing conspirators generally take extraordinary measures to ensure that they are not caught.[12]

Price-fixing claims are difficult to prove because price fixers cloak their collusion. These concealment measures include such tactics as using aliases and code names, holding secret assignations in out-of-the-way locations, fashioning fake trade associations to justify why rivals are in the same location, using encrypted email, destroying any paper trail that could expose the conspiracy, developing cover stories to explain price increases or other suspicious activity, and fabricating exculpatory documents, all while lying to government officials and customers.[13] These concealment methods can make it exceedingly difficult for the victims of price-fixing conspiracies to prove collusion.[14] And these methods usually succeed: most price-fixing conspiracies operate undetected.[15]

A. Plus Factor Analysis

Although price-fixing concealment measures mean that direct evidence of the illegal activity is rarely available,[16] private plaintiffs can use circumstantial evidence to prove price-fixing conspiracies.[17] This generally entails a two-step evidentiary process. Initially, the plaintiffs demonstrate that the defendants acted in parallel, generally raising their prices concurrently in similar amounts. Courts refer to this as "conscious

[10] 15 U.S.C. § 1.

[11] Id. § 15(a); see In re Treasury Sec. Auction Antitrust Litig., No. 15-md-02673, 2017 WL 10991411, at *2 (S.D.N.Y. Aug. 23, 2017).

[12] Christopher R. Leslie, How to Hide a Price-Fixing Conspiracy: Denial, Deception, and Destruction of Evidence, 2021 U. Ill. L. Rev. 1199, 1205–34.

[13] Id.

[14] Christopher R. Leslie, The Decline and Fall of Circumstantial Evidence in Antitrust Law, 69 Am. U. L. Rev. 1713, 1720–24 (2020).

[15] Kaplow, supra note 4, at 251 n.37 (collecting studies that estimate only approximately ten percent of price-fixing conspiracies are investigated or prosecuted).

[16] Am. Chiropractic Ass'n v. Trigon Healthcare, Inc., 367 F.3d 212, 226 (4th Cir. 2004) ("Direct evidence is extremely rare in antitrust cases and is usually referred to as the 'smoking gun.'" (quoting InterVest, Inc. v. Bloomberg, L.P., 340 F.3d 144, 159 (3d Cir. 2003))).

[17] In re Text Messaging Antitrust Litig., 630 F.3d 622, 629 (7th Cir. 2010) ("Direct evidence of conspiracy is not a sine qua non, however. Circumstantial evidence can establish an antitrust conspiracy." (citations omitted)).

parallelism," which is not enough to show an agreement to fix prices[18] because prices may be moving in unison due to interdependence.[19] Interdependence describes how firms make their business decisions—such as how much output to produce and what price to charge—based on their predictions of how their rivals will respond.[20] Interdependent decision-making does not constitute collusion so long as each decision-maker acts independently, without discussion or coordination.[21] Courts have explained that "[i]nterdependence may sometimes result in conscious parallelism, in which the firms engage in the same behavior because they consider the actions of their competitors, but not because they have overtly agreed to engage in that behavior. . . . Consciously parallel conduct does not violate antitrust laws."[22]

Because market prices can increase without a conspiracy, plaintiffs must also present evidence of "plus factors," which is circumstantial evidence that the parallel price increases are actually the product of collusion, not independent—or interdependent—decision-making.[23] Plus factors operate as "'proxies for direct evidence' because they 'tend[] to ensure that courts punish concerted action—an actual agreement.'"[24] A bundle of plus factors "when viewed in conjunction with the parallel acts, can serve to allow a fact-finder to infer a conspiracy."[25] Plus factors provide the foundation of a circumstantial price-fixing case.

[18] Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 227 (1993); In re Domestic Drywall Antitrust Litig., 163 F. Supp. 3d 175, 190 (E.D. Pa. 2016) ("Consciously parallel conduct does not violate antitrust laws.").

[19] City of Moundridge v. Exxon Mobil Corp., 429 F. Supp. 2d 117, 131–32 (D.D.C. 2006) ("Even in a concentrated market, the occurrence of a price increase does not in itself permit a rational inference of conscious parallelism or supracompetitive pricing." (quoting *Brooke Grp.*, 509 U.S. at 237)).

[20] *In re Domestic Drywall*, 163 F. Supp. 3d at 189–90 ("Interdependence is the market state in which market participants' decisions depend on what the participants[] believe their competitors will do or their observations of competitors' behavior.").

[21] In re Polyurethane Foam Antitrust Litig., 152 F. Supp. 3d 968, 976–77 (N.D. Ohio 2015) ("Because of their mutual awareness, oligopolists' decisions may be interdependent although arrived at independently.").

[22] *In re Domestic Drywall*, 163 F. Supp. 3d at 190 (citing In re Flat Glass Antitrust Litig., 385 F.3d 350, 359 (3d Cir. 2004)).

[23] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 193 (3d Cir. 2017).

[24] In re Chocolate Confectionary Antitrust Litig., 801 F.3d 383, 398 (3d Cir. 2015) (alteration in original) (quoting *In re Flat Glass*, 385 F.3d at 360).

[25] Apex Oil Co. v. DiMauro, 822 F.2d 246, 253 (2d Cir. 1987).

The Supreme Court has instructed judges to assess plus factors holistically and not in isolation.[26] Different plus factors serve different functions. Some plus factors show that the market at issue is susceptible to cartelization, while other plus factors provide evidence of cartel formation, management, and enforcement.[27] Across hundreds of antitrust opinions, courts have recognized dozens of individual plus factors.[28] But no individual opinion has documented a comprehensive list of plus factors.[29] Antitrust law does not use a balancing test in which courts weigh those plus factors that are present against those that are absent.[30] Instead, antitrust plaintiffs simply plead and proffer evidence for those plus factors that they believe are present. When plaintiffs tender a sufficient bundle of plus factors that would allow a reasonable jury to infer that the defendants conspired to fix price, the defendants' inevitable motion for summary judgment should be denied, and a jury should decide the case.[31]

B. Market Concentration as a Plus Factor

Different plus factors are probative of collusion for different reasons. Several plus factors demonstrate that the defendants' market or the products they sell are particularly susceptive to cartelization.[32] For example, market concentration, markets with high barriers to entry, homogeneous products, and products with inelastic demand are all independent plus factors related to cartel susceptibility.[33] The most

[26] Cont'l Ore Co. v. Union Carbide & Carbon Corp., 370 U.S. 690, 699 (1962); In re Domestic Airline Travel Antitrust Litig., 221 F. Supp. 3d 46, 58 (D.D.C. 2016) ("'Plus factors' must be evaluated holistically." (citations omitted)); In re Currency Conversion Fee Antitrust Litig., 773 F. Supp. 2d 351, 370–71 (S.D.N.Y. 2011) ("Plaintiffs' conspiracy allegations must be examined holistically.").

[27] Christopher R. Leslie, The Probative Synergy of Plus Factors in Price-Fixing Litigation, 115 Nw. U. L. Rev. 1581, 1588–1619 (2021).

[28] See id. (summarizing and categorizing plus factors).

[29] *In re Flat Glass*, 385 F.3d at 360; In re Crop Inputs Antitrust Litig., 749 F. Supp. 3d 992, 1005 (E.D. Mo. 2024)In re Crop Inputs Antitrust Litig., No. 21-md-02993, 2024 WL 4188654, at *7 (E.D. Mo. Sept. 13, 2024) ("There is no finite list of plus factors . . . .").

[30] Christopher R. Leslie, The Factor/Element Distinction in Antitrust Litigation, 64 Wm. & Mary L. Rev. 585, 597 (2023).

[31] See Rossi v. Standard Roofing, Inc., 156 F.3d 452, 466 (3d Cir. 1998).

[32] In re Text Messaging Antitrust Litig., 630 F.3d 622, 627–28 (7th Cir. 2010) ("[A]n industry structure that facilitates collusion constitutes supporting evidence of collusion.").

[33] Leslie, supra note 27, at 1593 ("Market structure, however, is not a single plus factor but rather a set of separate plus factors, including market concentration, entry barriers, inelastic demand, absence of substitutes, and product homogeneity."); see infra notes 99–169 and accompanying text (explaining why these are plus factors).

important plus factor showing cartel susceptibility is market concentration.

Markets with relatively few firms are more likely to succumb to price-fixing conspiracies for several reasons. First, market concentration facilitates cartel coordination.[34] Price fixers must negotiate and agree upon a fixed price or range of prices, which may include specific prices or a method of calculating prices, as well as how to divide the cartel's profits.[35] Different firms often face different cost structures and, therefore, have different profit-maximizing prices.[36] A larger number of firms face greater difficulties agreeing upon a single fixed price.[37] The smaller the number of decision-makers, the easier it should be to fix prices.[38] Conspiracies with fewer firms can more easily negotiate terms.[39] And with fewer conspirators at the table, there are likely to be fewer conflicts or holdouts.[40] The U.S. Court of Appeals for the Seventh Circuit has explained that "if a small number of competitors dominates a market, they will find it safer and easier to fix prices than if there are many competitors of more or less equal size. For the fewer the conspirators, the lower the cost of negotiation."[41] In a concentrated market, communication

[34] Gainesville Utils. Dep't v. Fla. Power & Light Co., 573 F.2d 292, 303 (5th Cir. 1978) ("Economists recognize that when a market is concentrated it is easier to coordinate collusive behavior.").

[35] Herbert Hovenkamp & Christopher R. Leslie, The Firm as Cartel Manager, 64 Vand. L. Rev. 813, 825–34 (2011).

[36] J. Fred Weston & Stanley I. Ornstein, Efficiency Considerations in Joint Ventures, 53 Antitrust L.J. 85, 91 (1984) (quoting General Motors Corp. and Toyota Motor Corp., 48 Fed. Reg. 57314, 57316 (proposed Dec. 29, 1983) (to be codified at 16 C.F.R. pt. 13) (statement of Chairman Miller and Commissioners Douglas and Calvani)).

[37] Kaplow, supra note 4, at 289 ("When the number of firms is larger, coordinating on a common price . . . tends to be more difficult . . . .").

[38] In re Interior Molded Doors Antitrust Litig., Nos. 18-cv-00718, 18-cv-00850, 2019 WL 4478734, at *6 (E.D. Va. Sept. 18, 2019) ("In highly concentrated markets, fewer minds must meet to control the market.").

[39] *Gainesville Utils. Dep't*, 573 F.2d at 303 ("Economists recognize that when a market is concentrated it is easier to coordinate collusive behavior."); see Christopher R. Leslie, Trust, Distrust, and Antitrust, 82 Tex. L. Rev. 515, 564–65 (2004); see also Michal S. Gal, Algorithms as Illegal Agreements, 34 Berkeley Tech. L.J. 67, 75 (2019) ("A concentrated market structure, where a small number of competitors are protected by high entry barriers, is a condition strongly conducive to coordination. This is because reaching an agreement to limit competition is easier and less costly if the number of firms involved is small.").

[40] Leslie, supra note 30, at 599–600 ("Fewer negotiators means fewer conflicts and a lower likelihood that a firm will unreasonably hold out for more than its fair share of cartel revenues.").

[41] In re Text Messaging Antitrust Litig., 782 F.3d 867, 871 (7th Cir. 2015). The court also noted, however, "that the fewer the firms, the easier it is for them to engage in 'follow the

is more efficient, and price fixing may require fewer meetings and messages.[42]

Second, successful price fixing requires concealment. If the conspiracy is discovered, federal officials may prosecute, and consumers may sue for treble damages. Rational firms will not conspire to fix prices unless they believe that they will avoid detection; otherwise, price fixing is not sensible. Concentrated market structures are conducive to concealment for several reasons. Because coordination is easier, there are fewer inter-seller communications that could accidentally expose the conspiracy.[43] A concentrated market also means that there are fewer people who know about the cartel, and therefore fewer people who may panic and expose the conspiracy to authorities in exchange for leniency.[44] Oligopolists can be more confident that none of their coconspirators will defect. Furthermore, price-fixing cartels with more conspirators are more likely to have to write down their agreement, which increases the probability of outside detection.[45] In sum, because firms in a concentrated market are better able to conceal their illegal activity, they are more likely to engage in it.

Third, concentrated markets magnify the incentive for firms to conspire. The expected rewards for price fixing need to be big enough to justify risking antitrust penalties.[46] The relative monetary incentives to fix

leader' pricing ('conscious parallelism,' as lawyers call it, 'tacit collusion' as economists prefer to call it)—which means coordinating their pricing without an actual agreement to do so." Id.

[42] Herbert Hovenkamp, The Antitrust Enterprise: Principle and Execution 127 (2005) ("Furthermore, the structure of the market may enable firms to reach an understanding on the basis of far less communication than they would need in a more competitively structured market.").

[43] See In re High Fructose Corn Syrup Antitrust Litig., 295 F.3d 651, 656 (7th Cir. 2002) (noting that in the high fructose corn syrup market, which had five major players, "elaborate communications, quick to be detected, would not have been necessary to enable pricing to be coordinated"); Kaplow, supra note 4, at 305 ("[W]hen the number of firms is small—explicit interfirm communications may be less essential and also more difficult to detect.").

[44] See generally Christopher R. Leslie, Cartels, Agency Costs, and Finding Virtue in Faithless Agents, 49 Wm. & Mary L. Rev. 1621 (2008) (discussing the role of employees exposing cartels in exchange for leniency).

[45] Gainesville Utils. Dep't v. Fla. Power & Light Co., 573 F.2d 292, 303 (5th Cir. 1978) ("To establish a market division among fifty firms, for example, a written document may be necessary. But when only two companies dominate a market, it is unlikely any formal agreement is needed or would be risked.").

[46] In addition to the sheer size of antitrust penalties, any individual firm can be legally responsible for all the cartel overcharges, trebled, with no right to contribution from any coconspirators. Christopher R. Leslie, Judgment-Sharing Agreements, 58 Duke L.J. 747, 753–

prices skew positively to encourage collusion in concentrated markets because cartel profits are higher[47] and are divided among a smaller number of conspirators. In an unconcentrated market, firms necessarily receive a smaller percentage of the overall profits.[48] This makes price fixing less attractive and, thus, less likely in unconcentrated markets.[49]

Given these dynamics, cheating on an established cartel is more attractive when one's share of the cartel profits is lower. In unconcentrated markets, the expected gains from cheating on the cartel—relative to the expected cartel profits—are greater. For example, in a market with twenty firms with equal market shares, a firm can receive five percent of the cartel profits by honoring the cartel agreement.[50] But cheating would allow the firm to receive a significantly greater percentage of the cartel overcharges.[51] Economists have explained that "[t]he larger the number of rival firms the larger is the profit to be expected from defection and the greater therefore the incentive to cheat."[52] But if firms recognize that their cartel partners are more likely to cheat on the cartel agreement, then their expected profits from cartelization are necessarily diminished. A rational firm is less likely to risk committing the felony of price fixing when the expected gains are lower as they are in unconcentrated markets.

Fourth, concentrated markets facilitate cartel enforcement. Because each member of any cartel can maximize its short-term profits by stealing

54 (2009) (citing Tex. Indus., Inc. v. Radcliff Materials, Inc., 451 U.S. 630, 646 (1981)). So, the risk of liability can dwarf the expected gains from collusion.

[47] See infra note 285 and accompanying text.

[48] Org. for Econ. Coop. & Dev., Algorithms and Collusion: Competition Policy in the Digital Age § 4.2.1, at 20–21 (2017), https://web-archive.oecd.org/2019-02-17/449397-Algorithms-and-colllusion-competition-policy-in-the-digital-age.pdf [https://perma.cc/92HT-2D3Y] ("A large number of firms not only makes it harder to identify a 'focal point' for co-ordination, but it also reduces the incentives for collusion as each player would receive a smaller share of the supra-competitive gains that an explicit or tacit collusive arrangement would be able to extract.").

[49] See F.T. Dolbear et al., Collusion in Oligopoly: An Experiment on the Effect of Numbers and Information, 82 Q.J. Econ. 240, 243 (1968) ("In order to achieve cooperation all firms in an industry must realize that collusion is possible and be willing to take the risk inherent in attempting to collude. As the number of firms in a market increases, . . . the profit opportunities of each are changed; this is an effect on reward structure.").

[50] This assumes no other firm in the cartel is cheating.

