PRECEDENTIAL

UNITED STATES COURT OF APPEALS
FOR THE THIRD CIRCUIT

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No. 24-3006

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KAREN CORNISH-ADEBIYI; LUIS SANTIAGO;
MONICA BLAIR-SMITH, individually and on behalf of all
others similarly situated,

Appellants

v.

CAESARS ENTERTAINMENT, INC.; BOARDWALK
REGENCY LLC, d/b/a Caesars Atlantic City Hotel &
Casino; HARRAHS ATLANTIC CITY OPERATING
COMPANY, LLC, d/b/a Harrahs Resort Atlantic City Hotel
& Casino; TROPICANA ATLANTIC CITY
CORPORATION, d/b/a Tropicana Casino and Resort
Atlantic City; MGM RESORTS INTERNATIONAL;
MARINA DISTRICT DEVELOPMENT COMPANY, LLC,
d/b/a Borgata Hotel Casino & Spa; HARD ROCK
INTERNATIONAL INC.; SEMINOLE HARD ROCK
SUPPORT SERVICES, LLC; BOARDWALK 1000, LLC,
d/b/a Hard Rock Hotel & Casino Atlantic City; CENDYN
GROUP, LLC

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On Appeal from the United States District Court
for the District of New Jersey
(D.C. No. 1:23-cv-02536)
District Judge: Honorable Karen M. Williams

Argued: September 17, 2025

Before: RESTREPO, McKEE, and SMITH, *Circuit Judges.*

(Opinion filed: July 29, 2026)

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OPINION OF THE COURT

McKEE, *Circuit Judge.*

Plaintiffs, casino-hotel guests, appeal the District Court's dismissal of their Complaint alleging that Defendants, select casino-hotels in Atlantic City and their algorithmic software provider, Cendyn Group, LLC, have conspired to fix prices of hotel rooms in violation of Section 1 of the Sherman Antitrust Act. For the reasons that follow, we will reverse the District Court's dismissal of the Complaint and remand for further proceedings consistent with this opinion.

I.

Section 1 of the Sherman Antitrust Act is deceptively simple. It states: "Every contract, combination . . ., or conspiracy, in restraint of trade or commerce . . ., is declared to be illegal."[1] But every contract imposes some restraint on trade; indeed, that is the very point of entering into a contractual relationship. Accordingly, very early on, the Supreme Court interpreted Section 1 to apply only to "unreasonable" restraints on trade.[2]

Few would doubt that today's business world is unrecognizable from the world in 1890 when Congress enacted the Sherman Act. Today, software programs automated with artificial intelligence ("AI") can help businesses optimize operations, respond rapidly to demand fluctuations, reduce transaction costs, and enhance market transparency and efficiency in ways that were unimaginable in 1890.[3]

It is therefore not surprising that researchers have cautioned that in today's business environment, AI programs that provide "dynamic pricing" algorithms can also facilitate

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[1] 15 U.S.C. § 1.

[2] *See Standard Oil Co. of New Jersey v. United States*, 221 U.S. 1, 87 (1911).

[3] *See generally* Darrell M. West & John R. Allen, *How Artificial Intelligence is Transforming the World*, BROOKINGS (Apr. 24, 2018), https://www.brookings.edu/articles/how-artificial-intelligence-is-transforming-the-world/ [https://perma.cc/UQ5Z-VQKW].

anticompetitive behavior.[4] Historically, successful collusion may have been hindered by gaps in communication and the cost of ensuring compliance. Today, these algorithms have the capacity to bridge any such gaps.[5] This makes it possible for firms to collude in ways that were inconceivable in 1890. Collusion among competitors in today's world need not be characterized by handshakes (or a wink and a nod) in smoke-filled rooms or by tell-tale telephone conversations. Instead, AI can enable participants in the marketplace to coordinate pricing and thereby collude in ways that reduce competition at the expense of consumers who bear the brunt of higher prices and reduced output or supply. This is what the Sherman Act is intended to prevent.

This appeal asks us to consider whether Plaintiffs have plausibly alleged that Defendants have colluded to fix the prices of casino-hotel guest rooms in violation of Section 1 of

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[4] We discuss algorithms and dynamic pricing in more detail *infra* Part II.

[5] *See, e.g.*, Zach Y. Brown & Alexander MacKay, *Competition in Pricing Algorithm*, 15 AM. ECON. J.: MICROECONOMICS 109, 115 (2023); Kevin T. White & Tammy W. Cowart, *Behind the Cloaking Device: Is There an Anti-Competitive Agreement Lurking under the Use of Common Pricing Algorithms by Multifamily Landlords?*, 63 WASHBURN L. J. 287, 292 (2024). *But see* Jeanine Miklós-Thal & Catherine Tucker, *Collusion by Algorithm: Does Better Demand Prediction Facilitate Coordination Between Sellers?*, 65 MGMT SCI. 1552, 1553 (2019) (finding that better demand forecasting by algorithms "increases each firm's temptation to undercut price in periods when consumers are predicted to be willing to pay high prices").

the Sherman Act.[6] According to Plaintiffs' Consolidated Amended Complaint ("CAC"), the casino-hotels send their "current, non-public room pricing and occupancy data" to Cendyn's Rainmaker software, an AI-powered dynamic pricing program, which then processes each casino-hotel's non-public data, "along with" similar data provided by their competitors, and thereby generates suggested room rates for each of the participating casino-hotels.[7] Rainmaker, according to Plaintiffs, then functions as a coordinating mechanism, using the collective data to generate anticompetitive prices across participating casino-hotels. Plaintiffs allege that the resulting anticompetitive rates are automatically uploaded into each casino-hotel's room-selling platform, causing consumers to pay anticompetitively high prices for guest rooms. This practice is allegedly a "stark change from how [casino-hotels] independently priced rooms for years" at "significantly reduced room rates" in order to draw guests to their casinos, since "gambling has always been the main revenue driver and profit center for casino-hotels."[8] According to the allegations in the CAC, Cendyn's software allows casino-hotel Defendants to maintain the resulting inflated room rates without fear that potential hotel guests will be induced to book rooms with one of their competitors because the colluding casino-hotels have collectively agreed to charge the

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[6] Casino-hotels differ from standard hotels in that they are engaged in providing short-term lodging in hotel facilities with a casino and other entertainment facilities on the premises. *See Gaming & Gambling*, LIBR. OF CONG. RSCH. GUIDES, https://guides.loc.gov/tourism-and-travel/gambling [https://perma.cc/F5UT-C6E9].

[7] App. 211-12 (CAC ¶ 6.)

[8] App. 308 (CAC ¶¶ 311-12**).**

anticompetitively high rates recommended by Cendyn's Rainmaker software. According to the CAC, Cendyn notes that its clients, including Defendant casino-hotels, do in fact charge the room rate recommended by Rainmaker 90 percent of the time. According to the CAC, the Defendants can thereby charge inflated rates for their hotel rooms without fear that their prices will be undercut by a competitor in the Atlantic City market.

