

FOR PUBLICATION

In the  
United States Court of Appeals  
For the Eleventh Circuit

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No. 25-13631

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CITADEL SECURITIES LLC,

*Petitioner,*

*versus*

U.S. SECURITIES AND EXCHANGE COMMISSION,

*Respondent,*

INVESTORS EXCHANGE, LLC,

*Intervenor.*

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Petition for Review of a Decision of the  
Securities and Exchange Commission  
Agency No. SR-IEX-2025-02

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Before ROSENBAUM, LAGOA, and MARCUS, Circuit Judges.

ROSENBAUM, Circuit Judge:

High-frequency trading in securities markets is technologically sophisticated and almost incomprehensibly fast.

The dispute in this case centers on 350 microseconds, about one-third of one-thousandth of a second.<sup>1</sup> That sounds fast—and it is—but it’s a long time for a high-frequency trader.

Today, securities trading operates based on electronic orders that travel between data centers extremely quickly, but not instantly. When a security’s price starts to shift on Exchange A, it takes a fraction of a second for traders to update their price for that security on Exchange B. During that time, traders with the fastest technical systems can race ahead to grab those securities at the outdated, “stale” price. They already know where the price is headed.

It’s a bit like making a sports wager using Biff Tannen’s (or Marty McFly’s) almanac in *Back to the Future Part II*.

Certain high-frequency traders make big money from this timing mismatch, called “latency arbitrage.” But investors lose more than \$5 billion each year to latency arbitrageurs.

Intervenor Investors Exchange LLC (“IEX”) created a model to combat latency arbitrage. IEX adds 350 microseconds for incoming orders to reach its securities exchange, using a “speed-bump” coil of fiber-optic cable. IEX software also detects when

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<sup>1</sup> A microsecond is one millionth of a second. Each *millisecond* consists of 1,000 microseconds.

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prices are out of sync across exchanges (when latency arbitrage otherwise occurs). During those moments, IEX speeds up the process of updating traders' prices. Often, that means prices on IEX can sync to the market price before latency-arbitrage orders finish racing through IEX's speedbump.

IEX launched its technology in the equities market. And the District of Columbia Circuit upheld a Securities and Exchange Commission ("SEC" or "Commission") decision approving that technology. Last year, though, IEX proposed to expand into options trading with a new platform, IEX Options. Again, the Commission approved IEX's proposal. 90 Fed. Reg. 45861 (Sept. 23, 2025).

Citadel Securities LLC ("Citadel"), a leading high-frequency trader and market maker, petitioned for review of the Commission's approval order.

Citadel's petition poses five issues for our review. First and second, Citadel challenges the Commission's findings that latency arbitrage exists in options markets and that IEX's model would target latency arbitrage accurately. Third, Citadel asserts that quotations on IEX Options don't meet the criteria to qualify as "protected" quotations. Fourth and fifth, Citadel argues that it was arbitrary and capricious for the Commission to determine that IEX Options will not unfairly discriminate and that IEX Options will not impose an undue burden on competition.

After careful review and with the benefit of oral argument, we conclude that Citadel's positions lack merit. So we deny Citadel's petition.

## I. BACKGROUND

IEX seeks to launch its new exchange, IEX Options, to limit latency arbitrage in the options market. Of course, securities trading can involve a lot of technical and regulatory complexity. But we don't need to get into much of that. Instead, we focus on only the details necessary to understand IEX's approach to the options market and the parties' dispute.

We discuss the background to this case in six parts. First, we review some basic features of modern securities markets. Second, we briefly explain latency arbitrage. Third, we identify unique aspects of options trading that amplify the problems latency arbitrage causes. Fourth, we introduce the parties. Fifth, we describe IEX's model for reducing latency arbitrage. Sixth, we recount the proceedings that brought us here.

### A. *Securities Markets*

We start with the building blocks of securities markets. Among the many types of securities, equity stocks are perhaps the most familiar.<sup>2</sup> Equities include, for example, the shares in public

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<sup>2</sup> A wide range of financial instruments can qualify as "securities." See 15 U.S.C. § 78c(a)(10). Which financial instruments fall within that definition presents a nuanced issue that we need not examine here.

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companies that retail investors might hold in their 401(k) or investment accounts. This case doesn't directly involve equity stocks. But to understand this case, we must first understand the difference and relationship between equity stocks and options—the type of security this case involves.

In contrast to equity stocks, an option is a contract that gives “the purchaser of the option the right, but not the obligation, to buy or sell a security at a specified price (the ‘strike price’), on or before a specified date.” *Dow Jones & Co. v. Int’l Sec. Exch., Inc.*, 451 F.3d 295, 298 (2d Cir. 2006). In this way, options are derivatives of other securities, like the equities we’ve been discussing.

A securities exchange plays the role of the marketplace where buyers and sellers trade stocks or options (or other securities). When a buyer and seller agree to transact at a certain price, the exchange can execute a trade. Once, this trading process relied on “stock traders who yelled out orders from crowded trading floors as they stared at a scrolling tickertape.” *Citadel Sec., LLC v. SEC*, 45 F.4th 27, 29 (D.C. Cir. 2022). No longer. Technology has taken over. So now, as we’ve mentioned, traders send electronic orders to exchanges. Those orders represent that trader’s willingness to buy or sell a certain amount of a particular security at a certain price.

When two orders show a corresponding intention to buy and sell at the same price, the exchange will “match” those orders and execute a trade. *Cboe Glob. Mkts., Inc. v. SEC*, 155 F.4th 704, 711

(D.C. Cir. 2025). That process occurs within the exchange’s “matching engine.” 90 Fed. Reg. at 45870 col.1.

Now we turn to liquidity. Liquidity is essentially the ability to convert an asset into cash quickly and easily without affecting its market price. See Adam Hayes, *Understanding Liquidity and How to Measure It*, Investopedia (Jan. 23, 2026), <https://www.investopedia.com/terms/l/liquidity.asp> [<https://perma.cc/6RCB-MMNN>]. Liquidity on securities markets is important because, among other reasons, it can be slower and involve higher transaction costs to buy or sell a security that is less liquid. See Karl Montevirgen, *Liquidity*, Britannica Money, <https://www.britannica.com/money/liquidity> [<https://perma.cc/ZCR8-DXYV>] (last visited May 20, 2026).