[51] Switgard Feuerstein, Collusion in Industrial Economics—A Survey, 5 J. Indus. Competition & Trade 163, 168 (2005) ("[A] firm earns its share of the monopoly profits, and if it[] deviates by lowering its price slightly, it will capture the whole market, and the gain from cheating will be the larger, the more firms exist.").

[52] Manfred Neumann, Competition Policy: History, Theory and Practice 70 (2001).

sales from its cartel partners, many cartel managers construct mechanisms to detect and to penalize cheating on the price-fixing agreement. Concentrated markets simplify both prongs of cartel enforcement. Detecting cheating is easier when a conspiracy has fewer members.[53] Thus, price fixers in oligopoly markets should be less likely to cheat.[54] In contrast, a firm may be more likely to cheat if it is one of dozens of cartel members and is, thus, less likely to get caught cheating by its cartel partners.[55]

Moreover, cartels in concentrated markets can respond more efficiently to cheating when detected. For example, some cartel managers require firms that sold more than their cartel allotment to purchase product from their cartel partners who sold less than their cartel allotments.[56] Courts may not recognize an inter-competitor sale as a cartel enforcement mechanism when it involves just two firms.[57] But if several firms in a market were consistently—quarterly or annually—engaging in inter-competitor sales that effectively stabilized market shares over time, it would be a clear indication that a price-fixing conspiracy was controlling the market. Price-fixing firms in oligopoly markets are less likely to need "elaborate [enforcement] mechanisms . . . that could not escape discovery by the antitrust authorities."[58] In sum, because cartel enforcement is easier with fewer firms, concentrated markets are more conducive to price-fixing conspiracies.[59]

[53] See In re Interior Molded Doors Antitrust Litig., Nos. 18-cv-00718, 18-cv-00850, 2019 WL 4478734, at *6 (E.D. Va. Sept. 18, 2019) ("Because JELD-WEN and Masonite control 85 percent of the market, each firm can easily detect 'cheating' simply by observing the other firm's behavior—enabling them to carry out a conspiracy without creating any 'smoking gun' evidence."); Gal, supra note 39, at 75 ("With fewer firms to be checked for deviating conduct, detection of cheating is also easier.").

[54] See In re High Fructose Corn Syrup Antitrust Litig., 295 F.3d 651, 656 (7th Cir. 2002) ("And if one seller broke ranks, the others would quickly discover the fact, and so the seller would have gained little from cheating on his coconspirators; the threat of such discovery tends to shore up a cartel.").

[55] Kaplow, supra note 4, at 289 ("When the number of firms is larger, coordinating on a common price and punishment strategy tends to be more difficult, and cheating may be harder to detect because there will be smaller firms whose defection may be more difficult to identify.").

[56] Christopher R. Leslie, Balancing the Conspiracy's Books: Inter-Competitor Sales and Price-Fixing Cartels, 96 Wash. U. L. Rev. 1, 14 (2018).

[57] See id. at 4, 27–36 (critiquing the Third Circuit's opinion in *Valspar Corp. v. E.I. du Pont de Nemours & Co.*, 873 F.3d 185 (3d Cir. 2017)).

[58] In re Text Messaging Antitrust Litig., 630 F.3d 622, 628 (7th Cir. 2010).

[59] See In re Blood Reagents Antitrust Litig., 266 F. Supp. 3d 750, 772 (E.D. Pa. 2017) ("[I]n a highly concentrated market[,] . . . it is also easier for firms to monitor the actions of co-

For all these reasons, price-fixing cartels in concentrated markets are more stable and, thus, more likely.[60] Because conspiracies are easier to form, easier to coordinate, easier to conceal, and easier to enforce in concentrated markets,[61] courts have historically treated market concentration as a plus factor.[62] For example, federal courts recognize that "[g]enerally speaking, the possibility of anticompetitive collusive practices is most realistic in concentrated industries."[63] Ultimately, price-fixing conspiracy claims are the most plausible in concentrated markets.[64]

conspirators and maintain pricing discipline." (citing *In re High Fructose Corn Syrup*, 295 F.3d at 656)).

[60] Cf. Henry L. King, Inferring a Price-Fixing Conspiracy, 46 Antitrust L.J. 455, 456–57 (1977) ("Very simply, the more firms that have to be included in an agreement the harder it is to negotiate, the greater the chance that negotiation will be detected, and the more likely the understanding achieved will be dissolved through price cutting or simple misunderstanding.").

[61] Cf. Walter Adams & James W. Brock, The Bigness Complex: Industry, Labor, and Government in the American Economy 118 (Stanford Univ. Press 2d ed. 2004) ("When numbers are large, conspiracies are difficult to organize, difficult to conceal, and difficult to enforce."); Feuerstein, supra note 51, at 168 ("Another important factor is the number of firms. As the number of suppliers increases, attaining a collusive agreement becomes more difficult. This seems to be particularly relevant as agreements are illegal and therefore have to be kept secret or are indeed completely tacit.").

[62] See, e.g., Todd v. Exxon Corp., 275 F.3d 191, 208 (2d Cir. 2001) ("Generally speaking, the possibility of anticompetitive collusive practices is most realistic in concentrated industries."); JSW Steel (USA) Inc. v. Nucor Corp., 586 F. Supp. 3d 585, 596 (S.D. Tex. 2022) ("While there is no exhaustive or finite list of plus factors, some recognized plus factors include: . . . market concentration and structure conducive to collusion . . . ." (citing In re Flat Glass Antitrust Litig., 385 F.3d 350, 361 (3d Cir. 2004))), *aff'd per curiam*, No. 22-20149, 2025 WL 832801 (5th Cir. Mar. 17, 2025); In re Pork Antitrust Litig., 495 F. Supp. 3d 753, 768 (D. Minn. 2020) (listing "market concentration" as a plus factor); *In re Blood Reagents*, 266 F. Supp. 3d at 772 ("Markets with only two firms . . . are highly concentrated and are conducive to collusion."); In re Propranolol Antitrust Litig., 249 F. Supp. 3d 712, 716 (S.D.N.Y. 2017) ("Economic factors make the Propranolol market susceptible to collusion, including industry concentration . . . ."); In re Titanium Dioxide Antitrust Litig., 959 F. Supp. 2d 799, 822 (D. Md. 2013) ("Indicators that a market is conducive to collusion include . . . a concentrated market dominated by a few sellers . . . ."); In re Pool Prods. Distrib. Mkt. Antitrust Litig., 988 F. Supp. 2d 696, 711 (E.D. La. 2013) ("Plus factors identified by courts and commentators include . . . market concentration and structure conducive to collusion . . . ."), *appeal dismissed per stipulation*, No. 16-30885 (5th Cir. Oct. 27, 2016); Park Irmat Drug Corp. v. Express Scripts Holding Co., 310 F. Supp. 3d 1002, 1013 (E.D. Mo. 2018) ("Such 'plus factors' may include . . . market concentration . . . ." (quoting Minn. Ass'n of Nurse Anesthetists v. Unity Hosp., 5 F. Supp. 2d 694, 704 (D. Minn. 1998))), *aff'd*, 911 F.3d 505 (8th Cir. 2018); AMC Ent. Holdings, Inc. v. IPIC-Gold Class Ent., LLC, 638 S.W.3d 198, 213 (Tex. 2022) (listing "market concentration and structure conducive to collusion" as a plus factor (quoting *In re Pool Prods. Distrib. Mkt.*, 988 F. Supp. 2d at 711)).

[63] *Todd*, 275 F.3d at 208.

[64] Litovich v. Bank of Am. Corp., 568 F. Supp. 3d 398, 430 (S.D.N.Y. 2021) ("The fewer the number of participants in the market the easier to reach an agreement to restrain trade and

II. THE ROLE OF INTERDEPENDENCE THEORY IN PRICE-FIXING LITIGATION

Because parallel price increases may be the consequence of conscious parallelism, courts require antitrust plaintiffs without direct evidence of price fixing to present evidence of plus factors. This Part explains how federal courts have converted interdependence theory into an almost insurmountable barrier for antitrust plaintiffs. In doing so, these courts have improperly discounted factual evidence of collusion.

A. The Interdependence Assumption in Antitrust

Interdependence theory holds that firms in a concentrated market can individually raise their prices in a way that mimics price fixing. Firms are interdependent if the profitability of one firm's actions depends on how other firms respond, necessitating that each firm predict its rivals' reactions and act accordingly.[65] In an unconcentrated market, no single firm's decisions can meaningfully affect market price or market output.[66] Each firm is a price taker, meaning each firm treats the market price as a given and decides its output based on that particular market price.[67] In contrast, in concentrated markets, each firm's decisions regarding price and output "will have a noticeable impact on the market and on its rivals."[68] Oligopolists influence each other's decisions in ways that competitive firms do not.[69] Thus, a firm in an oligopoly market may be

the easier to enforce such an agreement, thus the more plausible the inference of conspiracy." (citations omitted)), *vacated*, 106 F.4th 218 (2d Cir. 2024).

[65] See Rsrv. Supply Corp. v. Owens-Corning Fiberglas Corp., 971 F.2d 37, 50 (7th Cir. 1992) ("One firm could not maintain higher prices than another without facing a loss in sales.").

[66] In re Chocolate Confectionary Antitrust Litig., 801 F.3d 383, 397 (3d Cir. 2015) ("In competitive markets, the theory goes, any one firm's change in output or price would go unnoticed by its competitors because the effects of that firm's increased sales 'would be so diffused among its numerous competitors.'" (quoting *In re Flat Glass*, 385 F.3d at 359)).

[67] See *In re Flat Glass*, 385 F.3d at 359 ("The theory of interdependence posits the following: In a market with many firms, the effects of any single firm's price and output decisions 'would be so diffused among its numerous competitors that they would not be aware of any change.'" (quoting 6 Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶ 1429, at 206 (2d ed. 2000))).

[68] Id. (quoting 6 Areeda & Hovenkamp, supra note 67, ¶ 1429, at 206); see also *In re Chocolate Confectionary*, 801 F.3d at 397 ("[T]he theory of interdependence posits that 'any rational decision [by an oligopolist] must take into account the anticipated reaction of the other firms.'" (alteration in original) (quoting *In re Flat Glass*, 385 F.3d at 359)).

[69] See Lifewatch Servs. Inc. v. Highmark Inc., 902 F.3d 323, 333 (3d Cir. 2018) ("In cases involving concentrated markets like oligopolies or oligopsonies—where a small number of

concerned that if it lowers its prices to lure new customers, its rivals will match the new lower price, and the profits of all firms will decline. This disincentivizes firms from lowering their prices in concentrated markets.[70]

In some markets, interdependent behavior can create a stable equilibrium at higher prices without an agreement to fix prices.[71] In theory, interdependence allows rival "firms in a concentrated market [to] maintain their prices at supracompetitive levels, or even raise them to those levels, without engaging in any overt concerted action."[72] Depending on the industry, oligopolistic interdependence can have the same effects as explicit price fixing.[73] How closely interdependence approximates collusion depends on several factors, including the number of firms, the nature of the product, and the firms' relative cost structures, among other variables.[74]

Interdependence sometimes takes the form of a follow-the-leader strategy. Firms in a concentrated market may independently realize they can maximize their profits by copying any rival that raises its prices.[75] The First Circuit has explained that each firm may "reach its own independent conclusion that its best interests involve keeping prices high, including following price changes by a price 'leader' (if one emerges), in confidence that the other [competitors] will reach the same independent

sellers or buyers of a particular product dominate the market—we have recognized that competitors are more likely to be influenced by each other's behavior even without agreeing to act in concert.").

[70] Id. ("[O]ne oligopolist may refrain from lowering its price because it fears, indeed knows, that its rivals will match it." (quoting Phillip E. Areeda & Herbert Hovenkamp, Fundamentals of Antitrust Law § 14.10[G] n.24 (Wolters Kluwer 4th ed. Supp. 2017))).

[71] Ariel Ezrachi & Maurice E. Stucke, Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy 59 (2016) ("Importantly, the owners could charge high prices without any formal or informal illegal agreement among themselves. The equilibrium was the result of a rational, unilateral decision by each competitor.").

[72] In re Cal. Bail Bond Antitrust Litig., 511 F. Supp. 3d 1031, 1046 (N.D. Cal. 2021) (quoting *In re Flat Glass*, 385 F.3d at 359).

[73] See Adams & Brock, supra note 61, at 119 ("Undoubtedly the degree to which oligopolistic interdependence approximates perfect collusion varies from industry to industry and situation to situation. . . . But there can be no doubt that rational firm behavior under oligopoly militates toward tacit collusion . . . .")

[74] Id.

[75] Kleen Prods. LLC v. Ga.-Pac. LLC, 910 F.3d 927, 935 (7th Cir. 2018) ("Each firm in a tight oligopoly might think that it will reap greater profits if it imitates, rather than undermines, its peers' price hikes." (first citing Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 227 (1993); and then citing Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 191 (3d Cir. 2017))).

conclusion."[76] Interdependence rewards and encourages the follow-the-leader strategy of increasing market prices in sync.[77] In sum, firms in oligopoly markets may charge uniform supracompetitive prices without actually agreeing with each other to do so.[78]

Although interdependent pricing may have similar market effects to collusion, it has different legal consequences. Courts have long held "that interdependent behavior is not an 'agreement' within the term's meaning under the Sherman Act."[79] Interdependence does not constitute an agreement even if firms are consciously raising their prices in parallel fashion.[80] The Third Circuit explained in *In re Chocolate Confectionary Antitrust Litigation*[81] that in concentrated markets, "[t]he upshot is oligopolists may maintain supracompetitive prices through rational, interdependent decision-making, as opposed to unlawful concerted action, if the oligopolists independently conclude that the industry as a whole would be better off by raising prices."[82] Thus, although oligopoly pricing inflicts the same harm as explicit price fixing, it is legal because there is no actual agreement among the oligopolists.[83]

[76] White v. R.M. Packer Co., 635 F.3d 571, 579 (1st Cir. 2011).

[77] Ezrachi & Stucke, supra note 71, at 59 ("This discovered interdependence not only reduces the incentive to discount; it increases their incentive to follow a price increase.").

[78] In re Polyurethane Foam Antitrust Litig., 152 F. Supp. 3d 968, 976 (N.D. Ohio 2015) ("[T]he 'theory of interdependence' in such markets holds that oligopolists may engage in parallel pricing behavior—even price at supracompetitive levels—without an express or tacit price-fixing agreement." (quoting In re Flat Glass Antitrust Litig., 385 F.3d 350, 359 (3d Cir. 2004) (internal quotation marks omitted))).

[79] *In re Flat Glass*, 385 F.3d at 360; see, e.g., United States v. Int'l Harvester Co., 274 U.S. 693, 708–09 (1927) ("[T]he fact that competitors may see proper, in the exercise of their own judgment, to follow the prices of another manufacturer, does not establish any suppression of competition or show any sinister domination."); Rebel Oil Co. v. Atl. Richfield Co., 51 F.3d 1421, 1442 (9th Cir. 1995) (" 'The fact that competitors may see proper . . . to follow the prices of another manufacturer' . . . does not violate the Sherman Act." (quoting In re Coordinated Pretrial Proc. in Petroleum Prods. Antitrust Litig., 906 F.2d 432, 444 (9th Cir. 1990))).

[80] See Page, supra note 4, at 133–34 ("The most important narrowing in Sherman Act cases, of course, is the exclusion of 'mere interdependence' from the definition of agreement.").

[81] 801 F.3d 383 (3d Cir. 2015).

[82] Id. at 397.

[83] Blomkest Fertilizer v. Potash Corp. of Sask., 203 F.3d 1028, 1042 (8th Cir. 2000) (en banc) (Gibson, J., dissenting) ("Even though oligopoly pricing harms the consumer in the same way monopoly does, interdependent pricing that occurs *with no actual agreement* does not violate the Sherman Act, for the very good reason that we cannot order sellers to make their decisions without taking into account the reactions of their competitors." (citing Donald F. Turner, The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusals to Deal, 75 Harv. L. Rev. 655, 660 (1962))).