The District Court dismissed the CAC because it concluded that Plaintiffs did not sufficiently plead the existence of a hub-and-spoke price-fixing scheme. The court reasoned that Plaintiffs' allegations failed to show a "rim," i.e., an agreement between the casino-hotel defendants. We disagree. We hold that the well-pleaded allegations in the CAC are sufficient to support a finding that casino-hotel Defendants have conspired to fix prices through Cendyn's software. Accordingly, we will reverse the District Court's order dismissing the Complaint.

II.

As we have already noted, advancements in technology have resulted in software capabilities dubbed "artificial intelligence" or "AI"—program- and machine-based systems comprised of multiple algorithms.[9] An algorithm is a set of

[9] Leah Friedman, Nancye Blair Black, Erin Walker & Jeremy Roschelle, *Safe AI In Education Needs You*, COMMC'NS OF THE ACM: BLOG@CACM (Nov. 8, 2021), https://web.archive.org/web/20211113002115/https://cacm.acm.org/blogs/blog-cacm/256657-safe-ai-in-education-needs-you/fulltext; *see also* White & Cowart, *supra* note 5, at 292.

rules programmed to produce a defined output based on specific inputs.[10] It sometimes functions as a group of step-by-step instructions dictating how to process incoming data.[11] Software programs using AI process data through a series of algorithms in order to make a prediction, solve a problem, interpret conditions, or actuate something, such as activating autopilot control of a system.[12]

One feature of highly advanced AI programs is machine learning—a process by which an AI program uses the large amounts of data available to it to continuously learn and improve on previous outputs.[13] "The function of a machine learning system can be *descriptive*, meaning that the system uses the data to explain what happened; *predictive*, meaning the system uses the data to predict what will happen; or

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[10] *See* Brown & MacKay, *supra* note 5, at 115.

[11] Chris Lewis, *The Need for a Legal Framework to Regulate the Use of Artificial Intelligence*, 47 U. DAYTON L. REV. 285, 289 (2022).

[12] *Id.* (*citing* Stephen F. DeAngelis, *Artificial Intelligence: How Algorithms Make Systems Smart*, WIRED, https://web.archive.org/web/20160210095249/https://www.wired.com/insights/2014/09/artificial-intelligence-algorithms-2/ (last visited May 17, 2022)).

[13] *See* Sara Brown, *Machine Learning, Explained*, MIT SLOAN SCH. MGMT, https://mitsloan.mit.edu/ideas-made-to-matter/machine-learning-explained [https://perma.cc/5TMG-R47W]; *see also* OECD, ALGORITHMS AND COLLUSION: COMPETITION POLICY IN THE DIGITAL AGE 9 (2017), www.oecd.org/competition/algorithms-collusion-competition-policy-in-the-digital-age.htm [https://perma.cc/BL4U-LNAP].

prescriptive, meaning the system will use the data to make suggestions about what action to take."[14] The more voluminous the data inputs, the more refined the program's outputs will be.[15]

Dynamic pricing algorithms are prescriptive AI systems that automate pricing for sellers in marketplaces.[16] These algorithmic programs are typically trained on data specific to a vendor or market to suggest (and in some cases implement) prices.[17] They learn through an iterative process of "trial and error and through finding patterns from a great volume and variety of data."[18] They may use data "related to past, present, and future supply and demand conditions," including data on competitors' public prices, to allow vendors to adjust prices frequently at a lower transaction cost.[19] Although dynamic pricing algorithms vary in settings, parameters, function, and sophistication, they share the common purpose of "optimiz[ing] business processes, [thereby] allowing businesses to gain a competitive advantage by . . . setting

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[14] Thomas W. Malone, Daniela Rus, & Robert Laubacher, *Artificial Intelligence and the Future of Work*, MASS. INST. TECH. WORK OF THE FUTURE 6 (2020), 2020-Research-Brief-Malone-Rus-Laubacher2.pdf [https://perma.cc/L8SA-8R3G].

[15] *See id.*

[16] Giacomo Calzolari & Philip Hanspach, *Pricing Algorithms Out of the Box: A Study of the Repricing Industry*, 21 J. COMPETITION L. & ECON. 163, 163 (2025).

[17] *See id.*; *see also* Joseph E. Harrington, Jr., *The Challenges of Third Party Pricing Algorithms for Competition Law*, 26 THEORETICAL INQUIRIES IN LAW 123, 126 (2025).

[18] OECD, *supra* note 13, at 16.

[19] *See* Brown & MacKay, *supra* note 5, at 115.

optimal prices that effectively respond to market circumstances."[20] Indeed, these algorithms have become a common feature of many markets, including "[r]ide-sharing apps, airlines, and [major online retailers]" and thus shape the marketplace for millions of Americans every day.[21]

It is important to note that "[t]here is nothing inherently wrong [or anticompetitive] with using [algorithms] to engage more effectively in commercial activity, regardless of whether that activity is participation in the financial markets or the selling of goods and services."[22] Nevertheless, the potential for abuse is obvious. It is therefore not surprising that many leading economists and legal scholars have raised concerns about the potential drawbacks of dynamic pricing algorithms on consumers and market competition, such as increased prices and reduced output.[23] Some suggest that these programs may be able to "facilitate price-fixing and … collusion" and thus must be "treated with skepticism" to ensure that they do not

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[20] *See* White & Cowart, *supra* note 5, at 292 (citing OECD, *supra* note 13, at 11).

[21] Alexander MacKay & Samuel N. Weinstein, *Dynamic Pricing Algorithms, Consumer Harm, and Regulatory Response*, 100 WASH. U. L. REV. 111, 113 (2022).

[22] Maureen K. Ohlhausen, *Should We Fear the Things That Go Beep in the Night? Some Initial Thoughts on the Intersection of Antitrust Laws and Algorithmic Pricing*, FED. TRADE COMM'N 3 (May 23, 2017), https://www.ftc.gov/system/files/documents/public_statements/1220893/ohlhausen_-_concurrences_5-23-17.pdf [https://perma.cc/Z2N8-5GWF].

[23] *See, e.g.*, MacKay & Weinstein, *supra* note 21, at 129.

cross the line established by the Sherman Act.[24] Here, Plaintiffs allege that the casino-hotels' use of Cendyn's dynamic pricing algorithm crossed the line, from procompetitive efficiency to anticompetitive collusion, and thereby unreasonably interfered with market competition.

III.

A. Section 1 of the Sherman Act

Section 1 of the Sherman Act provides: "Every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several States, or with foreign nations, is declared to be illegal."[25] As this court has emphasized, "Section 1 only prohibits contracts, combinations, or conspiracies that *unreasonably* restrain trade."[26] We have interpreted the terms "contract, combination, . . . or conspiracy" collectively to require some form of agreement or "concerted action."[27] In other words, a plaintiff

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[24] Brief for Antitrust Law & Economic Professors as Amicus Curiae Supporting Appellants, at 4 (citing MacKay & Weinstein, *supra* note 21, at 129).

[25] 15 U.S.C. § 1.

[26] *Toledo Mack Sales & Serv., Inc. v. Mack Trucks, Inc.*, 530 F.3d 204, 218 (3d Cir. 2008) (quoting *In re Flat Glass Antitrust Litig.*, 385 F.3d 350, 356 (3d Cir. 2004)).