For any specific order, a securities trader functions as either a “liquidity provider” or a “liquidity taker.” *Citadel Sec.*, 45 F.4th at 30. A liquidity provider posts its bid to buy (or offer to sell) a security on an exchange. See *Choe Glob.*, 155 F.4th at 711. A liquidity provider’s order is often called a quotation or quote. A quote will “rest” at the exchange until it executes against another trader’s incoming order or the liquidity provider cancels the quote. See 90 Fed. Reg. at 45864 col.1, 45866 col.2. For their part, a liquidity taker places an order that seeks to “accept a provider’s ‘bid’ to buy or ‘offer’ to sell.” *Citadel Sec.*, 45 F.4th at 30.

Securities markets operate differently than many retail markets (say, the market for a product like frozen dinners). In securities markets, a single trader might play the role of buyer or seller in any

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given transaction. Similarly, a “single trader can don and doff a [liquidity] provider or taker hat at any time.” *Id.*

Still, certain firms called “market makers” specialize as liquidity providers. Market makers add liquidity “by being continuously willing to buy and sell the security in which they are making a market.” *Chi. Bd. Options Exch., Inc. v. SEC*, 889 F.3d 837, 838 n.2 (7th Cir. 2018) (quoting *Newton v. Merrill, Lynch, Pierce, Fenner & Smith, Inc.*, 135 F.3d 266, 268 (3d Cir. 1998) (en banc)). These firms accept regulatory mandates such as “continuous quoting requirements” to consistently have quotes on both the buy and sell side of a particular security. 90 Fed. Reg. at 45878 col.1. Market makers earn their profit based on the “bid-ask spread”—the difference between the prices at which they’ve bid to buy and offered to sell a particular security. *See Newton*, 135 F.3d at 268.

Here’s an example of how these concepts work together. A market maker sends an order to an exchange, offering to sell 20 shares of Flux Capacitors R Us stock at \$50.00 per share. That order then rests on the exchange’s books. A liquidity taker sees the market maker’s quote and sends in an order to buy 20 shares of Flux Capacitors R Us stock at \$50.00 per share. When the liquidity taker’s order hits the exchange’s matching engine, the exchange matches the two orders and executes a trade.

Meanwhile, the market maker will have an order bidding to buy Flux Capacitors R Us stock at the same time. We can suppose that the market maker also had a resting order bidding to buy Flux Capacitors R Us stock at \$49.95 per share. The five-cent difference

between the quoted price to buy and to sell Flux Capacitors R Us shares is the bid-ask spread.

The bid-ask spread and the amount of liquidity are significant to other investors. A tighter bid-ask spread means a better price for liquidity takers. See *Timpinaro v. SEC*, 2 F.3d 453, 458 (D.C. Cir. 1993). For instance, suppose the market maker tightened the bid-ask spread by bidding to buy Flux Capacitors R Us stock at \$49.97 per share and offering to sell at \$49.98 per share (instead of \$49.95 and \$50.00, respectively). Now, a liquidity taker trading against the market maker's bid would earn an extra two cents per share it sold to the market maker. And a liquidity taker buying from the market maker would pay two cents less per share. More liquidity at the best bid price and best offer price is also beneficial to investors. It means investors will have an easier time getting their entire order filled at that best price. See 90 Fed. Reg. at 45872 col.2, 45878 col.2.

### ***B. Latency Arbitrage***

Securities markets aren't static, though. Far from it. Prices of securities change frequently throughout the day.

When a security's quoted prices or other trading activity shifts on one exchange, market makers must update their orders on other exchanges accordingly. See *Citadel Sec.*, 45 F.4th at 30. So market makers update their quoted prices throughout the day, as a

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matter of course. That's because, as we explain later in this opinion, keeping outdated quotes up after the market price has shifted is a recipe for losing money.

That brings us to the issue of latency. Even though orders are zipping around at the speed of light,<sup>3</sup> nothing occurs instantaneously. *Id.* at 29–30. It takes a moment (even if it's one so brief that we measure it in millionths of a second) for information from Exchange A to reach a market maker, for that market maker's algorithm to decide to update its prices, and for its electronic message updating its quotes to reach Exchange B. For example, it takes between 185 and 341 microseconds for information to travel between securities exchanges' data centers in New Jersey. 90 Fed. Reg. at 45880 col.3. We call the tiny amount of time it takes for information to travel between computer systems—and for a firm's computers to react to it—latency.

And technology allows some traders to take advantage of this split-second delay to make money at a significantly lower-than-usual risk. In essence, latency arbitrage permits whoever has the fastest technical systems to exploit their speed advantage to the detriment of other traders in the market. The latency arbitrageur can

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<sup>3</sup> Light travels more slowly through the glass in a fiber-optic cable than it does in a vacuum, so we're not talking about the theoretically maximum speed a reader might remember from the  $E = mc^2$  equation. See Jim Shelton, *Internet at the Speed of Light*, Yale News (May 3, 2022), <https://news.yale.edu/2022/05/03/internet-speed-light> [<https://perma.cc/ACX8-VB7K>].

effectively buy (or sell) a security at a price that their counterparty would no longer willingly sell (or buy) at.

Securities exchanges have proliferated in recent years, creating more sources of latency because of the time to travel between different exchanges. The SEC reports that 29 registered national securities exchanges now exist. Respondent’s Br. 9, Doc. 39. Each registered exchange must publicly disclose information about its orders to satisfy regulatory requirements. For example, exchanges must share the best-bid and best-offer prices for securities available on their exchange. 90 Fed. Reg. at 45867 col.1; *see* 17 C.F.R. § 242.602(a). Exchanges also provide other, proprietary market data for a price. 90 Fed. Reg. at 45871 col.1.

Latency arbitrageurs use that data to target stale quotes in the fraction of a second before a market maker can update them. Those traders can then “turn around and trade those securities at the newly updated national best bid or offer.” *Citadel Sec.*, 45 F.4th at 30–31. So when signals from another exchange show an imminent price change, that creates “a race condition” between “liquidity providers who want to reprice their on-exchange displayed liquidity to reflect the changing market prices and the liquidity takers who want to take before those updates can occur.” 85 Fed. Reg. 54438, 54442 col.3 (Sept. 1, 2020) (“D-Limit Decision”). Latency arbitrageurs combine expensive “low-latency systems, connectivity, and data sources” to win the race. 90 Fed. Reg. at 45871 col.1.