Treating interdependent pricing as non-collusive makes sense because it would be impractical and counterproductive to attempt to impose an antitrust remedy that forbids firms from considering their rivals' prices. As then-Judge Stephen Breyer explained in a First Circuit opinion, interdependent pricing falls outside of Section One "not because such pricing is desirable (it is not), but because it is close to impossible to devise a judicially enforceable remedy for 'interdependent' pricing. How does one order a firm to set its prices *without regard* to the likely reactions of its competitors?"[84] Thus, as a matter of both text and policy, interdependent but independent conduct is not conspiratorial and does not violate Section One of the Sherman Act.

Price-fixing defendants sometimes ask courts to discount price parallelism as mere interdependence. In *In re Polyurethane Foam Antitrust Litigation*,[85] for example, the defendants argued that "any observed parallelism [in the market] is a natural, lawful feature of an oligopolistic industry, one in which price decisions depend on supply and demand factors, as well as strategic considerations of competitors' likely pricing decisions."[86] Courts sometimes accept the defendants' invitation and excuse price leadership when it occurs in an oligopolistic market. For example, the district judge in *In re Domestic Drywall Antitrust Litigation*[87] opined that, in deciding whether defendants illegally conspired to fix prices, "the Court must not rely on mere price followership activity because price followership is expected in oligopolistic markets."[88] Perhaps because the Supreme Court has described interdependent pricing as "common,"[89] some courts seem to assume that firms in oligopolistic markets are likely to behave interdependently.[90]

[84] Clamp-All Corp. v. Cast Iron Soil Pipe Inst., 851 F.2d 478, 484 (1st Cir. 1988) (citing 6 Areeda & Hovenkamp, supra note 2, ¶ 1432–33, at 241, 263).

[85] 152 F. Supp. 3d 968 (N.D. Ohio 2015).

[86] Id. at 981.

[87] 163 F. Supp. 3d 175 (E.D. Pa. 2016).

[88] Id. at 231.

[89] Bell Atl. Corp. v. Twombly, 550 U.S. 544, 553–54 (2007) ("'[C]onscious parallelism[]' [is] a common reaction of 'firms in a concentrated market [that] recogniz[e] their shared economic interests and their interdependence with respect to price and output decisions' . . . ." (fourth and fifth alterations in original) (quoting Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 227 (1993))).

[90] See, e.g., *In re Domestic Drywall*, 163 F. Supp. 3d at 189–90 ("Oligopolistic markets tend to be interdependent because competitors are more likely to consider each other's actions in markets dominated by few sellers. Thus, though each firm in an oligopoly 'may independently

Driving judicial thinking is the assumption that oligopolies render interdependent pricing unavoidable.[91] Courts assume that firms in oligopoly markets *necessarily* behave interdependently.[92] For example, the Eleventh Circuit has claimed that "[t]he hallmark of an oligopoly is tacit collusion among competitors."[93] Interdependent pricing is seen as natural, if not inevitable. The Third Circuit has asserted that "in an oligopolistic market, parallel behavior 'can be a necessary fact of life.'"[94] Judges treat oligopoly pricing as natural,[95] and they expect firms to behave interdependently, reasoning that "it is generally unremarkable for the pendulum in oligopolistic markets to swing from less to more interdependent and cooperative."[96] Such reasoning turns the plus factor of market concentration on its head, transforming it from inculpatory to exculpatory.

Based on these assumptions, courts have made it harder for price-fixing plaintiffs to survive summary judgment when the defendants are oligopolists.[97] By treating parallel price increases as proof of "oligopolistic rationality," instead of as evidence of collusion, courts

decide upon its course of action, any rational decision must take into account the anticipated reaction' of the other firms." (quoting In re Baby Food Antitrust Litig., 166 F.3d 112, 122 (3d Cir. 1999))).

[91] See 6 Areeda & Hovenkamp, supra note 2, ¶ 1429, at 227 ("Oligopoly Makes Interdependent Behavior Inevitable.").

[92] See, e.g., Rebel Oil Co. v. Atl. Richfield Co., 51 F.3d 1421, 1443 (9th Cir. 1995) ("By definition, oligopolists are interdependent."); *In re Domestic Drywall*, 163 F. Supp. 3d at 189 ("Oligopolistic markets tend to be interdependent.").

[93] Bailey v. Allgas, Inc., 284 F.3d 1237, 1251 (11th Cir. 2002).

[94] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 193 (3d Cir. 2017) (quoting *In re Baby Food*, 166 F.3d at 122).

[95] In re Chocolate Confectionary Antitrust Litig., 801 F.3d 383, 398 (3d Cir. 2015) ("By nature, oligopolistic markets are conducive to price fixing and will often exhibit behavior that would not be expected in competitive markets." (citing In re Flat Glass Antitrust Litig., 385 F.3d 350, 360–61 (3d Cir. 2004))); *In re Domestic Drywall*, 163 F. Supp. 3d at 191 (quoting *In re Chocolate Confectionary*, 801 F.3d at 398); see also In re Polyurethane Foam Antitrust Litig., 152 F. Supp. 3d 968, 981 (N.D. Ohio 2015) (referencing the defendants' argument that "any observed parallelism [in the market] is a *natural*, lawful feature of an oligopolistic industry, one in which price decisions depend on supply and demand factors, as well as strategic considerations of competitors' likely pricing decisions" (emphasis added)).

[96] *Valspar*, 873 F.3d at 196 (quoting *In re Chocolate Confectionary*, 801 F.3d at 410).

[97] See, e.g., White v. R.M. Packer Co., 635 F.3d 571, 586 (1st Cir. 2011) (affirming the district court's decision to grant the defendants' motion for summary judgment and observing that "[o]ne does not need an agreement to bring about this kind of follow-the-leader effect in a concentrated industry" (quoting Clamp-All Corp. v. Cast Iron Soil Pipe Inst., 851 F.2d 478, 484 (1st Cir. 1988))).

make it much harder for plaintiffs to survive motions to dismiss and motions for summary judgment.[98]

B. How Interdependence Theory Affects the Market Concentration Plus Factor

Despite the fact that market concentration can be important circumstantial evidence to prove collusion,[99] courts have relied on interdependence theory to steadily undermine and discount market concentration as a plus factor. Interdependence theory has made some courts "cautious in accepting inferences from circumstantial evidence in cases involving allegations of horizontal price-fixing among oligopolists."[100] Judges seem to believe as a matter of law that interdependent pricing, including follow-the-leader pricing, is inherently more plausible than collusion. In dismissing price-fixing claims based on circumstantial evidence, courts have asserted that sequential announcement of price increases, "although consistent with conspiracy, is *more indicative* of consciously parallel follow-the-leader pricing."[101] For example, in an opinion affirmed by the Fourth Circuit, the district court in *Hall v. United Air Lines, Inc.*,[102] asserted that because the defendants participated in an oligopoly market, the "[p]laintiffs' purported 'structural plus factors' are unfounded under antitrust law."[103] Some federal judges have asserted that "[m]arket structure susceptible to collusion is not independently a plus factor."[104] State courts, too, have held that concentrated markets are not probative of collusion because the economics of such "marketplace[s] . . . are nothing more than inherent characteristics of an oligopoly and cannot tend to exclude independent

[98] *In re Flat Glass*, 385 F.3d at 359–60 (quoting 6 Areeda & Hovenkamp, supra note 67, ¶ 1429, at 206–07); William H. Page, Direct Evidence of a Sherman Act Agreement, 83 Antitrust L.J. 347, 350 (2020).

[99] See supra Section I.B.

[100] *In re Flat Glass*, 385 F.3d at 358–59 (citations omitted).

[101] In re Fla. Cement & Concrete Antitrust Litig., 746 F. Supp. 2d 1291, 1309–10 (S.D. Fla. 2010) (emphasis added).

[102] 296 F. Supp. 2d 652 (E.D.N.C. 2003), *aff'd sub nom*. Hall v. Am. Airlines, Inc., 118 F. App'x 680 (4th Cir. 2004).

[103] Id. at 674.

[104] Quality Auto Painting Ctr. of Roselle, Inc. v. State Farm Indem. Co., 917 F.3d 1249, 1286 (11th Cir. 2019) (Wilson, J., dissenting).

action."[105] These courts have essentially used interdependence theory to effectively eliminate market concentration as a plus factor.

In addition to discounting market concentration outright, courts also isolate this plus factor in order to deplete its probative value.[106] For example, in granting summary judgment to price-fixing defendants, the district court in *In re Chocolate Confectionary*[107] stated that "[t]he mere fact that a market may exhibit oligarchic tendencies and characteristics is, *without more*, insufficient to establish antitrust liability."[108] The statement is true on its face,[109] but the court must consider this plus factor in the context of the other plus factors presented by the plaintiff.[110] Despite this well-established rule, in affirming the district court's grant of summary judgment, the Third Circuit repeatedly isolated all other plus factors, asserting that each "alone" or "without more" did not individually prove collusion.[111] Citing interdependence theory, courts suggest that because market concentration on its own does not prove collusion, market concentration is not probative of collusion. That is wrong.[112]

[105] Romero v. Philip Morris Inc., 242 P.3d 280, 296–98 (N.M. 2010) (citing Holiday Wholesale Grocery Co. v. Philip Morris, Inc., 231 F. Supp. 2d 1253, 1305 (N.D. Ga. 2002)); see also Smith v. Philip Morris Cos., 335 P.3d 644, 669 (Kan. Ct. App. 2014) (agreeing with other courts to "reject the [highly concentrated market] structure of the cigarette market as a viable plus factor here").

[106] Leslie, supra note 27, at 1623 (noting how "courts routinely isolate evidence regarding Cartel Susceptibility"); see also Rsrv. Supply Corp. v. Owens-Corning Fiberglas Corp., 971 F.2d 37, 55 (7th Cir. 1992) ("Because of the interdependence of the fiberglass insulation industry, consciously parallel pricing *alone* does not indicate a conspiracy." (emphasis added)); In re High Fructose Corn Syrup Antitrust Litig., 156 F. Supp. 2d 1017, 1038 (C.D. Ill. 2001) ("[I]t is well established that where a market is dominated by a few major players, parallel pricing is not uncommon and is generally insufficient to prove an antitrust conspiracy."), *rev'd*, 295 F.3d. 651 (7th Cir. 2002).

[107] 999 F. Supp. 2d 777 (M.D. Pa. 2014), *aff'd*, 801 F.3d 383 (3d Cir. 2015).

[108] Id. at 790 (emphasis added).

[109] Bell Atl. Corp. v. Twombly, 550 U.S. 544, 554 (2007) (noting "[t]he inadequacy of showing parallel conduct or interdependence, without more" because it is "consistent with conspiracy, but just as much in line with a wide swath of rational and competitive business strategy").

[110] See Leslie, supra note 27, at 1638–40.

[111] See id.; infra notes 227–35 and accompanying text (discussing *In re Chocolate Confectionary*, 801 F.3d 383).

[112] Leslie, supra note 27, at 1623–28; see infra Part IV (explaining how to analyze plus factors in a concentrated market).

C. Interdependence Theory Versus Plus Factors

When proving price fixing through circumstantial evidence, plaintiffs proffer evidence of plus factors that suggest the defendants' parallel price increases were in fact caused by collusion. When markets are concentrated, however, many federal courts conflate innocent interdependence with suspicious plus factors, assuming that the former negates the latter. Some courts dealing with price-fixing claims in oligopoly markets assert that "many so-called plus factors simply 'demonstrate that a given market is chronically non-competitive,' without helping to explain whether agreement or conscious parallelism is the cause."[113] But helping to distinguish between illegal agreements and legal parallelism is exactly what plus factors do. By treating other plus factors as simply part of interdependent behavior, courts strip multiple plus factors of their probative value.[114] For example, courts use interdependence theory to discount the frequency of parallel price increases,[115] even though such frequency is its own plus factor.[116]

The remainder of this Section demonstrates how federal judges have invoked interdependence theory to discount or disregard over a dozen different plus factors. The discussion examines these plus factors in three categories: plus factors that are conflated with interdependence, plus factors related to market and product characteristics, and plus factors related to defendants' conduct.

[113] White v. R.M. Packer Co., 635 F.3d 571, 581 (1st Cir. 2011) (quoting Michael D. Blechman, Conscious Parallelism, Signalling and Facilitating Devices: The Problem of Tacit Collusion Under the Antitrust Laws, 24 N.Y.L. Sch. L. Rev. 881, 898 (1979)).

[114] See William H. Page, Tacit Agreement Under Section 1 of the Sherman Act, 81 Antitrust L.J. 593, 597 (2017) ("But most plus factors only 'restate the phenomenon of interdependence' by identifying markets in which oligopolistic coordination is possible, not those in which there is a Section 1 agreement." (quoting In re Flat Glass Antitrust Litig., 385 F.3d 350, 360 (3d Cir. 2004))).

[115] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 196 (3d Cir. 2017) (discussing cases).

[116] See In re Titanium Dioxide Antitrust Litig., 959 F. Supp. 2d 799, 825 (D. Md. 2013) ("The sheer number of parallel price increases, when coupled with the other evidence in this case, could lead a jury to reasonably infer a conspiracy."); In re Se. Milk Antitrust Litig., 555 F. Supp. 2d 934, 944 (E.D. Tenn. 2008) ("It seems . . . only logical that the more individual instances of parallel conduct alleged by the plaintiffs, the stronger the inference that can be drawn from those acts of parallel conduct to support an illegal conspiracy and the less likely it is that these parallel acts occurred unilaterally without any conspiracy or agreement.").

1. Plus Factors Conflated with Interdependence

When introducing the concept of plus factors, courts routinely describe plus factors as evidence that "tend[s] to suggest the existence of collusion, such as evidence showing: (1) a motive to conspire to fix prices; (2) the defendant 'acted contrary to its interests;' and (3) 'a traditional conspiracy.'"[117] This list is not exhaustive, but the place of prominence granted the first two items is telling. The defendants' motive to conspire and the fact that the defendants were taking actions against their independent interests are the two individual plus factors most cited by courts. Yet, despite their importance, courts use interdependence theory to nullify these plus factors.

Although courts recognize the motive to conspire as an important plus factor,[118] federal courts often discount the probative value of motive when the defendants are oligopolists. In affirming dismissal of an antitrust complaint alleging price fixing of guitars and amplifiers, the Ninth Circuit in *In re Musical Instruments & Equipment Antitrust Litigation*[119] stated that "alleging 'common motive to conspire' simply restates that a market is interdependent."[120] Similarly, in affirming dismissal of a putative class action against financial institutions accused of conspiring to restrain trade in the securities market, the Second Circuit held that "evidence that the defendant had a motive to enter into a[n antitrust] conspiracy . . . may indicate simply that the defendants operate in an oligopolistic market, that is, may simply restate the (legally insufficient) fact that market behavior is interdependent and characterized by conscious parallelism."[121] One Louisiana federal court starkly concluded: "Motivation is . . . synonymous with interdependence and therefore adds nothing to

[117] Roofer's Pension Fund v. Papa, 687 F. Supp. 3d 604, 620 (D.N.J. 2023) (quoting Lifewatch Servs. Inc. v. Highmark Inc., 902 F.3d 323, 333 (3d Cir. 2018)).

[118] See, e.g., Burtch v. Milberg Factors, Inc., 662 F.3d 212, 227 (3d Cir. 2011) (describing "evidence that the defendant had a motive to enter into a price fixing conspiracy" as a plus factor (quoting In re Ins. Brokerage Antitrust Litig., 618 F.3d 300, 321–22 (3d Cir. 2010))); Mitchael v. Intracorp, Inc., 179 F.3d 847, 858–59 (10th Cir. 1999) (noting that "motivation to enter into an agreement requiring parallel behavior" is a plus factor (quoting Monument Builders of Greater Kan. City, Inc. v. Am. Cemetery Ass'n, 891 F.2d 1473, 1481 (10th Cir. 1989))).

[119] 798 F.3d 1186 (9th Cir. 2015).

[120] Id. at 1194–95.