[27] *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d 300, 315 (3d Cir. 2010) (quoting *In re Baby Food Antitrust Litig.*, 166 F.3d 112, 117 (3d Cir. 1999)); *see also Burtch v. Milberg Factors, Inc.*, 662 F.3d 212, 221 (3d Cir. 2011) ("Section 1 claims always require the existence of an agreement." (citation modified)).

alleging a violation of Section 1 must plausibly show that defendants had a "unity of purpose," a "common design and understanding," a "meeting of minds," or a "conscious commitment to a common scheme."[28] A plaintiff may support allegations of a collusive agreement either with direct evidence or circumstantial evidence. Because direct evidence, "the proverbial 'smoking gun,'" is usually unavailable to those outside the alleged conspiracy, "plaintiffs have been permitted to rely solely on circumstantial evidence (and the reasonable inferences that may be drawn therefrom) to prove a conspiracy."[29] Indeed, they must be permitted to do so if the law is to reach more sophisticated or surreptitious agreements.

Secondly, a plaintiff must show that this agreement or concerted action "imposed an unreasonable restraint on trade."[30] Most restraints of trade are analyzed under the "rule of reason," which requires comprehensively looking at the market in which the defendant operates and then weighing the alleged anticompetitive effects against the proffered procompetitive benefits.[31] However, a few categories of

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[28] *In re Flat Glass Antitrust Litig.*, 385 F.3d at 357 (quoting *Monsanto Co. v. Spray–Rite Serv. Corp.*, 465 U.S. 752, 764 (1984)) (citation modified).

[29] *In re Processed Egg Prods. Antitrust Litig.*, 962 F.3d 719, 726 (3d Cir. 2020); *InterVest, Inc. v. Bloomberg, L.P.*, 340 F.3d 144, 159 (3d Cir. 2003).

[30] *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 315 (citation modified).

[31] *See InterVest*, 340 F.3d at 159; *see also Leegin Creative Leather Prods., Inc. v. PSKS, Inc.*, 551 U.S. 877, 886 (2007) ("In its design and function the rule [of reason] distinguishes between restraints with anticompetitive effect that are harmful

restraints are said to be so manifestly anticompetitive that they are "conclusively presumed to unreasonably restrain competition."[32] These agreements are deemed as a matter of law *per se* illegal, because they almost always tend to restrict competition and decrease output.[33] "Paradigmatic examples [of *per se* illegal restraints] are 'horizontal agreements among competitors to fix prices or to divide markets.'"[34] Horizontal agreements between competitors form a key part of what has been dubbed a "hub-and-spoke" conspiracy, a form of conspiracy analogized to the shape of a wheel.[35] Such a conspiracy involves a hub at the center, usually an agent, supplier, or purchaser with whom all the competitors, the spokes, have a relationship.[36] Establishing a *per se* violation with the hub-and-spoke model requires showing that the spokes are connected to each other via a horizontal agreement.[37] This horizontal agreement connecting the competitors is the "rim" of the wheel.[38]

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to the consumer and restraints stimulating competition that are in the consumer's best interest.").

[32] *In re Flat Glass Antitrust Litig.*, 385 F.3d at 356 (citation modified).

[33] *See In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 316.

[34] *Id.* (quoting *Leegin,* 551 U.S. at 886).

[35] *See Howard Hess Dental Lab'ys. Inc. v. Dentsply Int'l, Inc.*, 602 F.3d 237, 255 (3d Cir. 2010).

[36] *See id.*

[37] *See In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 327 (quoting *Total Benefits Planning Agency, Inc. v. Anthem Blue Cross & Blue Shield*, 552 F.3d 430, 436 (6th Cir. 2008)).

[38] *Dentsply Int'l*, 602 F.3d at 255.

To state a claim of horizontal agreement under the Sherman Act with circumstantial evidence, plaintiffs must plead "something more than merely parallel [conduct]" among the defendants.[39] This is because parallel conduct may occur without any coordination and result merely from each competitor independently working to gain a competitive advantage or maximize its market position.[40] Accordingly, plaintiffs alleging an illegal conspiracy to restrain trade based on circumstantial evidence must also allege that certain "plus factors" exist beyond the mere fact of parallel conduct.[41] We have identified at least three types of "plus factors" that "tend to demonstrate the existence of an agreement: '(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.'"[42] These are not exhaustive, as many antitrust

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[39] *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 322 (quoting *Bell Atl. Corp. v. Twombly*, 550 U.S. 544, 560 (2007)).

[40] *See id.* at 321–22.

[41] *In re Chocolate Confectionary Antitrust Litig*., 801 F.3d 383, 398 (3d Cir. 2015); *see also In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 321 (collecting cases demonstrating the principle that "evidence of parallel conduct by alleged co-conspirators is not sufficient to show an agreement"); *In re Flat Glass Antitrust Litig.*, 385 F.3d at 360 n.11.

[42] *Burtch*, 662 F.3d at 227 (quoting *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 321–22). In this context, conduct contrary to the defendant's interests means "conduct that would be irrational assuming that the defendant operated in a

claims arise in unique contexts and market conditions. This is particularly true given the evolving complexity and sophistication of the technology that has become integral to today's marketplace.

"The main threat of horizontal agreements is that they can enable participants collectively to reduce the output of goods in some market, thus causing higher prices, inefficient substitutions, and the resultant losses in consumer or labor welfare."[43] In a competitive market, the presence of many firms competing for market can make such agreements impractical.[44] And "[f]irms that seek to [coordinate prices] through the conscious parallelism of oligopoly must rely on uncertain and ambiguous signals to achieve concerted action."[45] However, AI-enabled algorithms are capable of solving these problems while simultaneously evading traditional detection methods.[46] AI software can facilitate collusion by enabling competitors to coordinate prices and share information without ever communicating with each other. And real-time price monitoring enables cartels to more effectively police each other's pricing behavior and adjust

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competitive market." *See In re Flat Glass Antitrust Litig.*, 385 F.3d at 360–61.

[43] Phillip E. Areeda & Herbert Hovenkamp, *Antitrust Law: An Analysis of Antitrust Principles and Their Application* ¶ 1902, Wolters Kluwer (updated Sept. 2025).

[44] *See In re Chocolate Confectionary Antitrust Litig.*, 801 F.3d at 397.

[45] *Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. 209, 227 (1993).

[46] *See generally* Brief of American Antitrust Institute as Amicus Curiae Supporting Appellants, at 12–15.

accordingly. Our review of Plaintiffs' Section 1 claims must proceed against this background.