The outcome is terrific for the latency arbitrageur: substantial profits with little risk. One prominent firm’s application of

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high-frequency trading strategies created a “near flawless winning streak over four years of operation, losing money on just a single day.” Yesha Yadav, *Insider Information and the Limits of Insider Trading*, 56 Wash. U. J.L. & Pol’y 135, 146 (2018). The topline numbers are huge. The United Kingdom’s Financial Conduct Authority estimated that investors lose around \$5 billion each year to latency arbitrage in just one subset of the global securities market. See J.W. Verret, *Efforts to Sue the SEC over Broker-Inducement Regulation Unlikely to Succeed*, 17 Ohio St. Bus. L.J. 180, 202 (2023).

But latency arbitrage has negative consequences for many market makers. And that harms the market as a whole. The D.C. Circuit affirmed the SEC’s view that “latency arbitrage tactics” “actually harm the market” and function “less like an actual trade than a surcharge imposed on market participants” by high-frequency traders. *Citadel Sec.*, 45 F.4th at 37. To minimize the risk that latency arbitrageurs will pick off stale prices, market makers who don’t have the fastest systems quote with a bigger bid-ask spread or at a smaller size—meaning worse prices and less liquidity. 90 Fed. Reg. at 45875 col.1. IEX notes the real-world impact of those defensive actions on the options market: The number of options market makers has declined over time, with less displayed liquidity for each security and market makers’ spreads almost doubling over the past decade. *Id.* at 45875 col.1.

These effects make it harder for a retail investor (like an individual) or institutional investor (like a pension plan) to buy or sell

a security at a favorable price. In a sense, everyone else in the market must pay a latency arbitrage “tax.” *See id.* at 45876 col.3 n.246.

### *C. Unique Challenges in Options Markets*

This case centers on options. And as we’ve mentioned, the price of an option depends in significant part on the price of the underlying security. 90 Fed. Reg. at 45870 col.3 (noting that the “quoted price [of an option] is derived in substantial part from the price of the underlying security . . . upon which they are based”).

Consider again the Flux Capacitors R Us stock that a market maker offers for sale at \$50.00 per share. Perhaps a trader thinks it likely that Flux Capacitors R Us will increase in price to more than \$60 within the next three months. So that trader purchases an option that gives her the right to buy 100 shares of Flux Capacitors R Us stock at \$60.00 any time before a specific date three months in the future. If the price of the stock increases to, say, \$70.00 per share in that period, the trader who bought the option can buy the \$70 share for \$60.

In the Commission’s view, two key differences between the options market and the equities market exacerbate the risk of latency arbitrage in the options market.

First, a dizzying number of options is available. Each equity can correspond to many options combining different strike prices (e.g., \$55.00 and \$65.00 per share) and dates (e.g., July 31 and September 30, 2026). So although U.S. exchanges list around 11,000 equity securities, they list around 1.5 million options. *See id.* at

45870 col.3 n.176.<sup>4</sup> That is, U.S. exchanges list about 135 times more options than equities. Because of the number of options, options markets are less able to rely on “natural liquidity” from another trader who coincidentally wants to trade the same security. Rather, market makers play a critical role in providing liquidity, accounting for more than 99 percent of open orders and quotes in options markets. *See* 90 Fed. Reg. at 26888 col.2.

Because of the large number of options, the Commission has opined that latency arbitrage is “especially acute” in options markets. 90 Fed. Reg. at 45875 col.1. Each time the price of a single underlying equity stock changes, market makers may need to update prices for hundreds or even thousands of options. *Id.* at 45874 col.3.

The second difference between equity stocks and options is that options-market participants trade on exchanges only. *Id.* at 45875 col.2. In contrast, equities traders need not necessarily go to an exchange (where latency arbitrage proliferates). Unlike options traders, equity traders can alternatively trade equities in an “over-the-counter market.” *Id.* So equities investors can seek to trade in environments that are less affected by latency arbitrage. Options investors cannot. The Commission reasoned that this difference, too, justified taking action against latency arbitrage in options markets. *Id.*

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<sup>4</sup> Each combination of attributes such as price and expiration date is technically called an “options series.” For simplicity, we refer simply to “options.”

#### *D. The Parties*

Petitioner Citadel is a prominent market maker and high-frequency trader in equities and options markets. In fact, by itself, Citadel makes up almost a third—30 percent to be precise—of U.S. consolidated equity options trading volume. See *Options Trading at Scale*, Citadel Securities, <https://www.citadelsecurities.com/what-we-do/options/> [<https://perma.cc/HEG8-MLCU>] (last visited May 15, 2026).

Respondent SEC is the nation’s leading regulator of securities markets. It oversees the “national market system” of securities markets. 15 U.S.C. § 78k-1(a)(2). Under the Securities Exchange Act of 1934 (“Exchange Act”), securities exchanges are self-regulatory organizations that must file their proposed rules for the Commission’s review. 15 U.S.C. §§ 78c(a)(26), 78s(a)(1), (b)(1). The Commission approves an exchange’s proposed rule if it finds the proposal is consistent with the Exchange Act and related regulations. *Id.* § 78s(b)(2)(C)(i)–(ii).

Intervenor-Respondent IEX is a securities exchange that describes its approach to securities trading as “combat[ing] the predatory trading practice called ‘latency arbitrage.’” IEX gained SEC approval to enter the equities market in 2016. 81 Fed. Reg. 41142, 41142 col.3 (June 23, 2016). IEX’s exchange initially handled only orders that aren’t publicly displayed. But in 2020, the Commission approved IEX to use the same technology for publicly displayed equity orders. 85 Fed. Reg. at 54438 col.2. In 2022, the D.C. Circuit

upheld the D-Limit Decision against a challenge from Citadel. *Citadel Sec.*, 45 F.4th at 31.

### *E. IEX's Model*

Since 2016, IEX has sought to address latency arbitrage in the equities market. Now, IEX proposes to bring its approach to options trading. In both contexts, IEX's model has two parts.