[121] Mayor of Balt. v. Citigroup, Inc., 709 F.3d 129, 139 (2d Cir. 2013) (alterations in original) (quoting *In re Ins. Brokerage*, 618 F.3d at 322).

it."[122] Other courts routinely concede the presence of motive to conspire but then strip the plus factor of its probative value if the market is concentrated.[123]

In addition to motive to conspire, when defendants engage in actions that would be against their independent interests absent collusion, courts treat it as a significant plus factor.[124] The Sixth Circuit has explained that "[a] showing that the defendants' actions, taken independently, would be contrary to their economic self-interest will ordinarily 'tend to exclude the likelihood of independent conduct.'"[125] Indeed, some courts have reasoned that actions against self-interest are the most important plus factor.[126]

Courts routinely use interdependence theory to undermine actions against independent interest as a plus factor despite its value as

[122] In re Pool Prods. Distrib. Mkt. Antitrust Litig., 158 F. Supp. 3d 544, 570 (E.D. La. 2016) (quoting 6 Phillip E. Areeda & Herbert Hovenkamp, Antitrust Law ¶ 1434, at 269 (3d ed. 2010)).

[123] See, e.g., In re Chocolate Confectionary Antitrust Litig., 801 F.3d 383, 398 (3d Cir. 2015) ("But evidence of motive without more does not create a reasonable inference of concerted action because it merely restates interdependence." (citing In re Flat Glass Antitrust Litig., 385 F.3d 350, 360 (3d Cir. 2004))); In re Delta/Airtran Baggage Fee Antitrust Litig., 245 F. Supp. 3d 1343, 1380 (N.D. Ga. 2017) ("[O]ther courts have similarly recognized that 'common motive does not suggest an agreement' and is not indicative of anything beyond interdependence." (quoting *In re Musical Instruments & Equip.*, 798 F.3d at 1194)), *aff'd sub nom.* Siegel v. Delta Air Lines, Inc., 714 F. App'x 986 (11th Cir. 2018); Valspar Corp. v. E.I. du Pont de Nemours & Co., 152 F. Supp. 3d 234, 242 (D. Del. 2016) ("[E]vidence of motive 'does not create a reasonable inference of concerted action because it merely restates interdependence.'" (quoting *In re Chocolate Confectionary*, 801 F.3d at 398))), *aff'd*, 873 F.3d 185 (3d Cir. 2017).

[124] Quality Auto Painting Ctr. of Roselle, Inc. v. State Farm Indem. Co., 917 F.3d 1249, 1269 (11th Cir. 2019) ("Courts have recognized a company's actions that were against its self-interest can constitute a plus factor.").

[125] Nat'l Hockey League Players Ass'n v. Plymouth Whalers Hockey Club, 419 F.3d 462, 475 (6th Cir. 2005) (quoting Re/Max Int'l, Inc. v. Realty One, Inc., 173 F.3d 995, 1009 (6th Cir. 1999)); *In re Chocolate Confectionary*, 801 F.3d at 398 ("[E]vidence of actions against self-interest means there is evidence of behavior inconsistent with a competitive market." (citing *In re Flat Glass*, 385 F.3d at 360–61)).

[126] See, e.g., In re Pool Prods. Distrib. Mkt. Antitrust Litig., 988 F. Supp. 2d 696, 711 (E.D. La. 2013) ("A plausible allegation that the parallel conduct was not in the alleged conspirators' independent self-interest absent an agreement is generally considered the most important 'plus factor.'"); Christopher R. Leslie, Hindsight Bias in Antitrust Law, 71 Vand. L. Rev. 1527, 1565 n.210 (2018) (noting that many courts consider the action-against-individual-interest plus factor to be "the most important plus factor"); 1 Julian O. von Kalinowski, Peter Sullivan & Maureen McGuirl, Antitrust Laws and Trade Regulation § 11.02[2](b) (2d ed. 2008) ("The most important plus factor is that the alleged action would have been against the self-interest of any actor who engaged in it alone . . . .").

circumstantial evidence. Some circuits have held that "[a]n action that would seem against self-interest in a competitive market may just as well reflect market interdependence giving rise to conscious parallelism."[127] While admitting "the fact that a firm's action is against its self interest could support a finding of a conspiracy," courts nevertheless often discount this plus factor when markets are concentrated, asserting that "the concept of 'action against self interest' is an ambiguous one and one of its meanings could merely constitute a restatement of interdependence."[128]

A firm's unprompted decision to unilaterally raise its price may be viewed as against its self-interest if done without an agreement because that firm would lose sales to its rivals. The Supreme Court has long recognized that parallel price increases unrelated to input costs are suspicious and constitute circumstantial evidence of collusion.[129] Writing the Seventh Circuit opinion in *In re Text Messaging Antitrust Litigation*,[130] Judge Richard Posner explained that parallel price increases when costs are declining show "anomalous behavior because falling costs increase a seller's profit margin at the existing price, motivating him, *in the absence of agreement*, to reduce his price slightly in order to take business from his competitors, and certainly not to increase his price."[131] Consequently, courts generally treat parallel price increases when costs are declining as a plus factor.[132]

[127] *In re Musical Instruments & Equip.*, 798 F.3d at 1195.

[128] Coleman v. Cannon Oil Co., 849 F. Supp. 1458, 1467 (M.D. Ala. 1993); see also *Quality Auto Painting*, 917 F.3d at 1269 ("Courts and commentators have further observed that this plus factor often restates interdependence in the context of alleged price-fixing."); Ross v. Am. Express Co., 35 F. Supp. 3d 407, 447 (S.D.N.Y. 2014) ("[T]he concept of 'action against self-interest' is ambiguous and one of its meanings could merely constitute a restatement of interdependence." (quoting In re Baby Food Antitrust Litig., 166 F.3d 112, 122 (3d Cir. 1999))), *aff'd sub nom.* Ross v. Citigroup, Inc., 630 F. App'x 79 (2d Cir. 2015), *as corrected* (Nov. 24, 2015); Christopher R. Leslie, Conspiracy to Arbitrate, 96 N.C. L. Rev. 381, 435–51 (2018) (explaining how the *Ross* decision was incorrect).

[129] See Am. Tobacco Co. v. United States, 328 U.S. 781, 804–06 (1946).

[130] 630 F.3d 622 (7th Cir. 2010).

[131] Id. at 628 (emphasis added).

[132] See, e.g., Starr v. Sony BMG Music Ent., 592 F.3d 314, 323 (2d Cir. 2010) (finding a plus factor because defendants had not decreased prices despite "dramatic cost reductions"); Est. of Le Baron v. Rohm & Haas Co., 441 F.2d 575, 578 (9th Cir. 1971) ("In *American Tobacco Co*., it was recognized that if competitors raise their prices during a period of declining costs and reap large profits as a result, and then reduce prices only when competition from others makes itself felt, that constituted probative evidence of a price-fixing conspiracy." (citing *Am. Tobacco Co*., 328 U.S. at 804–06)); City of Moundridge v. Exxon Mobil Corp.,

If a market is concentrated, however, some courts use interdependence theory to ignore unexplained parallel price increases. For example, the Third Circuit in *In re Chocolate Confectionary Antitrust Litigation* treated this noncompetitive behavior as simply restating interdependence theory because "evidence of a price increase disconnected from changes in costs or demand only raises the question: was the anticompetitive price increase the result of lawful, rational interdependence or of an unlawful price-fixing conspiracy?"[133] Answering the rhetorical question posed in *In re Chocolate Confectionary*, the Third Circuit's *Valspar Corp. v. E.I. du Pont de Nemours & Co.* opinion asserted that when price increases unrelated to cost occur in oligopolistic markets, they are "largely irrelevant because . . . 'firms in a concentrated market may maintain their prices at supracompetitive levels, or even raise them to those levels, without engaging in any overt concerted action.'"[134] The Third Circuit is not alone in diminishing the probative value of non-cost-justified parallel price increases in concentrated markets.[135]

Some courts seem to equate interdependence and actions against self-interest. In *In re Domestic Drywall Antitrust Litigation*, for example, the plaintiffs claimed that the defendants took several actions against their independent interests, which would not have occurred in a competitive market, including "announcing a 35% price increase despite a lack of meaningful increase in demand; . . . eliminating job quotes; and . . . artificially limiting supply."[136] The district judge held that although the plaintiffs "submitted sufficient evidence for a jury to conclude that all [d]efendants acted against their self-interests, . . . this finding is not sufficient, by itself, to defeat summary judgment because [p]laintiffs have not yet tended to exclude the possibility of

429 F. Supp. 2d 117, 134 (D.D.C. 2006) (discussing *American Tobacco Co.*, 328 U.S. at 805–06).

[133] 801 F.3d 383, 400 (3d Cir. 2015).

[134] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 197 (3d Cir. 2017) (quoting In re Flat Glass Antitrust Litig., 385 F.3d 350, 359 (3d Cir. 2004)).

[135] See, e.g., In re Text Messaging Antitrust Litig., 782 F.3d 867, 871–72 (7th Cir. 2015) ("Other factors mentioned in our first opinion—the small number of firms, and price increases in the face of falling costs—were conceded to be present but could not be thought dispositive."); Baker v. Jewel Food Stores, Inc., 823 N.E.2d 93, 108 (Ill. App. 2005) (rejecting a price-fixing claim in a duopoly, while noting there was "no question that defendants' milk prices did not reflect the actual cost of the various types of milk or any decreases in the cost. But . . . it is not illegal to want to make a profit").

[136] 163 F. Supp 3d 175, 252 (E.D. Pa. 2016)

interdependent conduct."[137] The court asserted that "in oligopolies, even a showing that the relevant market was ripe for collusion and that the defendants raised prices without a rise in demand or costs will usually be insufficient to rule out interdependent conduct."[138] The court treated this action against self-interest plus factor as a variant of interdependence and sapped it of its probative value because the market was concentrated.[139] This effectively eliminates actions against independent interest as a plus factor.

When addressing summary judgment motions by oligopolists, many courts strike down motive and actions against self-interest as plus factors in one fell swoop. Federal judges often assert that because of interdependence, neither plus factor is probative of collusion when the defendants operate in a concentrated market.[140] For example, after identifying "(1) evidence that the defendant had a motive to enter into a price fixing conspiracy; (2) evidence that the defendant acted contrary to its interests; and (3) evidence implying a traditional conspiracy," as plus factors, the Third Circuit in *Valspar* then asserted that "in the case of oligopolies the first two factors are deemphasized because they 'largely restate the phenomenon of interdependence.'"[141] The court denominated its approach as "a specialized rule [for] oligopolistic markets," but the rule was essentially to ignore two out of three of its articulated plus factors when the defendants are oligopolists.[142] A federal judge in the U.S.

[137] Id. at 254 (citation omitted).

[138] Id. at 190–91 (citing *In re Flat Glass*, 385 F.3d at 361).

[139] See id. at 194.

[140] See, e.g., *In re Flat Glass*, 385 F.3d at 360 ("In the context of parallel pricing, [motive and actions contrary to interests] largely restate the phenomenon of interdependence."); Superior Offshore Int'l, Inc. v. Bristow Grp., Inc., 490 F. App'x 492, 499 (3d Cir. 2012) ("[T]he . . . two 'plus factors,' motive and action contrary to self-interest, are not especially helpful in price-fixing cases where, as here, there are parallel price increases by competitors in a concentrated market."); Pharmacychecker.com, LLC v. Nat'l Ass'n of Bds. of Pharmacy, 530 F. Supp. 3d 301, 334 n.16 (S.D.N.Y. 2021) ("The Third Circuit has warned that 'the first two plus factors may indicate that defendants operate in an oligopolistic market, that is, . . . market behavior is interdependent and characterized by conscious parallelism.'" (alteration in original) (quoting Burtch v. Milberg Factors, Inc., 662 F.3d 212, 227 (3d Cir. 2011))); Pelletier v. Endo Int'l PLC, 439 F. Supp. 3d 450, 464 (E.D. Pa. 2020) ("Although all three plus factors are 'weighed together, in the case of oligopolies the first two factors are deemphasized because they "largely restate the phenomenon of interdependence."'" (quoting Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 193 (3d Cir. 2017))).

[141] *Valspar*, 873 F.3d at 193 (first quoting In re Chocolate Confectionary Antitrust Litig., 801 F.3d 383, 398 (3d Cir. 2015) (internal quotation marks omitted); and then quoting *In re Flat Glass*, 385 F.3d at 360).

[142] Id. at 196.

District Court for the Southern District of New York asserted that "[c]ourts consider these two factors (evidence that the defendant had motive and opportunity to enter a price-fixing conspiracy and evidence that the defendant acted contrary to its self-interest) irrelevant in an oligopoly case."[143] This approach is mistaken because even if motive and actions against interest are not enough to defeat price-fixing defendants' motions for summary judgment,[144] they should not be deemphasized to the point of irrelevance.[145]

2. Plus Factors Related to Market and Product Characteristics

A range of plus factors demonstrate that a defendants' product market was susceptible to cartelization. While market concentration is the most important plus factor in this category, others include that the market is protected by high barriers to entry, that the defendants sell homogeneous products, and that the consumer demand is inelastic. Courts have invoked interdependence theory to nullify each of these plus factors.

i. Barriers to Entry

Markets with high barriers to entry are more conducive to collusion because conspirators know that they can raise prices to supracompetitive levels without attracting new entrants to flood the market.[146] As a matter of both theory and empirical experience, cartelized industries tend to enjoy higher barriers to entry.[147] For these reasons, courts treat barriers to entry as a plus factor.[148]

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[143] In re Mylan N.V. Sec. Litig., 666 F. Supp. 3d 266, 320–21 (S.D.N.Y. 2023), *aff'd sub nom.* Menorah Mivtachim Ins. Ltd. v. Sheehan, No. 23-cv-00720, 2024 WL 1613907 (2d Cir. 2024).

[144] 6 Areeda & Hovenkamp, supra note 2, ¶ 1434a, at 273 ("But since these factors often restate interdependence (at least in the context of an alleged price-fixing conspiracy), they may not suffice—by themselves—to defeat summary judgment on a claim of horizontal price-fixing among oligopolists." (quoting *In re Flat Glass*, 385 F.3d at 361)).

[145] See infra notes 297–98 (discussing importance of these plus factors in concentrated markets).

[146] Leslie, supra note 27, at 1591. See also Matsushita Elec. Indus. Co. v. Zenith Radio Corp., 475 U.S. 574, 591 n.15 (1986) ("[W]ithout barriers to entry it would presumably be impossible to maintain supracompetitive prices . . . .").

[147] Peter Asch & Joseph J. Seneca, Characteristics of Collusive Firms, 23 J. Indus. Econ. 223, 224 (1975) ("Where barriers to entry are substantial, a relatively high incidence of collusive activity is therefore expected, *ceteris paribus*.").

[148] See, e.g., In re Blood Reagents Antitrust Litig., 266 F. Supp. 3d 750, 772 (E.D. Pa. 2017) ("High barriers to entry also make an industry more conducive to collusion." (citing In re

Some courts, however, reject entry barriers as a plus factor when markets are concentrated. The First Circuit, for example, has claimed that "[h]igh barriers to entry and inelastic demand are two hallmarks of oligopolistic markets susceptible to successful parallel pricing practices, but neither helps to distinguish between agreement and mere conscious parallelism as the root cause of those practices."[149] Some judges believe that parallel price increases are to be expected in oligopoly markets with barriers to entry.[150] Federal courts have gone so far as to assert that "structural plus factors" such as entry barriers in a concentrated market "are unfounded under antitrust law."[151] That is untrue.[152] This interpretation of interdependence theory renders the collusion-facilitating aspects of some concentrated markets to be irrelevant and thus negates established plus factors.

ii. Homogeneous Products

Product homogeneity is a plus factor because when products are uniform, cartel partners can more easily fix a single price that all the conspirators will charge.[153] Professor Louis Kaplow has explained that "[p]roduct heterogeneity . . . makes oligopolistic coordination more difficult, which is consistent with the fact that most prosecuted cases involve homogeneous products."[154] It is also easier to detect cheating in a cartel where products are identical, which can deter cartel partners from defecting on the agreement and, thus, stabilize the cartel arrangement.[155] Empirical studies of actual price-fixing cartels have proven that "conspiracy among competitors may arise in any number of situations but it is most likely to occur and endure when numbers are small,

Publ'n Paper Antitrust Litig., 690 F.3d 51, 65 (2d Cir. 2012))); In re Cal. Bail Bond Antitrust Litig., 511 F. Supp. 3d 1031, 1046 (N.D. Cal. 2021) (listing high barriers to entry as a plus factor related to the market's susceptibility to price fixing).

[149] White v. R.M. Packer Co., 635 F.3d 571, 582 (1st Cir. 2011).