B. Standard of Review

Whether Plaintiffs have stated a claim upon which relief can be granted is a question of law. Accordingly, "[w]e exercise plenary review of the District Court's order[] granting [D]efendants' motion to dismiss under Federal Rule of Civil Procedure 12(b)(6)."[47] To state a claim, "a complaint must contain factual allegations that, taken as a whole, render the plaintiff's entitlement to relief plausible."[48] The plausibility standard at the pleading stage is not a "probability requirement."[49] It simply requires the reviewing court to determine whether a complaint which pleads a Section 1 claim includes sufficient factual allegations "to raise a reasonable expectation that discovery will reveal evidence of [an] illegal agreement."[50] In reviewing the complaint, we take the well-pleaded allegations to be true, and we construe them in the light most favorable to plaintiffs.[51] *Twombly* recognized that although antitrust cases can be complex and expensive, we

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[47] *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 314.
[48] *W. Penn Allegheny Health Sys., Inc. v. UPMC*, 627 F.3d 85, 98 (3d Cir. 2010).
[49] *Id.* (quoting *Phillips v. Cnty. of Allegheny*, 515 F.3d 224, 234 (3d Cir. 2008)); *Twombly*, 550 U.S. at 556.
[50] *Twombly*, 550 U.S. at 556; *see also W. Penn Allegheny Health Sys., Inc.*, 627 F.3d at 98 (citing *Phillips*, 515 F.3d at 234).
[51] *See W. Penn Allegheny Health Sys., Inc.*, 627 F.3d at 91.

must not require heightened fact pleading.[52] Rather, we review the well-pleaded allegations "in light of common economic experience."[53] This is a "context-specific task" that requires us to draw on our judicial experience and common sense in assessing the totality of the circumstances.[54]

C. The Consolidated Amended Complaint (CAC)[55]

This putative class action is a consolidation of three similar cases with identical price-fixing claims filed before the District Court. Plaintiffs are consumers who directly rented

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[52] *See Twombly*, 550 U.S. at 558, 570. Following the Supreme Court's decisions on fact pleading in *Twombly* and *Ashcroft v. Iqbal*, 556 U.S. 662, 663 (2009), we repeatedly affirmed that notice pleading still applies in antitrust cases. *See, e.g.*, *W. Penn Allegheny Health System, Inc.*, 627 F.3d at 98 (noting that Rule 8's pleading standard applies with the same level of rigor in all civil actions); *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 320 (noting that *Twombly* is "an essential guide to the application of [the notice pleading] standard in the antitrust context").

[53] *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 325 (quoting *Twombly*, 550 U.S. at 565).

[54] *Iqbal*, 556 U.S. at 679; *see also In re Flat Glass Antitrust Litig.*, 385 F.3d at 369 ("A court must look to the evidence as a whole and consider any single piece of evidence in the context of other evidence.").

[55] The facts herein are taken from the CAC, accepted as true, and viewed in the light most favorable to the Plaintiff-Appellants. *See Doe v. Princeton Univ.*, 30 F.4th 335, 340 (3d Cir. 2022).

guest rooms from the Defendant casino-hotels, allegedly at anticompetitively high prices, during a period which began no later than June 28, 2018, to the present (the "class period"). They allege that, although the casino-hotels started using Rainmaker products[56] at various times preceding the class period (as early as 2004 and as recently as 2018), all of them were using Rainmaker's prescriptive algorithm for their pricing decisions by the start of the class period.[57] Rainmaker allegedly acts as an exchange hub and a shared pricing agent for the casino-hotels. Plaintiffs allege that the "products comprising the Rainmaker pricing algorithm platform—GuestREV, REVCaster, and GroupREV—enable casino-hotel clients to achieve higher rates and profits on guest rooms" by forecasting market demand for individual and large group bookings and recommending to each client the optimal price

[56] In 2019, Cendyn acquired Rainmaker, which includes a suite of dynamic pricing software programs. *See* App. 238–39.

[57] At oral argument, Plaintiffs stated that the dynamic pricing algorithm program at the center of their Complaint was actually "not available to [Casino-Hotel defendants] until at least 2009 or 2010." Oral Argument Tr. at 47. This newly-raised fact, however, does not appear in either the CAC or the district court record, and thus, we do not consider it in our analysis. *See In re Cap. Cities/ABC, Inc.'s Application for Access to Sealed Transcripts*, 913 F.2d 89, 96 (3d Cir. 1990) ("This Court has said on numerous occasions that it cannot consider material on appeal that is outside of the district court record.").

rate to charge.[58] According to Plaintiffs, the process works like this:

> Rainmaker's software is installed directly into casino-hotels' on-site room pricing and occupancy data systems, such that each casino-hotel client provides its current, non-public room pricing and occupancy data to the Rainmaker platform on a continuous basis. In turn, the algorithm continuously processes and analyzes this non-public, real-time information, along with the same type of non-public, real-time data the client's participating competitors also submit to the platform, and other relevant supply and demand-related data. The algorithm utilizes this continuous flow of real-time data to obtain a clear and complete picture of market supply and demand and competitive dynamics at any given time. The algorithm ultimately uses this information to generate "optimal" room rates, updated multiple times per day, for each client to charge guests.[59]

Since the software is allegedly "integrated directly into a casino-hotel's property management system," the pricing recommendations generated by the algorithm are "directly and

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[58] App. 212 (CAC ¶ 7). However, Plaintiffs concede in their Opening Brief that REVCaster, a "price-comparison tool" described in the CAC as driven by its clients to monitor rate parity and solve for competitive rate shopping by guests, *see* App. 248-50 (CAC ¶¶ 159, 165), was discontinued in January 2019. Appellants' Opening Br. at 18 n.5.

[59] App. 212 (CAC ¶ 6).

automatically uploaded into the casino-hotel's system."[60] It is undisputed among the parties that the casino-hotels retain final pricing authority and may choose to change the algorithm's suggested prices. However, Plaintiffs allege that Cendyn constrains the casino-hotels' ability to do so by requiring a special override to be used only in times of "need and extreme circumstances" and by scoring each casino-hotel on how often it overrides the algorithm's price and forecast recommendation.[61] The Defendant casino-hotels are alleged to accept Cendyn's recommendations 90 percent of the time, resulting in the alleged anticompetitive guest room rates in Atlantic City during the class period.

Cendyn allegedly "conveyed [to the casino-hotel Defendants] that uniform adoption would enable their access, under the auspices of a single shared algorithm, to one another's real-time, non-public pricing and occupancy data, [and] that the Rainmaker platform[] . . . would generate significantly higher prices for each [casino-hotel Defendant] than if each one did so independently without use of that platform."[62]

The CAC also purports to describe the structural features of the Atlantic City casino-hotels market and the financial difficulties faced by casino-hotels in this market in the years preceding the class period. Plaintiffs posit that Defendants had the motive to conspire to fix prices and that Rainmaker provided the opportunity to do so. They allege that "[s]tarting in mid-2018 . . . [the] Casino-Hotel Defendants . . .