The first is hardware—an “access delay” created by a 38-mile coil of fiber-optic cable that IEX calls its “speedbump.” All incoming orders on IEX's exchange, including liquidity providers' quotes, must traverse that speedbump before hitting IEX's system for order matching and trade execution. 90 Fed. Reg. at 45866 col.1. The speedbump adds 350 microseconds to the time it takes incoming orders to reach IEX's system. *Id.*

The second part of IEX's model is software that allows IEX to sense imminent unfavorable price changes and to accordingly cancel or reprice stale quotes. On IEX's options exchange, IEX's proposal involves the Options Quote Indicator (“Indicator”) and Options Risk Parameter (“ORP”). The Indicator applies a “quote instability” calculation to real-time information about quotes on eleven other exchanges. *Id.* at 45866 col.2. This process identifies impending changes to the price of an option listed on IEX's exchange. Market makers on IEX Options may opt into having their quotes protected by the ORP. If they do, and the Indicator detects an imminent adverse price change, IEX Options will either cancel

the quote or reprice it to the amount IEX predicts will be the new prevailing price. *Id.* at 45869 col.2.

The model's effectiveness comes from combining these two features. The data traveling from other exchanges to IEX doesn't go through the speedbump. So IEX can often update a stale quote before a latency arbitrageur's order finishes traversing the 350-microsecond speedbump and reaches IEX's computers. If so, the latency arbitrageur's order will arrive to find no stale quote to pick off.

IEX's model has allowed it to carve out a modest market share of the national equities market, about three percent. *See id.* at 45879 col.2.

#### ***F. Procedural History***

IEX submitted its proposal for IEX Options ("IEX Proposal") to the SEC in January 2025. 90 Fed. Reg. at 45861 col.3. After that, IEX amended its proposal three times, with the final amendment in June 2025. *See id.* at 45861 col.3–45862 col.1. The only material differences between the IEX Proposal and rules the Commission has approved for other options exchanges are the access delay that the speedbump creates and the ORP. *See id.* at 45862 col.2.

Upon receipt of the IEX Proposal, the Commission solicited public comment on it. *Id.* Commenters included competing options exchanges, market makers, institutional investors, elected officials, retail investors, advocacy and trade groups, and IEX itself.

On September 18, 2025, the Commission issued an order approving the IEX Proposal (“Approval Order”). *See id.* at 45862 col.1. The Commission found that the IEX Proposal is consistent with the Exchange Act and related regulations. *See id.* at 45867 col.2. And it concluded that the IEX Proposal’s rules were not “designed to permit unfair discrimination between customers, issuers, brokers, or dealers,” 15 U.S.C. § 78f(b)(5); *see* 90 Fed. Reg. at 45867 cols.2–3, and did “not impose any burden on competition not necessary or appropriate in furtherance of the purposes of [the Exchange Act],” 15 U.S.C. § 78f(b)(8); *see* 90 Fed. Reg. at 45867 cols.2–3. The Commission also determined that quotes subject to the ORP are “protected quotations” as defined by the Options Order Protection and Locked/Crossed Market Plan (“Options Plan”). *See* 90 Fed. Reg. at 45874 col.2.

A month after the Commission approved the IEX Proposal, on October 17, 2025, Citadel timely filed a petition in this Court for review of the Commission’s Approval Order. We granted IEX’s motion to intervene and set the case for expedited briefing<sup>5</sup> and oral argument.

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<sup>5</sup> In addition to the parties’ submissions, the Court received five amicus briefs. One, supporting Citadel, came from three options exchanges that state they will be “direct competitors of IEX Options.” The other four amici supported the Commission. They include Professor J.W. Verret, an Associate Professor of Law at George Mason University’s Antonin Scalia Law School; CTC, LLC, which operates as a market maker in the options market; and two nonprofit organizations: Better Markets, Inc. and Healthy Markets Association.

## II. STANDARD OF REVIEW

We review the Commission’s final orders under the Administrative Procedure Act’s (“APA’s”) arbitrary-and-capricious standard. *Am. Sec. Ass’n v. SEC*, 147 F.4th 1264, 1273 (11th Cir. 2025).

Under that standard, we will “hold unlawful and set aside agency action, findings, and conclusions” that we conclude are “arbitrary, capricious, an abuse of discretion, or otherwise not in accordance with law.” 5 U.S.C. § 706(2)(A). But this standard is “exceedingly deferential.” *City of North Miami v. Fed. Aviation Admin.*, 47 F.4th 1257, 1266 (11th Cir. 2022) (quoting *Miccosukee Tribe of Indians of Fla. v. United States*, 566 F.3d 1257, 1264 (11th Cir. 2009)). A “court may not substitute its own policy judgment for that of the agency.” *FCC v. Prometheus Radio Project*, 592 U.S. 414, 423 (2021). Rather, we must “simply ensure[] that the agency has acted within a zone of reasonableness and, in particular, has reasonably considered the relevant issues and reasonably explained the decision.” *Id.*

We review the Commission’s legal conclusion de novo. *Orkin v. SEC*, 31 F.3d 1056, 1063 (11th Cir. 1994). But we treat its factual findings as conclusive if substantial evidence supports them. *Id.*; see 15 U.S.C. § 78y(a)(4). Substantial evidence is such “relevant evidence that a reasonable mind might accept as adequate to support a conclusion,” even if a reasonable person could also reach a different conclusion on the same record. *Nat’l Parks Conservation Ass’n v. U.S. Dep’t of the Interior*, 835 F.3d 1377, 1384 (11th Cir. 2016) (brackets omitted) (quoting *Stone & Webster Constr., Inc. v. U.S. Dep’t of Lab.*, 684 F.3d 1127, 1133 (11th Cir. 2012)).

### III. DISCUSSION

Citadel invokes the APA and the Exchange Act to challenge five of the Commission's determinations. We take them in turn.

#### *A. Substantial evidence supports the Commission's factual findings.*

We begin by determining that substantial evidence supports two of the Commission's factual findings: that latency arbitrage exists in and detrimentally affects the options market, and that the ORP activates during moments of high risk of latency arbitrage without substantially impeding ordinary trading. Because substantial evidence supports both of these findings, we must treat them as conclusive. *See* 15 U.S.C. § 78y(a)(4).

##### *1. Substantial evidence supports the Commission's finding that latency arbitrage exists in the options market.*

We first address Citadel's contention that the Commission had no evidence that latency arbitrage exists in the options market. Citadel asserts that the Commission simply assumed that latency arbitrage is a problem in options trading. Citadel also argues that this finding cannot stand because the Commission lacks the type of quantitative data that supported its D-Limit Decision approving IEX's model in the equities market.

We disagree. Substantial evidence supports the Commission's finding that latency arbitrage poses a problem in options trading and disincentivizes many market makers from providing

liquidity. The finding enjoys sufficient support from two principal sources: market participants' comment letters and the SEC's synthesis of its past experience addressing latency arbitrage in analogous markets with its expert understanding of market structure. Plus, Citadel's demand for more quantitative data lacks a legal basis.