[150] Valspar Corp. v. E.I. du Pont de Nemours, 152 F. Supp. 3d 234, 248–49 (D. Del. 2016) ("In a concentrated market with high barriers to entry, 'a higher price generating higher profits will not be undone by the output of new entrants.'" (quoting In re Text Messaging Antitrust Litig., 782 F.3d 867, 872 (7th Cir. 2015))).

[151] Hall v. United Air Lines, Inc., 296 F. Supp. 2d 652, 674 (E.D.N.C. 2003).

[152] Cf. supra note 148 (noting that barriers to entry are a plus factor).

[153] Leslie, supra note 27, at 1592.

[154] Kaplow, supra note 4, at 290.

[155] See id. at 290–91.

concentration is high and the product is homogeneous."[156] This is why "[c]ommodity industries are particularly susceptible to agreements that violate antitrust laws."[157] Because markets with homogeneous products are more susceptible to cartelization,[158] courts treat product homogeneity as a plus factor for proving collusion through circumstantial evidence.[159]

Despite the sound theoretical and empirical reasons for assigning probative value to product homogeneity, several federal courts have undermined this plus factor in situations where the defendants operate in a concentrated market. In *E.I. du Pont de Nemours & Co. v. Federal Trade Commission*,[160] a case involving gasoline additives, the Second Circuit noted "that price uniformity is normal in a market with few sellers and homogeneous products."[161] In affirming summary judgment for defendants accused of fixing prices in the market for potash, an ingredient used in fertilizer, the en banc Eighth Circuit quoted the above passage from the Second Circuit's *Du Pont* opinion[162] and additionally asserted that "[p]articularly when the product in question is fungible, as potash is, courts have noted that parallel pricing lacks probative significance."[163] These courts used the combination of oligopoly and product homogeneity to absolve price-fixing defendants of antitrust liability even when firms were raising prices in lockstep fashion without any cost justification. This legal conclusion is particularly inappropriate given the empirical

[156] George A. Hay & Daniel Kelley, An Empirical Survey of Price Fixing Conspiracies, 17 J.L. & Econ. 13, 26–27 (1974).

[157] In re Broiler Chicken Antitrust Litig., 290 F. Supp. 3d 772, 780 (N.D. Ill. 2017) (citing In re High Fructose Corn Syrup Antitrust Litig., 295 F.3d 651, 658 (7th Cir. 2002)).

[158] See Milk & Ice Cream Can Inst. v. Fed. Trade Comm'n, 152 F.2d 478, 482 (7th Cir. 1946) ("[I]t was easier to reach the goal of uniform prices on a standard product than on one which was not."); In re Titanium Dioxide Antitrust Litig., 959 F. Supp. 2d 799, 822 (D. Md. 2013) ("Indicators that a market is conducive to collusion include the homogeneous and highly standardized, or commodity-like nature, of the product; a concentrated market dominated by a few sellers; [and] high barriers to new players' entry . . . .").

[159] See, e.g., *In re High Fructose Corn Syrup*, 295 F.3d at 656–57 (noting that the product was "highly standardized," which facilitated price collusion); *In re Titanium Dioxide*, 959 F. Supp. 2d at 822.

[160] 729 F.2d 128 (2d Cir. 1984).

[161] Id. at 139 (treating this statement as a concession by the Federal Trade Commission).

[162] Blomkest Fertilizer, Inc. v. Potash Corp. of Sask., 203 F.3d 1028, 1031 (8th Cir. 2000) (en banc) (quoting *E.I. du Pont de Nemours & Co.*, 729 F.2d at 139).

[163] Id. at 1033 (citation omitted); see also Weit v. Cont'l Ill. Nat'l Bank & Trust Co. of Chi., 641 F.2d 457, 463 (7th Cir. 1981) ("Courts have noted that parallel pricing or conduct lacks probative significance when the product in question is standardized or fungible." (citations omitted)); Hall v. United Air Lines, Inc., 296 F. Supp. 2d 652, 674 (E.D.N.C. 2003) (discussing *E.I. du Pont de Nemours & Co.*, 729 F.2d at 139).

literature demonstrating that this combination—market concentration and homogeneous products—most likely facilitates price-fixing conspiracies.[164]

iii. Inelastic Demand

Demand for a product is considered inelastic when consumers will continue to purchase the product even as price rises. Products with inelastic demand are more susceptible to cartelization because the conspiring firms know that they can raise the market price without losing too many sales, and thus collusion will increase their collective profits.[165] By contrast, when demand for a product is elastic, price increases will cause many consumers to stop buying the product, reducing the expected profitability of fixing prices. Understanding this dynamic, courts treat inelastic demand as a plus factor.[166]

Despite the fact that inelastic demand is a plus factor for a good reason, courts have disregarded this plus factor when the defendants' market is concentrated. As noted earlier, the First Circuit in *White v. R.M. Packer Co.*,[167] treated inelastic demand as simply a "hallmark[] of oligopolistic markets" that does not "help[] to distinguish between agreement and mere conscious parallelism."[168] Similarly, the Eleventh Circuit has described "inelastic demand at competitive prices" as simply a characteristic of an oligopoly and, thus, not probative of collusion.[169] This is an odd assertion because market concentration and demand elasticity are independent variables. Whether or not consumers will reduce or cease consumption of a product in response to price increases has nothing to do with how many firms are selling that product. Consequently, courts err when they discount inelastic demand as just another feature of interdependence.

In sum, although market and product characteristics are important plus factors in antitrust analysis, courts have invoked interdependence theory

[164] See Hay & Kelley, supra note 156, at 26–27.

[165] Leslie, supra note 27, at 1591.

[166] See, e.g., id.; In re RealPage, Inc., Rental Software Antitrust Litig. (No. II), 709 F. Supp. 3d 478, 509 (M.D. Tenn. 2023) (listing inelastic demand as a plus factor); United States v. Alcoa, Inc., No. 00-cv-00954, 2001 WL 1335698, at *12 (D.D.C. June 21, 2001) (describing inelastic demand as conducive to collusion); *Blomkest*, 203 F.3d at 1044 (en banc) (Gibson, J., dissenting).

[167] 635 F.3d 571 (1st Cir. 2011).

[168] Id. at 582.

[169] Williamson Oil Co. v. Philip Morris USA, 346 F.3d 1287, 1317 (11th Cir. 2003).

to effectively negate these forms of circumstantial evidence when the defendants operate in a concentrated market.

3. Plus Factors Related to Defendants' Conduct

Many plus factors relate to suspicious actions taken by the defendants before and during the alleged conspiracy. Price-fixing conspirators generally communicate with each other to form and manage their cartel. While all inter-competitor communications have some level of probative value, the exchange of pricing plans is particularly suspicious.[170] Courts, however, have invoked interdependence theory to discount even the most probative of plus factors related to inter-defendant communications.

Because price-fixing conspirators often adjust cartel prices in response to changes in demand, exchange rates, input costs, or other external stimuli, cartel leaders need a mechanism to raise or lower the cartel price when necessary.[171] The mechanisms by which firms share their intentions regarding future pricing with each other range from public price signaling to privately exchanging pricing plans. Price signaling involves firms using public announcements to inform their rivals about their pricing plans. In making price adjustments, cartel managers face a dilemma: miscommunications can destabilize a cartel,[172] but overt direct communications could be evidence of collusion and expose the cartel members to criminal penalties and private damages.[173] To solve the problem of how to coordinate without getting caught, some cartels use price signaling.[174] Because price signaling allows cartel members to communicate about price adjustments without necessarily creating

[170] Leslie, supra note 27, at 1600.

[171] Id. at 1597–98.

[172] Id. at 1598 ("Managing these price variations is important for cartel stability. Miscommunications must be avoided. Any downward movement in price by one cartel member could be misinterpreted by other cartel members as their partners cheating on the cartel, which could result in a tit-for-tat response of lowered prices . . . ."); see also Christopher R. Leslie, High Prices and Low-Level Conspirators, 100 Tex. L. Rev. 839, 860 (2022) ("In order to prevent any miscommunication about price movements, cartel partners keep each other apprised of their planned, or hoped-for, changes in price.").

[173] See In re Ethylene Propylene Diene Monomer (EPDM) Antitrust Litig., 681 F. Supp. 2d 141, 176 (D. Conn. 2009) ("Here, the plaintiffs' evidence of the frequent and friendly communications between the defendants and the secrecy of their meetings is sufficient to allow a reasonable jury to infer that the defendants participated in an unlawful price-fixing conspiracy.").

[174] See Leslie, supra note 27, at 1598–99; William H. Page, Communication and Concerted Action, 38 Loy. U. Chi. L.J. 405, 441–42 (2007).

temporarily disparate prices,[175] it is not surprising that many proven cartels used price signaling to coordinate their collusive price increases.[176] Price signaling is less suspicious but still probative of collusion. Understanding this theory and reality, federal courts treat price signaling as a plus factor.[177]

Some federal courts, however, reject price signaling as a plus factor when the defendant's market is concentrated. For example, in *Holiday Wholesale Grocery Co. v. Philip Morris, Inc*.,[178] in which plaintiffs sued defendants for fixing the price of tobacco products, the district court dismissed the plaintiffs' evidence of price signaling as "nothing more than show[ing] that in an oligopoly, each company is aware of the others' actions. This is the nature of the economic interdependence of the companies in an oligopoly."[179] The Eleventh Circuit affirmed summary judgment for the defendants, holding that the price signals and parallel pricing behavior were "typical of an oligopoly."[180] Similarly, the district court in *Valspar* rejected price signaling as a plus factor, asserting that the plaintiff's "characterization of this evidence largely neglects the theory of interdependence."[181] Relying in part on the Eleventh Circuit's ruling, the judge reasoned that price signaling in an oligopoly must be deprived of probative value because "[w]ere it any other way, any evidence of lawful interdependence would also necessarily be evidence of actionable

[175] The firm may be worried about raising prices unilaterally if it fears that its rivals will not follow suit. Price signaling allows firms to communicate their intentions to raise prices in unison at a future date.

[176] Robert C. Marshall & Leslie M. Marx, The Economics of Collusion: Cartels and Bidding Rings 114–15 (2012) (noting use of price signaling by cartels controlling the markets in sorbates, monochloroacetic acid and organic peroxides, polyester staple, high pressure laminates, amino acids, carbonless paper, cartonboard, and graphite electrodes).

[177] See, e.g., In re Coordinated Pretrial Proc. in Petroleum Prods. Antitrust Litig., 906 F.2d 432, 446–47 (9th Cir. 1990); In re Titanium Dioxide Antitrust Litig., 959 F. Supp. 2d 799, 828 (D. Md. 2013) ("Frequent price increase announcements could have served as 'signals,' making further exchange of actual price information superfluous."); see also In re Broiler Chicken Antitrust Litig., 290 F. Supp. 3d 772, 788 (N.D. Ill. 2017) ("Defendants' public statements of intent to cut production are indicative of an agreement considering the commodity nature of Broilers.").

[178] 231 F. Supp. 2d 1253 (N.D. Ga. 2002), *aff'd sub nom*. Williamson Oil Co. v. Philip Morris USA, 346 F.3d 1287 (11th Cir. 2003).

[179] Id. at 1275.

[180] *Williamson*, 346 F.3d at 1310.

[181] Valspar Corp. v. E.I. du Pont de Nemours & Co., 152 F. Supp. 3d 234, 248 (D. Del. 2016).

conspiracy."[182] In each of these cases, courts used interdependence theory to negate price signaling as a plus factor.

In addition to public price signaling, rival firms sometimes communicate directly with their competitors. While all inter-competitor communications create an opportunity for collusion, competitors exchanging their pricing plans is particularly suspicious. Because these horizontal price exchanges have a natural tendency to increase market prices,[183] these agreements can themselves constitute unreasonable restraints of trade that violate antitrust law.[184] Even if a horizontal price exchange does not independently violate Section One, it is still a plus factor for inferring a conspiracy to fix prices.[185] This makes sense because sharing pricing plans helps cartel managers coordinate the cartel price[186] and allows cartel enforcers to detect cheating by cartel members who are charging less than the cartel-fixed price.[187] Empirically, cartels employ price exchanges—such as price verification arrangements in which rival firms confirm what price they offered to specific customers—to detect cheating among their ranks.[188]

[182] Id. at 249.

[183] Joseph E. Harrington, Jr. & Christopher R. Leslie, Horizontal Price Exchanges, 44 Cardozo L. Rev. 2301, 2321 (2023).

[184] See, e.g., United States v. Container Corp. of Am., 393 U.S. 333, 337–38 (1969); Todd v. Exxon Corp., 275 F.3d 191, 198 (2d Cir. 2001) (explaining how such agreements can violate the rule of reason).

[185] See, e.g., Omnicare, Inc. v. UnitedHealth Grp., Inc., 629 F.3d 697, 709 (7th Cir. 2011) ("Information exchange can help support an inference of a price-fixing agreement . . . ." (citations omitted)); Wilcox v. First Interstate Bank of Or., N.A., 815 F.2d 522, 525 (9th Cir. 1987) (noting that plus factors include "exchange of price information"); Blomkest Fertilizer, Inc. v. Potash Corp. of Sask., 203 F.3d 1028, 1046 (8th Cir. 2000) (en banc) (Gibson, J., dissenting) ("In price fixing cases, the exchange of sensitive price information can sometimes be circumstantial evidence of the existence of a *per se* violation." (citations omitted)).

[186] *Blomkest*, 203 F.3d at 1047 (en banc) (Gibson, J., dissenting) ("The price communications . . . served little purpose other than facilitating price coordination.").

[187] ABA Section of Antitrust Law, Antitrust Health Care Handbook 174 (4th ed. 2010) ("Exchanges of price information . . . facilitate[] the competitors' detecting others 'cheating' on their tacit agreement."); see Leslie, supra note 27, at 1601–02 (discussing price verification as a form of cartel monitoring); *Blomkest*, 203 F.3d at 1047 (en banc) (Gibson, J., dissenting) ("[I]f there were a cartel, it would be crucial for the cartel members to cooperate in telling each other about actual prices charged in order to prevent the sort of widespread discounting that would eventually sink the cartel.").

[188] See Leslie, supra note 27, at 1601–02; United States v. Andreas, 216 F.3d 645, 653 (7th Cir. 2000) (noting the lysine cartel's use of a price verification scheme); Christopher Harding & Jennifer Edwards, Cartel Criminality: The Mythology and Pathology of Business Collusion 179 (Routledge 2016) (noting that the LCD panels cartel used price verification); John M. Connor, Global Price Fixing 293–95 (2d rev. ed. 2008) (discussing the use of price

Despite the reasons for treating horizontal price exchanges as circumstantial evidence of collusion, many courts have discounted this plus factor when the defendants are oligopolists. For example, the plaintiffs in *Blomkest Fertilizer, Inc. v. Potash Corp. of Saskatchewan*[189] accused potash sellers of price fixing, pointing to a series of parallel price increases and several plus factors, which included a price verification regime in which rival firms confirmed what prices they had charged on recently completed sales when asked by each other.[190] Although this is a classic form of cartel enforcement, the Eighth Circuit discounted this plus factor—and affirmed summary judgment for the defendants—*because* the defendants were oligopolists.[191] The majority opinion asserted that "one would expect companies to verify prices considering that this is an oligopolistic industry and accounts are often very large."[192] In essence, the Eighth Circuit used the fact that this was an oligopolistic industry to discount the fact that the rival firms were exchanging price information with each other. Other courts have similarly ruled that horizontal price exchanges are less suspicious in oligopoly markets.[193] Such reasoning is entirely inconsistent with interdependence theory, which predicts that firms in concentrated markets will not directly interact with each other.[194]

Some courts have expanded this reasoning beyond price exchanges. For example, the plaintiffs in *Ross v. American Express Co*.[195] accused banks of conspiring to impose anti-consumer mandatory arbitration clauses on their customers.[196] After the banks formed an inter-competitor working group on mandatory arbitration clauses and held a series of meetings in which they shared their arbitration clauses and discussed their

exchanges by the vitamin B2 cartel); id. at 315 (noting that in the choline chloride cartel, "[c]hecking prices on transactions was not feasible, so the major technique for detecting cheating was for the members to share their internal sales records with each other at the quarterly meetings"); id. at 152 (explaining that the citric acid cartel exchanged sales data to "confirm adherence to the [market] share agreements"); see also William E. Kovacic, Robert C. Marshall, Leslie M. Marx & Halbert L. White, Plus Factors and Agreement in Antitrust Law, 110 Mich. L. Rev. 393, 424 (2011) ("The conveyance of firm-specific production and sales information is important for monitoring compliance with many cartel agreements.").