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[60] App. 241 (CAC ¶ 137).
[61] App. 241–42 (CAC ¶¶ 138–39).
[62] App. 269 (CAC ¶ 220).

collectively had market power and incentive to recoup years of losses."[63] The CAC includes aggregate statistics from Atlantic City casino-hotel market reports suggesting that during the class period, casino-hotels' guest room rates and corresponding revenue significantly increased in parallel as room occupancy levels decreased.[64] For example, between 2017 and 2019—before the COVID-19 pandemic temporarily shut down hotels in 2020—casino-hotel Defendants' collective room occupancy allegedly began to trend downward with an 8 percent decrease in occupancy, while their room revenue began to trend upward with about a 22 percent increase in room revenue.[65] And in 2022, the casino-hotels are alleged to have collectively rented 5 percent fewer rooms but charged 25 percent more for those rooms as compared to data from 2019.[66] Accordingly, Plaintiffs allege that this parallel conduct during the class period, and other "plus" factors, like the purported exchange of non-public information through Cendyn's algorithm, constitute circumstantial evidence of a horizontal price-fixing agreement.

D. Defendants' 12(b)(6) Motion and District Court's Order Granting Motion

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[63] App. 270 (CAC ¶ 222).

[64] *See* App. 285 (CAC ¶ 242–45) (citing data from the New Jersey Division of Gaming Enforcement and the New Jersey Casino Control Commission showing each casino-hotel Defendant's occupancy rate and average daily room rate between 2015 and 2022).

[65] App. 285–86 (CAC ¶ 243).

[66] App. 285 (CAC ¶ 242).

Defendants moved to dismiss the Complaint for failure to state a claim under Federal Rule of Civil Procedure 12(b)(6). The District Court granted the motion to dismiss, reasoning that the CAC contained several factual deficiencies and did not establish a plausible price-fixing agreement among the casino-hotel Defendants.[67] The District Court understood Plaintiffs' allegations of collusion to be premised merely on the casino-hotel Defendants' "knowing" and "purposeful" use of the Rainmaker products.[68] It found that the CAC was substantially similar to a complaint from an action in the District of Nevada which was dismissed because its allegations of a horizontal agreement did not "cross[] the line from conceivable to plausible."[69] Among many factors the Court determined to be fatally insufficient, it noted that the parallel conduct pled was not parallel because the casino-hotel Defendants signed up to use Rainmaker over a fourteen-year period.[70] It also found that Plaintiffs did not adequately show how Cendyn used the data it received from the casino-hotels—namely that the CAC did not allege that the information was "pooled or otherwise commingled" or somehow improperly exchanged —and that the casino-hotel Defendants continued to retain and exercise pricing authority.[71] Accordingly, the District Court concluded

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[67] *Cornish-Adebiyi v. Caesars Ent., Inc.*, No. 1:23-CV-02536-KMW-EAP, 2024 WL 4356188, at *4–5 (D.N.J. Sept. 30, 2024).
[68] *Id.* at *5.
[69] *See Gibson v. Cendyn Grp., LLC*, No. 2:23-CV-00140, 2024 WL 2060260, at *3 (D. Nev. May 8, 2024), *aff'd*, 148 F.4th 1069 (9th Cir. 2025), *cert. denied,* No. 25-1109, 2026 WL 1052046 (U.S. Apr. 20, 2026).
[70] *Cornish-Adebiyi*, 2024 WL 4356188, at *5.
[71] *Id*.

that these factors militated against finding an agreement among the Defendants such that the conspiracy Plaintiffs allege fatally "lacks a rim."[72] We disagree with the District Court.

The CAC contains many allegations that, taken together as true, lead to a plausible inference that Defendants have agreed to fix their room rates through Cendyn's dynamic pricing algorithm and thereby inflate room rates and avoid competing. Moreover, and quite significantly, Plaintiffs allege that even when it would have been in the casino-hotels' economic interests to reduce room rates to increase occupancy so as to capture more guests and thereby generate more casino revenue when occupancy was declining, the casino-hotels overwhelmingly adhered to Cendyn's price recommendation. Even more significantly, the CAC alleges that Cendyn's former Vice President of Data Science and Analytics (who also served as Rainmaker's Vice President of Revenue Analytics) encouraged casino-hotels to "avoid the infamous 'race to the bottom' when competition inevitably becomes fierce within a market."[73] Cendyn is also alleged to have "led discussions involving industry executives and managers, including personnel from [c]asino-[h]otel Defendants, on the best practices for maximizing room revenue and profitability *while avoiding price wars*, *including through use of the Rainmaker platform*."[74] But of course, that is just one way of indicating that Rainmaker could help the casino-hotel Defendants avoid having to lower prices to compete with one another. Thus, the

[72] *Id.* at *7.
[73] App. 252 (CAC ¶ 173) (quoting comment from May 2020 hospitality industry publication).
[74] App. 323 (CAC ¶ 360) (emphasis added).

District Court erred in failing to appreciate or recognize the nature of the conspiracy alleged by Plaintiffs.

IV.

A. Circumstantial Evidence of Defendants' Horizontal Agreement

Plaintiffs' Complaint relies primarily on circumstantial evidence to state a claim of collusion. Accordingly, Plaintiffs must sufficiently allege parallel conduct and plus factors.[75]

1. Parallel Conduct

Plaintiffs' two theories of parallel conduct include allegations of Defendant casino-hotels' (1) contemporaneous use of Cendyn's software and (2) synchronous price and output movement during the class period. First, Plaintiffs allege that at some point between 2004 and 2018, each of the casino-hotel Defendants adopted Rainmaker and "knowing[ly] and purposeful[ly]" used it to set prices.[76] In doing so, the casino-hotel Defendants allegedly gave Rainmaker not only information that was generally available to the public but also proprietary information knowing that competitors would benefit from it. Cendyn's dynamic pricing algorithm therefore functioned as a "shared pricing agent" for defendants and "generate[d] recommended room rates for each of them using non-public pricing and occupancy data shared by each casino-hotel Defendant with the platform in real-time."[77] A key

[75] *In re Ins. Brokerage*, 618 F.3d at 323.
[76] App. 210 (CAC ¶ 1).
[77] App. 212–13 (CAC ¶ 9).

allegation is that during the relevant class period, all of the casino-hotel Defendants were delegating their pricing decisions to Cendyn by accepting Rainmaker's pricing recommendations 90% of the time. This alleged parallel behavior among casino-hotel Defendants after 2017 purportedly replaced a "historically independent room pricing system" with an "interdependent, collusive one."[78] The anticompetitive effects are alleged to be consistently higher room rates despite declining occupancy, and this resulting anticompetitive upward pressure on the price of hotel rooms during the class period is clearly alleged in the CAC. Cendyn purportedly relied on the resulting higher room rates to show how its software product kept revenue high despite the downward pressure that would otherwise have resulted in lowering room rates.

Plaintiffs also point to the alleged synchrony of "pricing and occupancy rate movement [among the casino-hotels] during the class period," for which the CAC includes numerous data points in support.[79] Relying on data from the New Jersey Division of Gaming Enforcement, plaintiffs include graphs indicating that after 2017, the year preceding the class period, there is sudden upward trend in casino-hotel Defendants' average daily room rates.[80] The graphs indicate that by 2019,

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[78] App. 214 (CAC ¶ 13).

[79] Appellants' Opening Br. at 43; *see also* App. 287–91 (CAC ¶¶ 245–249).