We discuss the two categories of substantial evidence supporting the Commission's decision, then turn to Citadel's effort to require a third.

a. Comments from Market Participants

Five options market makers said in public comments that latency arbitrage is a common and costly problem in options trading. *See* App'x at A71 (All Options USA LLC), A76 (HAP Trading LLC), A139–40 (Maven Securities); Suppl. App'x at SA52 (CTC, LLC), SA68 (Volant Trading). These comments explained how latency arbitrage forces market makers to widen their bid-ask spread—that is, offer worse prices—or reduce the liquidity they provide. *See* App'x at A139–40 (Maven Securities); Suppl. App'x at SA52 (CTC, LLC); App'x at A76 (HAP Trading LLC).

And these firms put money behind their views. For instance, one options market maker reported needing to spend at least \$10 million each year “to merely reduce, but not eliminate,” pickoff trades from latency arbitrageurs. 90 Fed. Reg. at 45877 cols.2–3. Another, Volant Trading, said that “the escalating costs and arms

race associated with maintaining latency competitiveness” ultimately forced it to exit the business altogether. Suppl. App’x at SA68 (Volant Trading).

These comments supported the Commission’s conclusion that latency arbitrage negatively affects the options market. 90 Fed. Reg. at 45872 col.3. Indeed, the Approval Order found that the IEX Proposal addresses “a legitimate disadvantage in latency arbitrage faced by market makers that may lack the expensive low-latency systems, connectivity, and data sources used by those engaged in such strategies.” *Id.*

And the Approval Order buttressed this conclusion by looking to comments from IEX and from institutional investors. IEX compiled sources showing a sharp drop in the number of active options market makers and a near-doubling of their bid-ask spreads over the past ten years. *See id.* at 45875 col.1 (citing Letter from John Ramsay, IEX, at 5–6 (June 19, 2025), <https://www.sec.gov/comments/sr-iex-2025-02/sriex202502-615827-1806874.pdf> [<https://perma.cc/X2X6-JDRY>]). Meanwhile, a group of eight public pension funds, institutional investors, and fiduciaries emphasized their view that latency arbitrageurs impose a “tax on liquidity” that increases costs for ordinary investors. Suppl. App’x at SA83.

The comments we’ve canvassed provide substantial evidence that latency arbitrage is a problem in options trading. Input gathered during a comment period can often provide sufficient sup-

port for an agency’s factual finding. See *Stilwell v. Off. of Thrift Supervision*, 569 F.3d 514, 519 (D.C. Cir. 2009) (Kavanaugh, J.); accord *Am. Iron & Steel Inst. v. Occupational Safety & Health Admin.*, 182 F.3d 1261, 1273 (11th Cir. 1999). In fact, an important purpose of soliciting public comment is to gather information so that the agency can “avoid errors and make a more informed decision.” *Azar v. Allina Health Servs.*, 587 U.S. 566, 582 (2019).

It’s notable, too, that the record contains no evidence that latency arbitrage is absent from the options market. And Citadel points to none. To be sure, the substantial-evidence standard does not require us to resolve conflicts in the evidence before the Commission. See *Domestic Sec., Inc. v. SEC*, 333 F.3d 239, 249 (D.C. Cir. 2003). But given that the agency doesn’t even need to show a preponderance of the evidence, *Ga. Dep’t of Educ. v. U.S. Dep’t of Educ.*, 883 F.3d 1311, 1314 (11th Cir. 2018), the fact that the evidence before the Commission was “uncontroverted” only bolsters the Commission’s conclusion, 90 Fed. Reg. at 45872 col.3; cf. *Prometheus Radio*, 592 U.S. at 425 (endorsing an agency’s reliance, in part, on the “the absence of any countervailing evidence”).

b. Expertise and Market Structure

In addition to information from the public, the Commission relied on its experience and understanding of market structure. Those bases led the Commission to conclude that latency arbitrage is “especially acute” in options markets. 90 Fed. Reg. at 45875 cols.1–2.

The SEC has robust experience with latency arbitrage in electronic securities markets. As we've mentioned, the Commission has twice approved IEX proposals to apply a 350-microsecond access delay and repricing-or-cancellation tool to limit latency arbitrage in the equities market. *See* 81 Fed. Reg. at 41142 col.3; 85 Fed. Reg. at 54438 col.3.

And the Approval Order identifies structural factors that make options trading more vulnerable to latency arbitrage than the equities market. As we discussed earlier, those factors include the huge number of tradeable options compared to the number of underlying securities—causing market makers to play a central role in providing liquidity and requiring them to rapidly reprice numerous options after a single underlying security's price changes—and the lack of off-exchange trading. 90 Fed. Reg. at 45875 cols.1–2. The Commission may reasonably pair its experience in analogous securities markets with its understanding of unique aspects of options trading that make latency arbitrage particularly concerning.

Citadel argues that the Commission's past experience is irrelevant. In support of its position, Citadel highlights the different genesis of latency arbitrage in options and equities markets. In equities markets, latency arbitrage exploits fleeting discrepancies between the same security's price on different exchanges. With options, latency arbitrage targets moments when the price of an option, a derivative security, does not yet reflect a change to the underlying security's price on another exchange.

We don't see how the difference matters. In both scenarios, a price change on one exchange creates a "race condition" between the market maker seeking to update its price on another exchange and a latency arbitrageur trying to grab the "stale" quote. *See id.* at 45870 col.3–45871 col.1 (options market); 85 Fed. Reg. at 54442 col.3 (equities market).