[189] 203 F.3d 1028 (en banc).

[190] Id. at 1033–34.

[191] Id. at 1034–35.

[192] Id. at 1035.

[193] See, e.g., In re Delta/Airtran Baggage Fee Antitrust Litig., 245 F. Supp. 3d 1343, 1377 (N.D. Ga. 2017).

[194] See infra notes 303–06 and accompanying text.

[195] 35 F. Supp. 3d 407, 413 (S.D.N.Y. 2014).

[196] See Leslie, supra note 128, at 435–51 (analyzing the *Ross* case).

arbitration plans, every bank eventually adopted similar anti-consumer arbitration clauses and then disbanded their working group.[197] Despite finding that the defendants "had an agreement . . . to establish class-action-barring arbitration as an industry norm,"[198] which should have been sufficient to find an antitrust violation,[199] the court ruled for the defendants. The court found no conspiracy had occurred, reasoning that "information-seeking is common in concentrated markets, and such behavior is consistent with conscious parallelism rather than collusion."[200] As in *Blomkest*, the *Ross* court held that inter-competitor information exchanges are not suspicious in concentrated markets. But these cases failed to appreciate that although seeking information about competitors is rational, giving information to competitors makes little sense unless the firms believe their mutual information exchanges will stabilize the market at more profitable prices and contract terms.[201]

In addition to inter-seller communications, suspicious statements by individual defendants can be important circumstantial evidence.[202] At one extreme, an individual employee—whether an executive or a lower-level manager[203]—may provide direct evidence of illegal price fixing, such as by confessing in exchange for leniency.[204] But even non-confessional suspicious statements can be persuasive evidence.[205] Despite cartel policies to not write things down and to destroy incriminating documents,[206] price fixers nonetheless sometimes send letters or emails that are suggestive of collusion.[207]

[197] *Ross*, 35 F. Supp. 3d at 439; see also Leslie, supra note 128, at 438 (discussing and critiquing the *Ross* court's opinion).

[198] *Ross*, 35 F. Supp. 3d at 452.

[199] Leslie, supra note 128, at 447.

[200] *Ross*, 35 F. Supp. 3d at 447.

[201] See Harrington & Leslie, supra note 183, at 2320.

[202] Leslie, supra note 27, at 1609–11.

[203] See generally Leslie, supra note 172 (discussing the roles of various employees in price-fixing conspiracies).

[204] In re High Fructose Corn Syrup Antitrust Litig., 295 F.3d 651, 654 (7th Cir. 2002) ("Because price fixing is a per se violation of the Sherman Act, an admission by the defendants that they agreed to fix their prices is all the proof a plaintiff needs.").

[205] Leslie, supra note 172, at 846 ("Even watercooler conversations can contain suspicious statements from which a reasonable jury could infer the participants' awareness of price fixing, if not an explicit admission. Thus, depending on their content and context, the casual statements of a defendant's employees could be powerful evidence of collusion.").

[206] Leslie, supra note 12, at 1221–23.

[207] See, e.g., In re Flat Glass Antitrust Litig., 385 F.3d 350, 364–66 (3d Cir. 2004) (discussing written statements indicating price-fixing).

Although suspicious statements are circumstantial evidence in any market structure, courts use interdependence theory to deprive suspicious emails of their probative value. In *Valspar*, for example, a lawsuit alleging a price-fixing conspiracy among DuPont, Kronos, and other major titanium dioxide manufacturers, the plaintiff proffered several internal emails, including an email from DuPont that "advocated for a price modification '[o]nly if you are not undercutting a Kronos price increase!'"[208] In a separate email, an employee of one manufacturer attached a price increase from another manufacturer "and indicated that '[e]veryone is now on the bus.'"[209] And in yet another email from mid-September of 2004, one defendant "stated: 'we have competition on board for the Oct 1 price increase announcement.'"[210] Even if these emails do not constitute direct evidence of conspiracy, they are strong circumstantial evidence which—when combined with the plaintiff's evidence of other plus factors[211]—could lead a reasonable jury to infer a price-fixing conspiracy.[212] The district court, however, disregarded these damning emails as simply part of the tug and pull of interdependence. The judge chastised the plaintiff's "characterization of this evidence [because it] largely neglects the theory of interdependence."[213] The court asserted that "oligopolists may maintain supracompetitive prices through rational, interdependent decision making, as opposed to unlawful concerted action, if the oligopolists independently conclude that the industry as a whole would be better off by raising prices."[214] While this is an accurate description of interdependence theory and might explain the DuPont

[208] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 199–200 (3d Cir. 2017) (alteration in original).

[209] Valspar Corp. v. E.I. du Pont de Nemours & Co., 152 F. Supp. 3d 234, 247 (D. Del. 2016) (alteration in original).

[210] Id.

[211] Additional plus factors included the unprecedented number of parallel price hikes—thirty-one—as well as homogeneous products, "a market susceptible to conspiracy," horizontal exchanges of confidential information, price signaling, "intercompany sales of [titanium dioxide] at below market price," relatively static market shares, and suspicious conduct such as "abrupt departure from pre-conspiracy conduct." *Valspar*, 873 F.3d at 218 (Stengel, C.J., dissenting).

[212] Id. ("Viewed together, and not compartmentalized, all this evidence was more than sufficient to preclude summary judgment."); see also Leslie, supra note 27, at 1633 ("If the [*Valspar*] court had not compartmentalized the plus factors, it would have permitted the plaintiffs to make their case to a jury.").

[213] *Valspar*, 152 F. Supp. 3d at 248.

[214] Id. (quoting In re Chocolate Confectionary Antitrust Litig., 801 F.3d 383, 397 (3d Cir. 2015)).

email reference to a Kronos price increase, it does not explain why firms are saying that they "have competition on board" or "on the bus" for a future price increase. A reasonable jury could interpret that as evidence of a conspiracy, not mere interdependence.

4. Using Interdependence Theory to Discount a Bevy of Plus Factors

While the previous discussion illustrated courts discounting individual plus factors, courts sometimes use interdependence theory to lump together multiple plus factors and discount them en masse. For example, the Seventh Circuit in *Kleen Products LLC v. Georgia-Pacific LLC*[215] recognized that the containerboard "market has certain structural features that make it 'conducive to successful collusion,' such as a small number of manufacturers, vertical integration, inelastic demand, a standardized commodity product, and high barriers to entry."[216] But the court considered these multiple plus factors to be a wash because these market "characteristics make it easier for companies either to form a cartel *or* to follow the leader independently."[217] Consequently, although conceding that these factors facilitated cartelization, the court voided this entire bundle of plus factors.

More sweepingly, the Eleventh Circuit in *Williamson Oil Co. v. Philip Morris USA*[218] used interdependence theory to nullify a wealth of plus factors and affirm summary judgment for defendants accused of fixing the price of tobacco. The court noted that the plaintiffs argued

> the structure of the tobacco industry is conducive to price fixing agreements because of a concentration of sellers, inelastic demand at competitive prices, high barriers to entry, a fungible product, principal firms selling at the same level in the chain of distribution, prices that can be changed quickly, cooperative practices and a record of antitrust violations.[219]

[215] 910 F.3d 927 (7th Cir. 2018).

[216] Id. at 935 (quoting Kleen Prods. LLC v. Int'l Paper Co., 831 F.3d 919, 927–28 (7th Cir. 2016)).

[217] Id. (citing In re Text Messaging Antitrust Litig., 782 F.3d 867, 871–72 (7th Cir. 2015)); *In re Chocolate Confectionary*, 801 F.3d at 397.

[218] 346 F.3d 1287, 1317 (11th Cir. 2003).

[219] Id at 1317.

Acknowledging precedent holding "that this industry structure constitutes a plus factor,"[220] the court disavowed the plus factors en bloc because "the majority of the market characteristics on which the class focuses are simply indicia that the tobacco industry is an oligopoly, which is perfectly legal."[221]

In a single sentence, the Eleventh Circuit wiped out several plus factors, treating them all as mere features of oligopoly pricing. Yet many of these plus factors are not inherent in interdependence and often have nothing to do with it. For example, "cooperative practices and a record of antitrust violations" are highly indicative of illegal collusion but are separate and distinct from market structure.

The *Williamson* court also discounted another near-dozen plus factors having nothing to do with market structure, including frequent communications and signaling of price intentions;[222] mutual monitoring of sales and the establishment of permanent allocation programs,[223] which created stable market shares;[224] suspicious activities, such as raising prices without performing the conventional business analysis; the industry's extended history of antitrust violations; foreign price-fixing activities by the defendants; and their participation in other conspiracies involving the health effects of smoking.[225] Ultimately, the court affirmed summary judgment for price-fixing defendants, asserting that since "none of [the proffered plus factors] actually tends to exclude the possibility of independent behavior," the plaintiffs "cannot demonstrate the existence of a plus factor."[226] The court's litany of mistakes began by structuring its entire inquiry through the lens of interdependence theory and viewing plus factors as somehow inherently innocent in a concentrated market.

Courts often focus on oligopoly market structure as somehow exculpatory in a way that invites judges to neglect all other plus factors.

[220] Id. (citing In re High Fructose Corn Syrup Antitrust Litig., 295 F.3d 651, 655 (7th Cir. 2002)).

[221] Id. (citing City of Tuscaloosa v. Harcros Chems., Inc., 158 F.3d 548, 570–71 (11th Cir. 1998)).

[222] Id. at 1305–10.

[223] Id. at 1313–15.

[224] Id. at 1318.

[225] Id. at 1311, 1315–18.

[226] Id. at 1304, 1323. Leslie, supra note 27, at 1634–35 ("The court's language here is troubling; it asserted that the plaintiffs failed to show '*a* plus factor,' *any* plus factor, suggesting that the plaintiffs did not proffer evidence of a single plus factor. The court never looked at the twenty-some plus factors collectively because it falsely asserted . . . that there were no plus factors to aggregate.").

In *In re Chocolate Confectionary Antitrust Litigation*,[227] for example, the Third Circuit asserted that "despite the facial plausibility of the Plaintiff's theory and the circumstantial evidence supporting it, we must be cautious. The U.S. chocolate market is 'a textbook example of an oligopoly,' and we cannot infer too much from mere evidence of parallel pricing among oligopolists."[228] But the plaintiffs had proffered more evidence beyond mere parallel pricing. In addition to proving market concentration, a plus factor unto itself, the plaintiff's proffered evidence of motive,[229] of opportunity (including inter-competitor communications),[230] of rival defendants possessing each other's confidential pricing documents,[231] of parallel price increases unexplained by cost increases,[232] of pretextual explanations for parallel price increases,[233] of actions against self-interest,[234] and of participation in contemporaneous illegal price fixing in another country.[235] But the court looked at these plus factors "cautious[ly]" because of interdependence theory, and consequently the court improperly affirmed summary judgment for the defendants despite an abundance of plus factors.[236]

Unfortunately, the judicial use of interdependence theory to effectively wipe out all the plaintiff's proffered plus factors is not limited to the Third, Seventh, and Eleventh Circuits.[237] Across jurisdictions, the theory of interdependence makes judges "cautious in accepting inferences from circumstantial evidence in cases involving allegations of horizontal price-

[227] 801 F.3d 383 (3d Cir. 2015).

[228] Id. at 397 (citation omitted) (footnote omitted).

[229] The court isolated and discounted the motive plus factor because "evidence of motive without more does not create a reasonable inference of concerted action." Id. at 398.

[230] Id. at 409.

[231] Id. at 407–09.

[232] Id. at 399.

[233] Id. at 410–12.

[234] Id. at 399–401.

[235] Id. at 401–07. For an explanation of why defendants' participation in foreign price-fixing schemes is an important plus factor for proving collusion in the American market, see generally Christopher R. Leslie, Foreign Price-Fixing Conspiracies, 67 Duke L.J. 557 (2017).

[236] In re Chocolate Confectionary Antitrust Litig., 801 F.3d 383, 397 (3d Cir. 2015); see also Leslie, supra note 27, at 1623–24 (detailing errors in case).

[237] See Prosterman v. Am. Airlines, Inc., 747 F. App'x 458, 462 (9th Cir. 2018) ("But even viewed collectively, Plaintiffs' plus factors suggest only conscious parallelism in an interdependent oligopoly."); In re Mylan N.V. Sec. Litig., 666 F. Supp. 3d 266, 318 (S.D.N.Y. 2023) ("The plus factors are necessary, not sufficient, and are still subject to case-specific assessment by the court since 'such plus factors may not necessarily lead to an inference of conspiracy.'" (quoting Apex Oil Co. v. DiMauro, 822 F.2d 246, 254 (2d Cir. 1987))).

fixing among oligopolists."[238] While judicial caution is generally admirable, interdependence theory has converted caution into a de facto requirement of direct evidence of price fixing in concentrated markets.[239] Because direct evidence is rarely available, this distorted view of caution effectively immunizes much price-fixing activity.

D. Interdependence Theory Versus Expert Witnesses

Courts have also used interdependence theory to discount the informed opinions of plaintiffs' experts. For example, in *Valspar*, the plaintiff's economist explained how the concentrated market for titanium dioxide, along with other nonstructural plus factors, supported his "'economic conclusions' that the competitors could not have acted independently."[240] The Third Circuit accused the plaintiff's economist of "get[ting] things backwards" because everyone already acknowledged the titanium dioxide "market was primed for anticompetitive interdependence and that it operated in that manner. Valspar's expert evidence confirming these facts mastered the obvious."[241] The court chastised the economics expert for considering "the type of evidence that we have said is of diminished value in the oligopoly context."[242] Because the market was concentrated, the court completely discounted the plaintiff's expert testimony.

Similarly, the plaintiffs in *In re Chocolate Confectionary* proffered expert reports and testimony of two economists.[243] The experts explained that "the market was ripe for conspiracy" for several reasons: "first, the chocolate market was characterized by a few dominant sellers and high market concentration; second, new firm entry was largely precluded by substantial barriers to entry . . . ; third, defendants each faced similar input cost structures; and fourth, demand throughout the conspiracy period was relatively inelastic."[244] Both economists described how these plus factors increased the profitability of price fixing and increased the likelihood that the parallel price increases were the product of collusion,

[238] In re Flat Glass Antitrust Litig., 385 F.3d 350, 358–59 (3d Cir. 2004) (citations omitted) (collecting cases).

[239] See generally Leslie, supra note 14 (exposing the problem of courts requiring direct evidence of collusion).

[240] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 196–97 (3d Cir. 2017).

[241] Id. at 197.

[242] Id. at 197 n.9.

[243] 999 F. Supp. 2d 777, 789 (M.D. Pa. 2014).

[244] Id. at 789–90.

not interdependence.[245] The court rejected the sufficiency of the expert economists' reasoning and conclusions, asserting that interdependence theory alone explained the precipitous price increases.[246] The Third Circuit affirmed summary judgment for the price-fixing defendants even though the "defendants' own experts reach[ed] many of the same conclusions as [the plaintiffs' experts] with respect to whether market conditions were ripe for collusion[,] . . . agree[ing] . . . that factors such as high market concentration, high entry barriers, collusive opportunities, and closely substitutable products tend to be more 'conducive to conspiratorial behavior.'"[247] In other words, although all economics experts in the case agreed that the defendants' market was conducive to price fixing—and even though the plaintiffs presented a multitude of plus factors unrelated to market structure[248]—judicial intuition outweighed economic expertise.

In both *Valspar* and *In re Chocolate Confectionary*, the judges used interdependence theory to trump actual evidence. The expert testimony was not ruled inadmissible;[249] it was admissible expert evidence from which a reasonable jury could have inferred illegal collusion. But in both cases, federal courts used interdependence theory to reject inferences supported by the evidence and to prevent the plaintiffs from proceeding to trial.