[80] The exception was Hard Rock Atlantic City, which was newly opened in 2018, and so there is no pre-2018 data for comparison. There is also no discernible trend in Hard Rock's prices during the class period, and its occupancy rates mostly trended upward during this time. *See* App. 288 (CAC ¶ 245).

room rates had increased by an additional $15 to $60.[81] Meanwhile, occupancy rates for all the casino-hotel Defendants (except for Hard Rock) "meaningfully decreased" during this time.[82] The graphs purport to show that this downward trend in room occupancy began even before the outlier year of 2020 when the COVID-19 pandemic and subsequent lockdown forced the temporary closure of many businesses.[83] According to Plaintiffs, "economic principles should have compelled at least some Casino-Hotel Defendants to drop room rates in order to compete," especially in the casino-hotel business where greater occupancy is likely to result in greater overall revenue from the additional guests who would patronize the casino and other entertainment facilities.[84] However, according to the CAC, casino-hotel defendants did not reduce room pricing.

The alleged contemporaneous use of Cendyn's software and the synchrony of the casino-hotels' alleged upward pricing and downward room occupancy—a large departure from their traditional practice and under economic circumstances that should typically lead to competitive price-cutting—are sufficient to show conscious parallel conduct.[85]

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[81] Room rates increased by an additional $14.77 at Bally's Atlantic City and by an additional $60.46 at Tropicana Ocean City. *See* App. 288 (CAC ¶ 245).
[82] App. 291 (CAC ¶ 249).
[83] *See* App. 289-90 (CAC ¶ 247).
[84] App. 291 (CAC ¶ 250).
[85] We need not decide whether they are independently sufficient because they are, at least, sufficient in combination.

Defendants ask us to find otherwise, partly because of allegations that the casino-hotels adopted the software programs at various points within a fourteen-year period. They also point to the fact that the alleged period of collusion here is "over 50 times longer than the three-month gap in *Burtch* [*v. Milberg Factors, Inc.*, 662 F.3d 212, 221 (3d Cir. 2011)]," which we held to be insufficiently parallel.[86] In *Burtch*, we found that business decisions made by defendant-financiers at various points between March 13, 2002, and September 15, 2003, to allegedly end their business relationship with the plaintiff was not sufficiently parallel to sustain a claim of conspiracy.[87] The conduct in question was the financiers' decisions regarding the plaintiff's requests for a credit line. The *Burtch* complaint alleged that, during the relevant period, some defendants declined those credit requests altogether, others decreased the existing credit line, and others even increased credit to the plaintiff.[88] Thus, each of the defendants there took very different approaches toward the plaintiff at various points during the relevant time period.[89]

Burtch does not support Defendants' argument, because here, the alleged relevant conduct is (1) the casino-hotels' "continu[ous] deployment" of Cendyn's pricing agent and continuous delegation of pricing to the software, and (2) the subsequent, sudden synchronous movement of prices and output (i.e. hotel room occupancy).[90] The CAC does not allege that the conspiracy began with the adoption of Cendyn's

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[86] Appellees Resp. Br. at 27 (citing *Burtch*, 662 F.3d at 228).
[87] *See Burtch*, 662 F.3d at 228.
[88] *Id.*
[89] *See id.*
[90] Appellants' Opening Br. at 42.

software, but instead relies upon the continuous parallel conduct of the casino-hotels during the relevant period of the alleged conspiracy. [91] Nonetheless, because parallel conduct alone cannot sustain a claim of horizontal price-fixing, we also consider Plaintiffs' allegations of additional "plus" factors.[92]

2. "Plus" Factors

Plaintiffs allege several other "plus" factors which further support an inference of collusion. In the CAC, Plaintiffs allege (1) that Defendants had motive to conspire because of

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[91] Moreover, it is important to note that because AI-driven tools can adapt and adjust based on new data, collusive conduct may occur at later points in time when other competitors begin to share their non-public commercial data with the software. Thus, the fact that the casino-hotel Defendants adopted the software at various times may well be irrelevant, or relevant only to the weight of the evidence of a conspiracy, not to its existence. The advancements in artificial intelligence over the past fourteen years further support the inference that the opportune time and capability for collusion could have arisen later in time irrespective of when the casino-hotel Defendants adopted the software. *See* Brief for American Antitrust Institute as Amicus Curiae Supporting Appellants at 19.

[92] *See Twombly*, 550 U.S. at 554; *see also In re Baby Food Antitrust Litig.*, 166 F.3d at 122 ("Because the evidence of conscious parallelism is circumstantial in nature, courts are concerned that they do not punish unilateral, independent conduct of competitors . . . They therefore require that evidence of a defendant's parallel pricing be supplemented with plus factors.") (citation modified).

"an extended period of financial hardship in the years [preceding] the class period;" (2) that the casino-hotel Defendants' adoption of Cendyn's price recommendations when they could have competed more aggressively on price was against their economic interests; and (3) non-economic evidence showing exchange of non-public commercial information, opportunities to collude, and sudden changes in longstanding business practices.[93]

Plaintiffs allege that Defendants' incentive to conspire stems from the financial hardship the casino-hotel market experienced due to high debt levels and depressed cash flows for many years following the 2008 recession. The CAC suggests that the structural features of the Atlantic City casino-hotel market—high barriers to entry, lack of reasonable substitutes, and the high market concentration—are conducive to collusion and contributed to the casino-hotels' motive.

The CAC also alleges that the failure of at least some Defendants to undercut each other's prices during the class period was against their individual economic self-interest in the absence of collusion.

In *Lifewatch Services Inc. v. Highmark*, we noted that when the market in question is alleged to be an oligopoly, that is, a highly concentrated market comprised of few dominant firms with fungible products, the first two categories of "plus" factors, motive to conspire and actions against self-interest, may simply be attributed to market transparency and not

[93] App. 304-310.

necessarily to collusive conduct.[94] This is because it is easy for competitors to monitor and be influenced by each other's behavior in oligopolistic markets.[95] Sellers in such markets might be hesitant to undercut each other's prices as competitors can easily notice and reciprocate by reducing their own prices.[96] Thus, we said in *Valspar Corporation v. E.I. Du Pont*

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[94] 902 F.3d 323, 333 (3d Cir. 2018) (quoting *Valspar Corp. v. E.I. Du Pont De Nemours & Co.*, 873 F.3d 185, 193 (3d Cir. 2017)) (noting that in oligopolistic markets, the first two plus factors tend to reflect conscious parallelism and "largely restate [the] phenomenon of interdependence" among the few firms in the market); *In re Flat Glass Antitrust Litig.*, 385 F.3d at 360. This is not to say that oligopolies do not benefit from concerted action; the same issues of uncertainty that plague other markets affect oligopolies. *See Brooke Grp. Ltd. v. Brown & Williamson Tobacco Corp.*, 509 U.S. at 227–28 (explaining that even in a disciplined oligopoly, "signals are subject to misinterpretation and are a blunt and imprecise means of ensuring smooth cooperation").

[95] *See In re Flat Glass Antitrust Litig.*, 385 F.3d at 359.