But in any event, we apply a particularly deferential review to matters, like this one, that implicate an agency's technical expertise. *See Choe Glob.*, 155 F.4th at 716; *cf. Nat'l Min. Ass'n v. Sec'y, U.S. Dep't of Lab.*, 812 F.3d 843, 866 (11th Cir. 2016) ("[L]ike our colleagues on the District of Columbia Circuit, we believe it appropriate to 'give an extreme degree of deference to the agency when it is evaluating scientific data within its technical expertise.'" (quoting *Kennecott Greens Creek Min. Co. v. Mine Safety & Health Admin.*, 476 F.3d 946, 954 (D.C. Cir. 2007))). We find no fault with the agency synthesizing its understanding of options market structure with its past experience in analogous markets.

c. Citadel's Demand for Quantitative Data

Last, Citadel complains that IEX did not provide the same type of quantitative data that the D.C. Circuit considered persuasive in *Citadel Securities*. In that case, IEX showed that 24 percent of trading on IEX occurs during the 0.007 percent of the day that the equities version of the Indicator detects a pricing anomaly. *Citadel Sec.*, 45 F.4th at 33. The D.C. Circuit considered the disparity to be substantial evidence that high-frequency traders engage in latency arbitrage during that time. *Id.*

But it's no surprise that IEX didn't provide the same type of data here. IEX had an operational equities exchange before the Commission approved IEX's model in the D-Limit Decision, an order the D.C. Circuit upheld in its *Citadel Securities* decision in 2022. But IEX Options is not yet operational. So IEX could not use data from its exchange to show the share of options trading that occurs while prices are stale.

More importantly, though, Citadel's argument is unsound. Administrative law doesn't constrain agencies to act only when they have gold-standard quantitative data. The "APA imposes no general obligation on agencies to produce empirical evidence." *Stilwell*, 569 F.3d at 519. Nor does the Exchange Act. Courts regularly note that the Commission "need not—indeed cannot—base its every action upon empirical data." *Nasdaq Stock Mkt. LLC v. SEC*, 38 F.4th 1126, 1142 (D.C. Cir. 2022) (quoting *Chamber of Com. of U.S. v. SEC*, 412 F.3d 133, 142 (D.C. Cir. 2005)). And having a particularly robust record in one proceeding doesn't somehow heighten the evidentiary bar for all future actions.

2. *Substantial evidence supports the Commission's finding that the ORP targets latency arbitrage.*

Next, we address the Commission's finding about how accurately the ORP targets latency arbitrage.

As the Approval Order notes, the ORP applies only when an option's price is dislocated enough from the underlying stock's price to create a "high potential for latency arbitrage." 90 Fed. Reg.

at 45871 col.2. The Commission found that the Indicator’s price-dislocation signal will effectively “target firms engaged in latency arbitrage” because few firms have the capacity to target their trading to the microsecond-scale moments of price dislocation. *Id.* at 45871 col.2, 45882 col.1. For this same reason, the Commission determined that the ORP generally will not affect market participants that aren’t engaged in latency arbitrage. Those “investors do not typically trade in microseconds.” *Id.* at 45871 col.2. We refer to these conclusions as the Commission’s “targeting” finding.

Citadel attacks the targeting finding in two ways. First, Citadel argues that the finding rests entirely on a “meaningless” statistic about the percentage of the day that the ORP could affect quotes. And second, Citadel insists, the Commission also acted arbitrarily because it didn’t analyze trading data from the SEC’s Consolidated Audit Trail when it made its targeting finding. Neither argument has merit.

a. Supporting Evidence

Substantial evidence supports the Commission’s targeting finding. IEX produced data showing that, even under aggressive assumptions, the ORP would affect quotes on IEX Options “significantly less than 0.001% of the trading day” on average. *Id.* at 45881 col.3 (quoting 90 Fed. Reg. 26865, 26889 col.2 (June 24, 2025)). That’s so because prices are dislocated between exchanges for only that small fraction of the day.

And as the public comments explained, only a small number of firms direct their orders to the millionths of a second when prices are dislocated between exchanges. *See id.* at 45871 col.2 & n.181. Ordinary investors typically do not. *See id.* Indeed, only a small number of firms even have the technology to do that. So the Commission was well-justified in treating IEX’s time-based data as “relevant and persuasive.” *Id.* at 45882 col.1. IEX’s percent-of-day data gave the Commission a sound basis to conclude that the ORP would have a minimal impact on ordinary trading.

Citadel’s efforts to persuade us to the contrary fail. Citadel emphasizes that the ORP would affect quotations for certain options up to 0.2 percent of the trading day. But the Commission expressly considered this higher number. *Id.* at 45881 col.3. Still, it determined that the ORP would apply only in “infrequent” conditions. *Id.* at 45882 col.1. Citadel may believe that 0.2 percent of the trading day is frequent. But we will not second-guess reasonable determinations that, like this one, implicate an agency’s technical expertise and policy-making discretion. *See City of North Miami*, 47 F.4th at 1266, 1268.

Citadel also contends that the Commission should have focused on the proportion of orders the ORP affects, not the percentage of time. But the ORP targets latency arbitrage. And by their very nature, latency-arbitrage orders cluster during moments when quotes become stale. So it makes sense for the ORP to focus on time periods. Indeed, the Commission’s Approval Order explains well why the Commission viewed volume-based statistics as

misleading. The more effective a tool is in heading off would-be latency-arbitrage orders, the greater the volume of (latency-arbitrage) orders it affects and the more it lowers the exchange's fill rate.<sup>6</sup> *See* 90 Fed. Reg. at 45882 col.1. Yet evidence in the record shows that retail investors do not and generally cannot target their orders to the millionths of a second when prices are dislocated. *See id.* at 45871 col.2 & n.181. So a reasonable mind could accept IEX's time-based data as a proxy for the share of retail orders that would reach IEX Options while the ORP affects stale quotes that latency arbitrageurs try to pick off.

Citadel contends that time is a poor proxy because, it suggests, non-latency-arbitrage orders will cluster during the microseconds that the ORP affects quotes. In Citadel's view, investors that aren't involved in latency arbitrage trade for options most actively during the same millionths of a second that intense trading of the underlying security dislocates equity and options prices. It's not inconceivable that this is true. But Citadel provides no evidence for this proposition.<sup>7</sup> And substantial evidence in the record

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<sup>6</sup> The "fill rate" is the proportion of incoming orders that execute a trade. *See* 90 Fed. Reg. at 45876 cols.1–2 n.237.