E. Interdependence Theory and Plaintiffs' Burdens

In addition to discounting plus factors and expert testimony, courts use interdependence theory to increase the plaintiff's burden at the summary judgment stage. Relying on interdependence theory, some courts impose heightened "specialized evidentiary standards" for price-fixing claims involving oligopolistic markets.[250] Judges have held that when the defendants operate in an oligopolistic market, it "elevat[es] [p]laintiffs'

[245] See id. at 790.
[246] Id. at 790–91.
[247] Id. at 790 (citation omitted).
[248] See supra notes 227–35 and accompanying text.
[249] See generally Christine P. Bartholomew, Death by *Daubert*: The Continued Attack on Private Antitrust, 35 Cardozo L. Rev. 2147 (2014) (discussing the exclusion of expert evidence in antitrust litigation).
[250] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 193 (3d Cir. 2017) ("[T]his Court has developed specialized evidentiary standards at summary judgment in antitrust cases in general and in oligopoly cases in particular.").

burden of proof in a variety of ways."[251] After raising the plaintiff's burden, courts do not detail how plaintiffs can satisfy this heightened burden absent direct evidence of collusion.

These heightened standards for claims involving concentrated markets can be dispositive.[252] Courts use these heightened standards to isolate and ignore all other plus factors. For example, the district court in *Valspar* held that "[f]or parallel pricing to go 'beyond mere interdependence,' it 'must be *so unusual* that in the absence of an advance agreement, no reasonable firm would have engaged in it.'"[253] The district court then applied that standard to hold that the defendants' parallel price increase announcements did not satisfy the test because that "evidence is entirely consistent with interdependent behavior."[254] But the plaintiffs presented evidence of several other plus factors that were not "consistent with interdependent behavior," such as horizontal "exchanges of confidential information," "intercompany sales of [titanium dioxide] at below market price[s]," and suspicious behavior, such as "abrupt departure from pre-conspiracy conduct."[255] On appeal, the Third Circuit affirmed,[256] characterizing its requirement that plaintiffs prove that "parallel pricing went beyond mere interdependence" as a "demanding rule."[257]

[251] In re Mylan N.V. Sec. Litig., 666 F. Supp. 3d 266, 317 (S.D.N.Y. 2023); see also id. at 318 ("To survive summary judgment on a Section 1 claim in the context of an oligopoly, substantive antitrust law elevates a plaintiff's evidentiary burden.").

[252] See Herbert Hovenkamp, Prophylactic Merger Policy, 70 Hastings L.J. 45, 53 (2018) ("Numerous Sherman Act section 1 decisions involving tight oligopoly industries have rejected price fixing allegations by concluding that conspiracies are more difficult to prove in such markets than in those that are more competitively structured.").

[253] Valspar Corp. v. E.I. du Pont de Nemours & Co., 152 F. Supp. 3d 234, 243 (D. Del. 2016) (emphasis added) (quoting In re Baby Food Antitrust Litig., 166 F.3d 112, 135 (3d Cir. 1999)).

[254] Id.

[255] *Valspar*, 873 F.3d at 218 (Stengel, C.J., dissenting); see also Leslie, supra note 27, at 1632–33 (itemizing plus factors in *Valspar*).

[256] *Valspar*, 873 F.3d at 193.

[257] Id. at 195 (internal quotation marks omitted) (quoting *In re Baby Food*, 166 F.3d at 135); see also In re Domestic Drywall Antitrust Litig., 163 F. Supp. 3d 175, 204 (E.D. Pa. 2016) ("Plaintiffs must submit sufficient evidence to permit an inference of conspiracy that is reasonable in the context of an oligopolistic market, which can prove to be a demanding standard.").

This creates a "paradox of proof,"[258] in which more concentrated markets require plaintiffs to present more evidence.[259] In the market structure that is most conducive to price-fixing conspiracies, antitrust plaintiffs must overcome higher burdens to reach a jury.[260] Unfortunately, these evidentiary burdens are so high that plaintiffs cannot survive summary judgment despite presenting an overwhelming amount of circumstantial evidence of illegal activity in precisely the kinds of markets where price fixing is most likely to occur.[261]

III. THE WEAKNESS OF INTERDEPENDENCE THEORY

As interpreted and applied by federal courts, interdependence theory posits that firms in a concentrated market will not conspire to fix prices because oligopolists can raise prices in parallel without directly communicating by simply watching and mimicking each other's price moves. This Part explores the theoretical reasons why oligopoly firms would choose collusion over interdependence. This Part then surveys the empirical evidence, which conclusively demonstrates that competitors in concentrated markets often conspire to fix prices. This real-world evidence effectively refutes an expansive application of interdependence theory.

Interdependence theory argues that collusion is unnecessary—and thus unlikely—in concentrated markets. But oligopolists still need conspiratorial agreements[262] for several reasons. First, firms may find it difficult to agree on a single fixed price without inter-competitor discussions, especially when different firms have different profit-maximizing prices. Merely following the leader—as interdependence theory suggests—will not work under such circumstances, which makes

[258] See generally Kaplow, supra note 4, at 133–45 (explaining how courts require more proof of collusion in concentrated markets).

[259] Edward D. Cavanagh, *Matsushita* at Thirty: Has the Pendulum Swung Too Far in Favor of Summary Judgment?, 82 Antitrust L.J. 81, 101 (2018) ("That result is perverse; it means the more conducive the market structure is to collusion, the more difficult it is for plaintiffs to prove conspiracy." (citing 12 Phillip Areeda & Herbert Hovenkamp, Antitrust Law ¶ 2002a, at 13–14, 13 n.2 (3d ed. 2012))); Page, supra note 4, at 130 (citing Kaplow, supra note 4, at 133–45).

[260] See In re Mylan N.V. Sec. Litig., 666 F. Supp. 3d 266, 318 (S.D.N.Y. 2023).

[261] See generally Leslie, supra note 27 (discussing how courts isolate circumstantial evidence in price-fixing litigation).

[262] Marshall & Marx, supra note 176, at 3 ("Even for duopolies, such as methylglucamine, vitamin A500 USP, and beta-carotene, explicit collusion was required to substantially elevate prices and profits." (footnote omitted)).

actual negotiations necessary.[263] Many cartels need to have explicit discussions in order to fix an agreed-upon price. In addition to fixing prices, stable conspiracies sometimes require firms to limit output and allocate customers.[264] Such arrangements often require explicit communication. Firms particularly need explicit agreements if the conspiracy is multivariable, involving different products or contract terms.[265] As a law professor, Richard Posner argued that "it seems improbable that prices could long be maintained above cost in a market, even a highly oligopolistic one, without *some* explicit acts of communication and implementation."[266] Long-term price stability often requires collusion, even in a concentrated market.

Second, many price-raising schemes need an enforcement mechanism. Indeed, some courts have rejected price-fixing claims unless the plaintiff presents evidence of a cartel enforcement mechanism.[267] Although cartel cheating is easier to detect in a concentrated market,[268] even oligopolists may need an explicit price-fixing conspiracy to construct an enforcement regime to punish such cheating. Enforcement often entails cartel managers overseeing agreed-upon mechanisms to monitor each other's prices, such as price-verification, collecting sales figures, and employing auditors and spies.[269] Price fixers in concentrated markets need and use

[263] Blomkest Fertilizer, Inc. v. Potash Corp. Sask., 203 F.3d 1028, 1042 (8th Cir. 2000) (en banc) (Gibson, J., dissenting) ("[C]ompetitors may have different preferences on decisions such as pricing and therefore may not be willing just to follow a leader's decision; words (or word substitutes) may be necessary to negotiate a common course of action.").

[264] Christopher R. Leslie, False Analogies to Predatory Pricing, 172 U. Pa. L. Rev. 329, 365–69 (2024).

[265] Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp., 509 U.S. 209, 239 (1993) ("[T]he inherent limitations of tacit collusion suggest that such multivariable coordination is improbable." (citation omitted)).

[266] Richard A. Posner, Oligopoly and the Antitrust Laws: A Suggested Approach, 21 Stan. L. Rev. 1562, 1574 (1969); see also Donald F. Turner, The Definition of Agreement Under the Sherman Act: Conscious Parallelism and Refusals to Deal, 75 Harv. L. Rev. 655, 662 (1962) ("It may well be that in reality a stable and firm pattern of noncompetitive prices is rarely achieved without some kind of agreement.").

[267] See, e.g., In re Baby Food Antitrust Litig., 166 F.3d 112, 137–38 (3d Cir. 1999) (affirming summary judgment for price-fixing defendants because without "any mechanism in place to detect conspirator cheating . . . , no conspiracy, if it existed, could long endure"); In re Tyson Foods, Inc. Sec. Litig., 275 F. Supp. 3d 970, 977 (W.D. Ark. 2017) (suggesting that "producers' abilities to monitor each other's activities" is "[c]rucial . . . to any antitrust conspiracy"); see also Leslie, supra note 30, at 607–09 (discussing courts improperly treating evidence of cartel enforcement as an element instead of a factor).

[268] See supra notes 53–55 and accompanying text.

[269] Leslie, supra note 27, at 1601–02; Leslie, supra note 39, at 611–15.

coordinated responses to penalize firms that sell more than their cartel allotment.[270] The importance of an enforcement device shows why oligopolistic firms might not rely on mere interdependence but instead create a secret cartel structure.

Third, conspiracies are necessary to avoid miscommunications that would destabilize interdependent pricing. Misunderstandings among firms can arise, for instance, because buyers may lie about receiving offers for lower prices in an attempt to play firms off against each other and create distrust among rival firms.[271] Miscommunications can lead to price wars if firms incorrectly interpret innocent price shifts as cheating on an implied understanding or a cartel agreement.[272] Price-fixing conspirators minimize this risk by having frequent collusive conversations to prevent such misunderstandings.[273] Consequently, fixed prices are more stable than interdependent prices. Because the presence of a conspiracy makes those higher prices stickier and more durable,[274] firms in a concentrated market may choose to conspire instead of relying on mere interdependence.

Fourth, an explicit price-fixing agreement reduces the risk that a firm, being the first mover to raise price, will suffer losses because its rivals do not follow the price hike.[275] The Ninth Circuit has recognized that "even

[270] See Leslie, supra note 39, at 615–21.

[271] See Harrington & Leslie, supra note 183, at 2338–42 (discussing and ultimately dismissing the argument that the need to verify a buyer's claim about a rival's price prevents a horizontal price exchange from being an anticompetitive agreement).

[272] Christopher R. Leslie, Antitrust Amnesty, Game Theory, and Cartel Stability, 31 J. Corp. L. 453, 472 (2006) ("Miscommunications are common among cartel members. Members are often quick to believe that another firm has cheated on the cartel agreement. In many historical cartels, such misunderstandings have led to price wars . . . ."); see also Leslie, supra note 27, at 1598 ("Any downward movement in price by one cartel member could be misinterpreted by other cartel members as their partners cheating on the cartel, which could result in a tit-for-tat response of lowered prices that creates a chain reaction of reactive price decreases until the cartel dissolves into competition once again.").

[273] Leslie, supra note 39, at 581 ("Frequent communication also reduces the risk that miscommunication could lead cartel members into erroneously believing that their partners were cutting prices in violation of the cartel agreement. Miscommunication can create distrust. Open lines of constant communication can prevent such miscommunication." (footnote omitted)).

[274] See infra notes 285–90.

[275] 6 Areeda & Hovenkamp, supra note 2, ¶ 1430, at 230 ("Notwithstanding recognized interdependence, oligopolists may have difficulty settling upon a noncompetitive price when there is great peril in charging a supracompetitive price that is not followed and when each is uncertain about its rivals' prospective responses. The uncertainty is compounded when costs and perceptions about market demand differ.").

in highly concentrated markets, a unilateral price hike might be too risky to make without advance agreement if the increase could not be readily reversed without a significant loss of goodwill."[276] Cartelization reduces this risk because firms agree ahead of time which firm will raise prices first and how quickly other firms will follow and match that price increase.[277] Explicit collusive assurances take the guesswork out of predictions, making it more likely that firms will be able to successfully raise the market price.[278]

For these reasons, a stable interdependent equilibrium is much harder to achieve and sustain than a collusive equilibrium.[279] But interdependence theory argues that firms in concentrated markets need not—and do not—conspire to fix prices. So, which position is more accurate? The best way to resolve a battle between competing theories is to examine the relevant empirical evidence.

And the empirical evidence soundly rebuts the interdependence theory claim that oligopoly firms will not collude because they can achieve a stable high-price equilibrium through interdependent pricing. Real-world data proves that illegal collusion does, in fact, occur in concentrated markets. Examinations of actual price-fixing conspiracies reveal that they are "most likely to occur and endure when numbers are small, concentration is high and the product is homogeneous."[280] Studies of mid-twentieth-century cartels report that "[m]arket share, independent of profits, shows a significant association with collusion . . . as firms possessing large shares of their industry's market are more prone to collude than firms with relatively low shares."[281] Of the dozens and dozens of felonious price-fixing conspiracies that have resulted in

[276] In re Coordinated Pretrial Proc. Petroleum Prods. Antitrust Litig., 906 F.2d 432, 444 (9th Cir. 1990).

[277] Leslie, supra note 12, at 1244–45.

[278] Blomkest Fertilizer, Inc. v. Potash Corp. of Sask., 203 F.3d 1028, 1042 (8th Cir. 2000) (en banc) (Gibson, J., dissenting) ("[S]uccessful price coordination requires accurate predictions about what other competitors will do; it is easier to predict what people mean to do if they tell you.").

[279] See id. at 1044 (Gibson, J., dissenting) (noting that in the highly concentrated potash market, "there was excess production capacity, which spurs competition, and a price war, which shows the producers had not been able to achieve a stable interdependent equilibrium").

[280] Hay & Kelley, supra note 156, at 26–27.

[281] Asch & Seneca, supra note 147, at 232; see also Hay & Kelley, supra note 156, at 23–24 (summarizing the results of an empirical study as indicating that "the low cost of planning and enforcing a conspiracy and the smaller likelihood of being caught in concentrated markets, are equally if not more significant factors in stimulating conspiracy").

convictions over the last several years, most happened in oligopoly markets. These price-fixing conspiracies occurred in the type of concentrated markets that the numerous opinions discussed in Part II asserted were inhospitable to price fixing because firms would simply engage in interdependent pricing, not collusion. The empirical data on international price-fixing cartels similarly shows that concentrated markets facilitate collusion.[282]

Both historic and recent data demonstrate that courts are wrong to suggest, let alone hold, that collusion is unlikely in concentrated markets. Precisely because price-fixing conspiracies are easier to initiate, manage, and conceal in concentrated markets,[283] oligopolies are often breeding grounds for such conspiracies. As Professor Bill Page has observed, "most durable cartels have occurred in highly concentrated markets, so express conspiracy must often be necessary to coordinate pricing effectively, even in oligopolies."[284] As applied by courts, interdependence theory is inconsistent with empirical facts. Market concentration makes illegal collusion more likely, not less likely. That's why it's properly considered a plus factor.

The historical record also informs us that cartels occurring in concentrated markets are more likely to have two dangerous characteristics, which increase both the harms and likelihood of price fixing in concentrated markets. First, price fixers in oligopoly markets levy higher overcharges than price-fixing firms in less concentrated markets.[285] This is intuitive because firms in a tight low-membership cartel know that they can raise prices significantly without inviting cheating. Higher overcharges increase consumer injuries from oligopoly cartels.

[282] Yuliya V. Bolotova, Cartel Overcharges: An Empirical Analysis, 70 J. Econ. Behav. & Org. 321, 329 (2009) ("As predicted by cartel theory, cartels are usually organized in concentrated markets with a relatively small number of sellers. The sample of modern international cartels supports this proposition."); see also Warren S. Grimes, The Sherman Act's Unintended Bias Against Lilliputians: Small Players' Collective Action as a Counter to Relational Market Power, 69 Antitrust L.J. 195, 203 n.25 (2001) ("[P]rominent international cartels prosecuted during the 1990s include the lysine and vitamin cartels, each involving a relatively small number of large, international firms.").

[283] See supra Section I.B.

[284] William H. Page, The Role of Efficiency Evidence in Price-Fixing Litigation, 84 Antitrust L.J. 629, 648 (2022).

[285] Bolotova, supra note 282, at 338 ("Overcharges tend to be higher in the markets where cartels have high market shares and the number of cartel participants is small.").