[96] *Id.* ("[F]irms 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."); *see also In re Text Messaging Antitrust Litig.*, 782 F.3d 867, 874-75 (7th Cir. 2015); *Blomkest Fertilizer, Inc. v. Potash Corp. of Saskatchewan*, 203 F.3d 1028, 1041–42 (8th Cir. 2000) (Gibson, J., dissenting) ("The other oligopolists know that if they keep their prices low, the brave price leader will simply cut his prices and the battle will resume. On the other hand, if they raise their prices in turn, all sellers will receive higher prices and end up with more money in their pockets. The loser will be the consumer, who benefits from competition,

De Nemours and Company, that evidence that "the market was primed for anticompetitive interdependence" may do nothing more than describe the market characteristics in some cases.[97] However, "certain types of 'actions against self[-]interest' may do more than restate economic interdependence" even in alleged oligopolistic markets.[98] And here, more is alleged.

In this unique context of casino-hotels, the allegation that the casino-hotel Defendants agreed not to compete on room rates is significant. As we have discussed, if hotel rooms allegedly draw more guests into the casino facilities, casino-hotels "have even more incentive than [standard] hotels to fill their hotels to capacity" as they may obtain "more income from the rental of their rooms . . . [and a] greater amount of revenue from their casinos."[99] Taken as true, economic principles state that a casino-hotel whose room occupancy is steadily decreasing over the years would lower room rates in order to compete for more hotel guests who will then be available to venture into the casino. Moreover, common sense suggests as much.[100] But, this might spur competition and create

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not peaceful coexistence between suppliers." (citation omitted)). *See generally* Phillip E. Areeda & Herbert Hovenkamp, *Antitrust Law: An Analysis of Antitrust Principles and Their Application* ¶ 404, Wolters Kluwer (updated Sept. 2025) (discussing oligopolies).

[97] 873 F.3d 185, 197 (3d Cir. 2017).

[98] *In re Flat Glass Antitrust Litig.*, 385 F.3d at 361 n.12.

[99] App. 307 (CAC ¶ 308).

[100] *Cf.* N.J. CASINO CONTROL COMM'N., 2019 ANNUAL REPORT OF THE NEW JERSEY CASINO CONTROL COMMISSION 47 (2017), https://www.nj.gov/casinos/about/reports/pdf/2017_ccc_annu

downward price pressure thus resulting in the very "race to the bottom" that Cendyn's former executive allegedly cautioned hotels to avoid.[101] Accordingly, the alleged scheme would only work if casino-hotels could maintain higher room prices knowing that other casino-hotels would not reduce their rates to compete for the pool of potential hotel guests. This certainly supports an inference of collusion; indeed, we can think of no other explanation.

Plaintiffs also allege evidence of a traditional conspiracy, which we have described as "non-economic evidence that there was an actual, manifest agreement not to compete" such as "proof that the defendants got together and exchanged assurances of common action or otherwise adopted a common plan even though no meetings, conversations, or

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al_report.pdf [https://perma.cc/252E-M6BB] (showing that casino revenue contributed about 72% of total revenue while rooms make up only 11%) *with* N.J. CASINO CONTROL COMM'N., 2019 ANNUAL REPORT OF THE NEW JERSEY CASINO CONTROL COMMISSION 53 (2019), https://www.nj.gov/casinos/about/reports/pdf/2019_ccc_annual_report.pdf [https://perma.cc/6SLZ-CX3C] (showing that casino revenue contributed to about 55% of the industry total revenue, while rooms contributed only about 19%) *and* N.J. CASINO CONTROL COMM'N., 2022 ANNUAL REPORT OF THE NEW JERSEY CASINO CONTROL COMMISSION 59 (2022), https://www.nj.gov/casinos/about/reports/pdf/2022_ccc_annual_report.pdf [https://perma.cc/R7U5-JSRA] (showing about the same).

[101] *See* App. 252 (CAC ¶ 173).

exchanged documents are shown."[102] Plaintiffs allege, among other things, de facto data exchanges through the software, opportunities for the Defendants to conspire at various industry events, knowledge of each other's relationship with Cendyn through publications and events, and the sudden change in the casino-hotels' business practices.

The CAC alleges that the casino-hotel Defendants mutually used the Cendyn pricing software as a means to exchange non-public proprietary information and that these information exchanges directly impacted their pricing decisions. Of course, information exchanges among competitors are not *per se* illegal. They are, however, "a facilitating practice that can help support an inference of a price-fixing agreement."[103]

The District Court held that "Plaintiffs' 'failure to plausibly allege the exchange of confidential information from one of the spokes to the other through the hub's algorithm is [a] fatal defect . . . [and it] compels the conclusion that there is

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[102] *In re Ins. Brokerage Antitrust Litig.*, 618 F.3d at 322 (citation modified).

[103] *Todd v. Exxon Corp.*, 275 F.3d 191, 198 (2d Cir. 2001); *see also United States v. U.S. Gypsum Co.*, 438 U.S. 422, 441 n.16 (1978) ("The exchange of price data and other information among competitors [is not a *per se* violation]; . . . 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.").

no rim [in the alleged hub-and-spoke conspiracy].'"[104] But, there are numerous paragraphs in the CAC that plausibly make such allegations in the context of AI-driven dynamic pricing.[105] The CAC alleges that each casino-hotel knew and "understood" that "the recommended room rates they were receiving from [Cendyn's software] were based on real-time, non-public pricing and occupancy data [that] they and their co-defendants all were providing to the platform."[106] It is further alleged that they "understood that their co-defendants also knew that the recommended room rates they each were receiving from [Cendyn's software] were based on real-time, non-public pricing and occupancy data [that] they and their co-defendants were all providing to the platform."[107] The CAC adequately alleges that the casino-hotels understood that each of them was committed to a common plan of setting room rates based on the recommended rates received from Cendyn's software, the hub for their collective data, while also "knowing that their competitors would not lower their room rates to take market share."[108]

The District Court required plaintiffs to plead with more specificity how the algorithm functions to facilitate the exchange of information.[109] This is tantamount to expecting Plaintiffs to explain how Cendyn's proprietary software works

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[104] *Cornish-Adebiyi*, 2024 WL 4356188, at *7 (quoting *Gibson*, 2024 WL 2060260, at *4).
[105] *See, e.g.*, App. 212, 241, 264, 269, 270-73 (CAC ¶¶ 6, 136, 205, 220, and 224-28).
[106] App. 271-72 (CAC ¶ 226).
[107] *Id*.
[108] App. 215 (CAC ¶ 17).
[109] *See Cornish-Adebiyi*, 2024 WL 4356188, at *4.

without affording the discovery required to do that. Moreover, at this stage of litigation, such level of detail into the software's operations is neither required nor appropriate.[110] Thus, at this stage, Plaintiffs have sufficiently alleged that a material exchange is likely occurring and facilitating collusion.