<sup>7</sup> In fact, this argument highlights another shortcoming in Citadel's demand for the type of quantitative data IEX shared in the D-Limit Decision proceeding. Without separating out latency-arbitrage trades from other trading activity, evidence of a high volume of trading "during the 'small increments of time'" that the ORP affects quotes would support the Commission's determination that "short-term investors engage in latency arbitrage" during the fleeting moments of price dislocation and that the ORP targets latency arbitrage. *Citadel Sec.*, 45 F.4th at 33 (quoting 85 Fed. Reg. at 54442 col.3). As the D.C.

supports the Commission’s targeting finding. Mere speculation is not enough for us to disregard that evidence.

b. Consolidated Audit Trail Data

Citadel also faults the Commission for not considering data from the Consolidated Audit Trail (“CAT”).<sup>8</sup> This data, Citadel says, would definitively answer how often the ORP would affect retail investors’ orders. Fundamentally, this argument goes beyond the substantial-evidence standard to assert that the Commission acted arbitrarily and capriciously. We are not persuaded.<sup>9</sup>

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Circuit observed when reviewing the D-Limit Decision, “trading during the two-millisecond moments that the crumbling quote indicator is on requires either incredible chance or incredible technological advantages that permit timing orders down to the microsecond. The SEC reasonably concluded that the latter explanation is correct[.]” *Id.* We remain unsure how Citadel believes similar data would justify denying the IEX Proposal.

<sup>8</sup> Although it doesn’t factor into our analysis, we are aware that Citadel has twice in the past two years argued to this Court that the CAT is unlawful. In fact, Citadel continues to press this argument in ongoing litigation in a different matter. Pet’rs’ Opposed Mot. for Stay 10–11, *Am. Sec. Ass’n v. SEC*, No. 26-10936 (Apr. 2, 2026); *see also Am. Sec. Ass’n*, 147 F.4th at 1269. So it’s interesting that Citadel here urges that the SEC must review CAT data before acting.

<sup>9</sup> Citadel’s opening brief also asserts that the Commission should have required IEX to produce data about how frequently the ORP will activate and the number of orders it will affect. Citadel abandoned this position by failing to respond to the SEC’s and IEX’s counterarguments. The argument is unconvincing in any event. As we explored above, the Commission competently explained why it views volume-based statistics as misleading. It isn’t unreasonable to proceed without unhelpful data.

The CAT contains a staggering amount of raw data. It processes more than 400 billion records *each day*. See Respondent’s Br. 52, Doc. 39. But the Commission need not build an elaborate, customized statistical model to process trillions of raw records every time it must consider a rule proposal. See *Prometheus Radio*, 592 U.S. at 415 (“The APA imposes no general obligation on agencies to conduct or commission their own empirical or statistical studies.”).

Nor would such an expectation be reasonable here, given the tight time limits the Commission operates under. Generally, the Commission must publish notice of an exchange’s proposed rules “as soon as practicable” and then approve or disapprove them within 45 days. See 15 U.S.C. § 78s(b)(1), (b)(2)(A)(i). The Commission may extend that review for an additional 45 days. See *id.* § 78s(b)(2)(A)(ii).

Congress’s constraints on an agency’s review frame our analysis. “[T]he parameters of the arbitrary and capricious standard of review will vary with the context of the case.” *Dist. Hosp. Partners, L.P. v. Burwell*, 786 F.3d 46, 57 (D.C. Cir. 2015) (quoting *WWHT, Inc. v. FCC*, 656 F.2d 807, 817 (D.C. Cir. 1981)). So “[w]hether an agency has arbitrarily used deficient data depends on the specific facts of a particular case.” *Id.* Citadel doesn’t explain how it would be feasible for the Commission to build a statistical model to timely analyze raw CAT data, publish the resulting analysis for public consideration, gather comments, evaluate that input, and reach a decision—all within the 90-day period. We certainly

cannot say the Commission acted arbitrarily or capriciously in not doing so.

***B. Quotations on IEX Options qualify as “protected.”***

The third issue before us is whether quotes subject to the ORP qualify as “protected” quotations. For quotes with “protected” status, an exchange must route certain options orders to a competing exchange if that competitor has a protected quotation with the best buy or sell price nationally. *See* Options Plan §§ 2(17), (21), 5(a), 74 Fed. Reg. 39362, 39370 col.3–39371 col.2 (Aug. 6, 2009). Citadel urges that it was legal error for the Commission to deem quotes subject to the ORP to be “protected” because they are not truly “firm” quotes. But this position lacks a basis in the relevant legal requirements.

Citadel makes its argument under two legal frameworks: the Options Plan and Regulation NMS.

The Options Plan is the correct legal framework. As a reminder, the Options Plan is the Options Order Protection and Locked/Crossed Market Plan. *See* 90 Fed. Reg. at 45874 col.2. And the parties even agree that the Options Plan governs which quotes are “protected” in the options market. Citadel does not dispute that quotes on IEX Options will meet the definition of “Protected Bid” or “Protected Offer” under the Options Plan.<sup>10</sup> And ordinarily,

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<sup>10</sup> Under the Options Plan, a quotation is a “Protected Bid” or “Protected Offer” if it (1) is publicly displayed on a qualifying securities exchange; (2) is disseminated pursuant to the Options Price Reporting Authority Plan; and (3) is

the Options Plan prohibits exchanges from executing trades at a worse price (for the liquidity taker) than a protected quotation displayed on another exchange. *See* Options Plan §§ 2(21), 5(a)(i), 74 Fed. Reg. at 39370 col.3–39371 col.1. As a result, exchanges must route orders to a competitor with a better quote. *See id.*

Citadel asserts that quotes on IEX Options are “non-firm” quotes that should not enjoy mandatory order routing. *See* Options Plan § 5(b)(vii), 74 Fed. Reg. at 39371 col.2. The Options Plan defines non-firm quotations based on an exchange’s own rules. Citadel contends that market makers with quotes subject to the ORP are “relieved from their obligations under [IEX Options’s] firm quote rule” to follow through on the best price offered, making their quotes non-firm. Options Plan § 2(11), 74 Fed. Reg. at 39370 col.2.

This argument misses the mark. IEX’s rules identify four scenarios under which quotes on its options exchange are not firm.<sup>11</sup> Citadel does not even attempt to show that any of those four criteria apply. Because the definition of non-firm quotations

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the highest-priced bid to buy or the lowest-priced offer to sell that option on the exchange. Citadel does not dispute that the best-priced quotation on IEX Options meets this definition even if it’s subject to the ORP.

<sup>11</sup> Those four scenarios are system malfunctions, unusual market conditions that make the market in an option “fast,” trading rotations, and when a liquidity provider revises the quotation size or price before an order is presented. *See* Exhibit 5 to Notice of Filing of Amendment No. 3, at 554–55, <https://www.sec.gov/files/rules/sro/iex/2025/34-103290-ex5.pdf> [<https://perma.cc/JC4C-CFP8>] (Proposed Rule 23.150(d)(1)).

depends on an exchange's rules, that settles the legal question. Quotes subject to the ORP meet the criteria to be a "protected" quotation and don't fall within the non-firm quotation exception. The Commission didn't err in reaching this conclusion.<sup>12</sup>

Citadel's second legal framework is inapplicable. Regulation NMS governs which quotations are "protected" in the *equities* market. See 17 C.F.R. § 242.600(b)(65), (b)(81)–(82). It doesn't apply to options quotes.