Second, price-fixing conspiracies in concentrated markets last longer. The economics literature establishes that "[c]artels with a greater market share and in more concentrated industries endure longer than those with lower market share and in less concentrated industries."[286] Cartels may survive better in concentrated industries because cheating is less likely to occur and destabilize the cartel.[287] Members of smaller cartels are more likely to establish mutual trust, which stabilizes price-fixing conspiracies and extends their duration.[288] A smaller number of conspirators allows the cartel to form more easily[289] and be more nimble in responding to exogenous demand or price shocks that threaten to disrupt the cartel. Cartel experts Margaret Levenstein and Valerie Suslow conclude that "for a variety of reasons we expect cartel duration to be positively related to concentration in the cartelized industry and negatively related to the number of participants in the cartel."[290] Because cartels in concentrated markets live longer, they are more profitable for the participants and inflict greater harms on consumers. This increases the expected profits of price fixing in concentrated markets, which increases the likelihood that firms in a concentrated market will collude to raise prices.

IV. THE RELATIONSHIP BETWEEN INTERDEPENDENCE THEORY AND PLUS FACTORS

In the absence of direct evidence of a price-fixing conspiracy, the purpose of antitrust litigation is to determine whether the defendants' parallel price increases are the result of conspiracy or interdependence. Plus factors help judges and juries "distinguish between innocent

[286] Feuerstein, supra note 51, § 9.2, at 184; see also Simon J. Evenett & Valerie Y. Suslow, Preconditions for Private Restraints on Market Access and International Cartels, 3 J. Int'l Econ. L. 593, 614 (2000) ("Cartel duration tends to rise when the participating firms have a greater market share and are in a more highly concentrated industry.").

[287] Margaret C. Levenstein & Valerie Y. Suslow, Breaking Up Is Hard to Do: Determinants of Cartel Duration, 54 J.L. & Econ. 455, 459–60 (2011) (noting that market concentration can lengthen cartel duration in part because "the observability of cheating . . . is more difficult with a large number of firms"); Blomkest Fertilizer, Inc. v. Potash Corp. of Sask., 203 F.3d 1028, 1042–43 (8th Cir. 2000) (en banc) (Gibson, J., dissenting) ("[A] cartel can only succeed for any period of time if it has the ability to detect cheating and punish it effectively." (citations omitted)).

[288] See Leslie, supra note 39, at 590–91.

[289] Evenett & Suslow, supra note 286, at 617 ("Concentration may reflect barriers to entry, or it may be that fewer participants make it easier to form an agreement.").

[290] Levenstein & Suslow, supra note 287, at 460.

interdependence and illegal conspiracy."[291] Although market concentration alone is insufficient to prove collusion,[292] when market concentration is accompanied by other plus factors, a reasonable jury can infer that collusion has occurred.[293] Even when parallel pricing seems like interdependence, a conspiracy can be reasonably inferred when other plus factors are present.[294]

As discussed in Part II, courts have used interdependence theory to discount a host of plus factors. Judges have conflated some plus factors—such as motive and actions against self-interest—with interdependence, and they have discounted plus factors related to market and product characteristics as simply restating interdependence. But courts have also used interdependence theory to negate plus factors regarding the defendants' conduct, most of which are unrelated to market structure. This Section explains how courts have misunderstood the relationship between plus factors and interdependence theory.

Interdependence theory does not diminish plus factors that have nothing to do with market concentration. Many plus factors involve

[291] *Blomkest*, 203 F.3d at 1043 (en banc) (Gibson, J., dissenting).

[292] See Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 191 (3d Cir. 2017) ("Oligopolies pose a special problem under § 1 because rational, independent actions taken by oligopolists can be nearly indistinguishable from horizontal price fixing.").

[293] In re Dynamic Random Access Memory (DRAM) Indirect Purchaser Antitrust Litig., 28 F.4th 42, 52 (9th Cir. 2022) ("Extreme market concentration may suggest conspiracy, particularly when accompanied by other plausible plus factor allegations." (citing In re Musical Instruments & Equip. Antitrust Litig., 798 F.3d 1186, 1197 n.14 (9th Cir. 2015))); In re Propranolol Antitrust Litig., 249 F. Supp. 3d 712, 718 (S.D.N.Y. 2017) ("Instead, a conspiratorial agreement 'may be inferred on the basis of conscious parallelism, when such interdependent conduct is accompanied by circumstantial evidence and plus factors.'" (quoting Mayor of Balt. v. Citigroup, Inc., 709 F.3d 129, 136 (2d Cir. 2013))).

[294] Gamm v. Sanderson Farms, Inc., 944 F.3d 455, 465 (2d Cir. 2019) (noting that an "inference" of price fixing "may arise through the alleging of 'conscious parallelism, when such interdependent conduct is accompanied by circumstantial evidence and plus factors'" (quoting Todd v. Exxon Corp., 275 F.3d 191, 198 (2d Cir. 2001))); see also In re Ethylene Propylene Diene Monomer (EPDM) Antitrust Litig., 681 F. Supp. 2d 141, 170 (D. Conn. 2009) ("[E]ven if evidence of this plus factor [(oligopoly)] may not, by itself, be sufficient to defeat the . . . defendants' motion for summary judgment, it is a basis for inferring the existence of a horizontal price-fixing agreement, especially when introduced in conjunction with evidence supporting the other two plus factors." (citation omitted)); Fleischman v. Albany Med. Ctr., 728 F. Supp. 2d 130, 159 (N.D.N.Y. 2010) ("Courts have also found circumstantial evidence of an agreement through evidence of parallel pricing coupled with other '"plus factors" tending to establish that the defendants were not engaging merely in oligopolistic price maintenance or price leadership but rather in a collusive agreement to fix prices or otherwise restrain trade.'" (quoting City of Tuscaloosa v. Harcros Chems., Inc., 158 F.3d 548, 570–71 (11th Cir. 1998))).

activity or circumstances that are inherently suspicious regardless of the level of market concentration. For example, when rival firms buy and sell their products from each other—especially at non-market prices—this is a plus factor because it resembles a cartel enforcement mechanism that stabilizes relative market shares as a cartel would.[295] Yet courts have ignored intercompetitor sales in concentrated markets because of interdependence theory.[296] This is a mistake because interdependence theory does not undermine—let alone negate—those plus factors that are not characteristics of an oligopoly market.

And while some plus factors overlap with market concentration, courts err by disregarding those plus factors as simply restating interdependence.[297] Plus factors such as motive to conspire and actions against self-interest reinforce the probative value of market concentration. For example, market concentration is an important plus factor *because* it maximizes the motive to engage in price fixing. Similarly, actions against independent interest—such as initiating a seemingly unilateral price increase—are not irrelevant in a concentrated market. The probative value of these actions is affected by the surrounding plus factors. If a group of competitors in an oligopoly market meets, and soon thereafter one firm hikes its price and is quickly followed by the other meeting attendees, that is suspicious. If the rivals took efforts to conceal their meeting, the subsequent price increases are even more suspicious.[298] Each additional plus factor makes the plaintiff's circumstantial case stronger. The fact that an individual plus factor is consistent with interdependence does not necessarily negate its probative value.

In addition to being an important plus factor unto itself, market concentration provides important context for other plus factors. The court in *Jones v. Micron Technology Inc*.[299] explained that "[a]llegations concerning plus factors are particularly important in oligopolistic markets because such allegations contextualize the significance of the parallel conduct."[300] For example, the Supreme Court has recognized that the

[295] See Leslie, supra note 56, at 11–23.

[296] See supra notes 253–57 and accompanying text.

[297] See supra Subsection II.C.1.

[298] See Leslie, supra note 12, at 1206–13.

[299] 400 F. Supp. 3d 897 (N.D. Cal. 2019).

[300] Id. at 916; cf. Quality Auto Painting Ctr. of Roselle, Inc. v. State Farm Indem. Co., 917 F.3d 1249, 1286 (11th Cir. 2019) (Wilson, J., dissenting in part) ("Market structure susceptible to collusion is not independently a plus factor, but it can place other allegations 'in a context

anticompetitive effects of information exchanges may flow from aspects of industry structure, such as market concentration.[301] Consequently, when defendants exchange prices in a concentrated market, that should increase the probative value of the price exchange plus factor.[302] In other words, some plus factors are more suspicious precisely because they are occurring in oligopoly markets.

Most importantly, some plus factors directly discredit interdependence theory. Interdependence signifies that the firms are not in dialogue with each other, but rather are acting independently and attempting to anticipate their rivals' responses. The plus factor of inter-competitor communications[303] shows that interdependence theory is unable to explain the oligopolists' behavior because that theory asserts that oligopolists can simply observe each other's market behavior and react accordingly *without communicating*. Federal courts, however, repeatedly use interdependence theory to negate the significance of rival firms communicating with each other before engaging in parallel price increases.[304] Recall that a court has used interdependence theory to hold that there was nothing suspicious about airlines in an oligopoly market sharing their pricing policies with each other.[305] But interdependence theory predicts that this will not happen. Evidence of price exchanges *disproves* interdependence as an explanation for the defendants' parallel price increases.[306]

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that raises a suggestion of preceding agreement.'" (quoting Bell Atl. Corp. v. Twombly, 550 U.S. 544, 557 (2007))).

[301] United States v. U.S. Gypsum Co., 438 U.S. 422, 441 n.16 (1978) ("A number of factors including most prominently the structure of the industry involved and the nature of the information exchanged are generally considered in divining the procompetitive or anticompetitive effects of this type of interseller communication."); United States v. Container Corp. of Am., 393 U.S. 333, 337 (1969) (finding that in "the corrugated container industry[, which] is dominated by relatively few sellers . . . the exchange of price information has had an anticompetitive effect in the industry").

[302] See Gainesville Utils. Dep't v. Fla. Power & Light Co., 573 F.2d 292, 303 (5th Cir. 1978) ("We realize that some courts have been reluctant to find a conspiracy in such a concentrated market, but the Supreme Court, in determining if the exchange of price information was illegal, has considered whether an industry was 'dominated by relatively few sellers.'" (footnote omitted) (quoting *Container Corp.*, 393 U.S. at 337)).

[303] See Leslie, supra note 27, at 1590 (explaining why inter-competitor communications are a plus factor).

[304] See, e.g., supra notes 222–26.

[305] See Prosterman v. Am. Airlines, Inc., 747 F. App'x 458, 461 (9th Cir. 2018); In re Delta/Airtran Baggage Fee Antitrust Litig., 245 F. Supp. 3d 1343, 1377 (N.D. Ga. 2017).

[306] Valspar Corp. v. E.I. du Pont de Nemours & Co., 873 F.3d 185, 208 (3d Cir. 2017) (Stengel, C.J., dissenting) ("Unilateral exchanges of confidential price information, like other

Similarly, suspicious statements by defendants indicating cartel participation can be strong circumstantial evidence of conspiracy. Yet recall that, in affirming summary judgment for defendants accused of fixing the price for titanium dioxide, the Third Circuit in *Valspar Corp. v. E.I. du Pont de Nemours & Co.* invoked interdependence theory to sap incriminating emails of their probative value, including assurances that rival firms "have competition on board" for planned price increases.[307] That is the language of agreement, not interdependence. Interdependence theory cannot explain the highly incriminating language of the emails among titanium dioxide manufacturers. Instead, these emails strongly suggest that the firms were acting collusively, not interdependently.

Other plus factors also cast doubt on interdependence as an explanation for the defendants' parallel conduct. For example, when the defendant firms in a concentrated market have a history of actual collusion, including fixing prices in foreign markets, this undermines interdependence theory, which predicts that these firms would not collude. Yet the Eleventh Circuit affirmed summary judgment for tobacco companies in *Williamson Oil Co. v. Philip Morris USA* by relying on interdependence theory to discount plus factors such as "cooperative practices and a record of antitrust violations."[308] This makes no sense because cooperative practices are the antithesis of interdependence, and a history of antitrust violations proves that these firms have previously conspired instead of using interdependence.

For each of these plus factors, courts have improperly flipped the relationship between interdependence theory and plus factors. Interdependence theory should not negate plus factors because these plus factors show that interdependence theory cannot adequately explain the defendants' parallel price increases. The presence of these plus factors creates a genuine issue of material fact that entitles the plaintiffs to a trial. Instead, courts consistently invoke interdependence theory to grant and affirm summary judgment for price-fixing defendants despite plaintiffs presenting multiple plus factors that support an inference that the defendants agreed to fix prices.

non-price actions against self-interest, 'cannot simply be explained as a result of oligopolistic interdependence.' " (quoting In re Flat Glass Antitrust Litig., 385 F.3d 350, 361 n.12 (3d Cir. 2004))).

[307] See supra notes 208–14 and accompanying text.

[308] See supra notes 218–26 and accompanying text (discussing *Williamson Oil Co. v. Philip Morris USA*, 346 F.3d 1287 (11th Cir. 2003)).

Judicial deference to interdependence theory is likely to create false negatives[309] because cartels try to make their price fixing look like interdependence. For example, members of the multi-billion-dollar international vitamins cartels would hold secret annual meetings near Basel, Switzerland every August during which the following year's fixed prices were negotiated.[310] In addition to exchanging price information and collaborating on price increases, the conspirators "also agreed which of their members would take the lead in announcing the price increase . . . . Then after the anointed 'price leader' announced the new list prices, the others would pretend to follow an increase that had been preordained eight months earlier."[311] Economist John Connor has described how "members of the vitamins cartels went to extraordinary lengths to hide their activities. The announcements about price increases were by prearrangement rotated among sellers to give the false impression of mere price leadership."[312]

Price-fixing conspirators plan their cover stories to explain the parallel price increases, should antitrust officials question them.[313] Economists Robert Marshall and Leslie Marx have explained that cartelists will plan to invoke interdependence, telling each other,

> We can defeat any investigation into our pricing conduct by the competition authorities by invoking the defense of oligopolistic interdependence and citing "justifications" for price increases, where the "justifications" have been discussed and agreed upon at our last cartel meeting. We will have our story straight before we are asked, in anticipation of being asked.[314]

Marshall and Marx note, for instance, that members of the international cartonboard cartel "believed they could use oligopolistic interdependence as a defense for certain of their actions."[315] Judges should be vigilant in distinguishing between subterfuge and true interdependence. But many courts have failed to correctly differentiate between these two

[309] A false negative exists when courts decide that illegal conduct has not occurred when in fact it has.

[310] Connor, supra note 188, at 281.

[311] Id.

[312] Id. at 317.

[313] Leslie, supra note 12, at 1213–19.

[314] Marshall & Marx, supra note 176, at 51–52.

[315] Id. at 52 n.66.

explanations and have improperly used interdependence theory to weaken plaintiffs' ability to prove collusion through circumstantial evidence.

Antitrust jurisprudence would benefit significantly if federal judges better understood how and where price-fixing cartels take root. Judges should appreciate how market concentration facilitates collusion. That is why most observed price-fixing conspiracies take place in concentrated markets. Courts would be less likely to improperly grant summary judgment to price-fixing defendants based on interdependence theory if judges fully comprehended how often firms in concentrated markets in fact choose to conspire instead of relying solely on conscious parallelism, as interdependence theory predicts. Greater cartel literacy among federal judges would reduce the risk of false negatives, and the requirement that plaintiffs present a sufficient bundle of plus factors should protect price-fixing defendants against false positives. Improving judicial accuracy in price-fixing cases would benefit individual consumers and the overall economy.

CONCLUSION

Interdependence theory is not inherently wrong. But neither is it a universal explanation for all parallel price increases in all concentrated markets. Sometimes these price hikes are the result of interdependence and sometimes they result from collusion. When plaintiffs present a bundle of plus factors, courts should let juries decide which explanation is more plausible based on the facts of the case.

Judges and juries should appreciate that although price-fixing conspiracies occur in all market structures, concentrated markets are more conducive to anticompetitive collusion. A concentrated market structure is neither necessary nor sufficient to create an inference of collusion. But market concentration is nonetheless probative of conspiracy. It is an important plus factor that should be considered holistically in conjunction with all the plaintiffs' other proffered plus factors. Instead of using interdependence to reject plus factors and grant summary judgment to price-fixing defendants, courts should recognize that when these plus factors are present in a concentrated market, their probative value increases significantly.

When courts mistake collusion for interdependence, they reward the price fixing of the past and increase firms' incentives to fix prices in the future. This harms consumers today and tomorrow. Misuse of interdependence theory would be less likely if judges better appreciated

the frequency with which firms in concentrated markets do illegally conspire to fix prices.