Defendants also argue that because each casino-hotel retained final pricing authority and could override Cendyn's price recommendation, Plaintiffs have not sufficiently shown that the casino-hotels enforced their agreement by delegating their respective pricing decisions to Cendyn. However, "[p]rices are fixed when they are agreed upon," irrespective of whether conspirators always adhere to them.[111] Although an antitrust plaintiff's allegations may well fail if the alleged colluders routinely varied from recommended prices, that is not what is alleged here. The alleged 90 percent compliance rate certainly supports an inference of an agreement between casino-hotel defendants to price rooms consistent with Cendyn's suggestions. This is especially true given the alleged practical difficulties of deviating from Cendyn's rates, such as requiring "override permissions" accessible to select staff at each casino-hotel.[112] Moreover, as we have explained, dynamic pricing algorithms tend to rely on the collective input

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[110] Sherman Act jurisprudence "eschew[s] . . . formalistic distinctions in favor of a functional consideration of how the parties involved in the alleged anticompetitive conduct actually operate." *Am. Needle, Inc. v. Nat'l Football League*, 560 U.S. 183, 191 (2010).

[111] *United States v. Masonite Corp.*, 316 U.S. 265, 276 (1942) (citing *United States v. Socony-Vacuum Oil Co.*, 310 U.S. 150, 222 (1940)).

[112] App. 241–42 (CAC ¶ 138–39).

of data to draw patterns and make suggestions. This, coupled with the well-pleaded allegations in the Complaint, further supports an inference that information exchanges have resulted in collusive pricing and diminished competition.

To be clear, we do not make any assumptions or conclusions about how Cendyn's dynamic pricing software works. We only conclude that, taking Plaintiffs' allegations as true, the software is, in effect, facilitating collusive conduct by receiving from each client non-public commercial information, and in return, giving each client the benefit of their competitors' non-public data in formulating a price recommendation which Defendants purportedly agreed to comply with.[113] Such exchanges involving current pricing and

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[113] *See In re Domestic Airline Travel Antitrust Litig.*, 691 F. Supp. 3d 175, 208 (D.D.C. 2023) (*quoting In re Domestic Drywall Antitrust Litigation*, 163 F. Supp. 3d 175, 241 n.49 (E.D. Pa. 2016)) ("A 'facilitating practice' is 'an activity that makes it easier for parties to coordinate pricing or their behavior in an anticompetitive way [and] increases the likelihood of a consequence offensive to antitrust policy." (alteration in original)).
Whether Cendyn's software operates as a hub, a facilitating practice, an intermediary, or a conduit, to the extent it is plausibly alleged to be facilitating a horizontal agreement among some of its clientele, it crosses the line into impermissible conduct per our Sherman Act jurisprudence. *See also Socony-Vacuum Oil Co.*, 310 U.S. at 223 ("[M]arket manipulation in its various manifestations is implicitly an artificial stimulus applied to (or at times a brake on) market prices, a force which distorts those prices, a factor which

occupancy data have great potential for anticompetitive collusion.[114] While there are independent business reasons to use dynamic pricing software, there are rarely legitimate business justifications for affording competitors the benefit of commercially sensitive proprietary information under the circumstances alleged here.

V.

In conclusion, we find that the District Court gave inadequate consideration to the allegations in the CAC in context with the complexity and novelty of dynamic pricing algorithms. Nevertheless, the point made by amicus curiae International Center for Law & Economics (ICLE) cautioning us to avoid criminalizing industry-wide use of the same algorithmic software is well taken. They ask, "[i]f multiple gas stations use Excel spreadsheets with the same pricing formulas, is that an antitrust violation? If retailers use the same market research firm's pricing surveys, have they joined a hub-and-

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prevents the determination of those prices by free competition alone.").

[114] *See* Antitrust L. & Econ. Prof. Amicus Br. at 18 (quoting *United States v. U.S. Gypsum Co.*, 438 U.S. 422, 443 (1978)) (cautioning that such exchanges have the "greatest potential for generating anticompetitive effects"); *see also* William E. Kovacic, et al., *Plus Factors and Agreement in Antitrust Law*, 110 MICH. L. REV. 393, 424 (2011) (identifying information conveyances among competitors as a "super plus factor")); *Valspar Corp.*, 873 F.3d at 197 n.8 (noting that unilateral exchanges of confidential price information is "one example of an action against self-interest that may not simply be a result of interdependence").

spoke conspiracy? If manufacturers rely on the same forecasting software to set production levels, are they unlawfully coordinating output?"[115] But these questions oversimplify the issues and ignore many of the specific allegations in the CAC that are unique to this litigation. The allegations here imply more than using identical spreadsheets or pricing formulas without colluding on the prices that will be charged as a result.

The CAC involves many more factors that go beyond merely using the same independently-operated software to set production levels. For example, it alleges an exchange of non-public commercial information from the spokes that is consolidated in the hub and then shared back to the spokes in the form of price recommendations which automatically determine room rates under circumstances where each spoke is confident that the resulting rate will not be undercut by the competing spokes. Far from ICLE's proffered examples of software programs used separately and independently to help businesses compete against one another, Rainmaker is alleged to operate as a *single* decision-maker or hub, coordinating pricing for a majority of the market.

Some researchers also caution that existing antitrust jurisprudence may not be fully equipped to tackle future developments in technology and the new issues that may subsequently arise.[116] We do not disagree. As we noted at the

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[115] Brief of International Center for Law & Economics as Amicus Curiae Supporting Appellees at 17.

[116] *See, e.g.*, Ai Deng, *Algorithmic Collusion and Algorithmic Compliance: Risks and Opportunities*, 27 GLOB. ANTITRUST INST. REP. ON DIGIT. ECON. 964, 970 (2020) ("The antitrust

outset, Section 1 of the Sherman Act was enacted well over a century ago in 1890. Nevertheless, the goal of our antitrust jurisprudence remains the same: to ensure the continued existence of "independent centers of decision-making."[117]

As former acting chair of the U.S. Federal Trade Commission, Maureen K. Ohlhausen, inquired:

> "Is it ok for a guy named Bob to collect confidential price strategy information from all the participants in a market, and then tell everybody how they should price? If it isn't ok for a guy named Bob to do it, then it probably isn't ok for an algorithm to do it either."[118]

If Cendyn's algorithm is in effect collecting non-public commercial information from defendants and utilizing the collective pot of data to "suggest" prices to each, under the circumstances alleged here, plaintiffs have surely raised a plausible inference of collusion under Section 1 of the Sherman Act even though the alleged hub is named "Rainmaker" rather

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community is largely playing catch-up on the technical aspects of AI and machine learning."); Michal S. Gal & Niva Elkin-Koren, *Algorithmic Consumers*, 30 HARV. J. L. & TECH. 309, 347 (2017) (cautioning that the functions of algorithms may evade antitrust scrutiny).

[117] *Copperweld v. Indep. Tube Corp.*, 467 U.S. 752, 769 (1984) (citation modified).

[118] Ohlhausen, *supra* note 22, at 10.

than "Bob."[119] Accordingly, we will reverse and remand for further proceedings in accordance with this Opinion.[120]

[119] Of course, at the next stage of litigation, plaintiffs will face a higher burden to sustain their claims by further developing the facts of the case.

[120] Because we will reverse, we do not reach the issue of whether the District Court abused its discretion in denying Plaintiffs leave to amend their pleadings.