For this reason, Citadel tries to import Regulation NMS's requirements by claiming that the Commission "invoked" Regulation NMS and thus had to satisfy the regulation's standard. Then, Citadel insists that quotes on IEX Options don't "immediately" execute within the meaning of Regulation NMS. But Citadel cannot alter the relevant legal standard in this way.

Indeed, the Approval Order explained clearly that Regulation NMS *doesn't* apply here. 90 Fed. Reg. at 45874 col.1. Specifically, the Commission spelled out that the Options Plan has no requirement similar to the "immediate" execution mandate that Citadel seeks to import. *Id.*

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<sup>12</sup> At bottom, Citadel's arguments focus more on whether quotes on IEX Options will be "firm" in a colloquial, not legal, sense. Whether IEX Options quotes are firm in this looser sense goes to whether mandatory order-routing rules make the IEX Proposal unfairly discriminatory or unduly burdensome on competition. We consider those issues below.

Because neither legal framework can support its argument, we reject Citadel’s assertion that the Commission made a legal error by deeming quotes subject to the ORP to be “protected.”

***C. The Commission reasonably concluded that IEX Options will not unfairly discriminate.***

Now, we turn to the Commission’s decision that the IEX Proposal isn’t “designed to permit unfair discrimination between customers, issuers, brokers, or dealers.” 15 U.S.C. § 78f(b)(5). Citadel contends that this determination was arbitrary and capricious. Under the APA’s deferential standard of review, we disagree.

No one disputes that the ORP treats market makers differently than other market participants. In some sense, then, the ORP “discriminates” between market participants. But the Exchange Act “prohibits ‘*unfair* discrimination,’ not ‘discrimination’ simpliciter.” *Timpinaro*, 2 F.3d at 456 (emphasis added). So we ask whether the Commission reasonably concluded that the ORP will not unfairly discriminate in favor of market makers that register with IEX Options.

According to Citadel, IEX Options gives market makers an exclusive and unfair “one-sided repricing privilege.” Citadel emphasizes that the ORP activates only when an imminent *adverse* price change will make a market maker’s stale quote less profitable. The opposite isn’t true. IEX allows a stale quote to trade if an imminent *favorable* price change means the old price is extra lucrative for a market maker. Based on this difference, Citadel portrays IEX

as helping market makers illicitly “back away” from their quotes after an executable order arrives. And as Citadel repeatedly stresses, SEC rules require brokers to route orders to the exchange that provides the best price for an option. So Citadel claims that the whole market is forced into IEX’s “rigged game.”

The superficial appeal of Citadel’s arguments collapses on inspection. First, Citadel’s concern that IEX Options would facilitate “backing away” from quotes is baseless. Second, the IEX Proposal is an appropriate risk protection that is commensurate with the risk that market makers uniquely bear. That effect redounds to the benefit of the rest of the market. Third, the ORP’s benefit to market makers, specifically, is in line with the benefits market makers receive from other exchanges’ risk protections. We are satisfied that the Commission considered the relevant issues and reasonably explained its conclusion. *Prometheus Radio*, 592 U.S. at 423.

#### 1. Citadel’s “Backing Away” Concern

Citadel contends that the IEX Proposal would unfairly allow market makers to selectively “back away” from quotes at the moment of execution. In Citadel’s view, the IEX Proposal allows market makers to “avoid losing trades” by having IEX pick and choose which of their quotes an incoming order can execute against. Citadel asserts that this “at-execution repricing privilege” “mechanize[s] backing away on a market-wide scale.”

This argument relies on two misunderstandings. To start with, “backing away” refers to the practice of failing to execute orders “*after* they were matched” by the exchange. *In re Credit Suisse Sec. (USA) LLC*, No. 3-17079, Release No. 10014, 2016 WL 683553, at \*6 (SEC Jan. 31, 2016) (emphasis added).

Again, though, that’s not how the ORP functions. An incoming order doesn’t arrive at IEX Options until it finishes traversing the speedbump. *See Citadel Sec.*, 45 F.4th at 33 n.5. And an order can’t match with a quote on IEX Options before exiting the speedbump and reaching IEX’s matching engine. If an order arrives at IEX Options and matches with a quote before the Indicator turns on, the ORP will have no effect on whether the order executes. If an order arrives at IEX Options (or any exchange) after a corresponding quote is canceled—whether by the ORP or by a market maker’s own update—no match ever occurs. And execution happens only after a match. So Citadel is wrong to contend that the ORP is an “at-execution repricing privilege.”

Similarly, as the Commission has explained, the ORP simply speeds up the process of price updates that the market maker would be doing anyways to maintain the derivative pricing relationship between the underlying security and the options quote. *See* 90 Fed. Reg. at 45871 col.3. The ORP’s updates occur according to “predetermined, transparent, and codified rules,” as well. *Id.* For example, the ORP is governed by a formula and methodology described in IEX’s rulebook, which can be modified only through a proposed rule change IEX files with the SEC. *Id.* at 45872 col.1. So

Citadel's repeated suggestion that IEX would exercise discretion to choose which quotes to execute is just inaccurate.

## 2. *Broadly Beneficial Risk Protection*

Citadel's more general arguments that the ORP is unfair don't persuade us, either. The Commission explained that applying the ORP just to market makers is a reasonable risk protection that will benefit the market as a whole. The Approval Order states that the ORP's protection against latency arbitrage is "commensurate with the risk uniquely undertaken by [m]arket [m]akers" because of their continuous quoting obligations across a large number of options. *Id.* at 45878 col.2.

Citadel responds with only one direct counterargument: that the benefit to market makers is excessive because latency arbitrage in options trading is a "speculative problem." That is, Citadel continues to engage in a non-denial denial of latency arbitrage's existence. But as we have explained, substantial evidence supports the Commission's latency-arbitrage finding. So we must treat the Commission's latency-arbitrage finding as conclusive.

Plus, market makers play a linchpin role in the options market. As a result, many market participants will share in the ORP's benefits. The Commission expects that the ORP will create an "increase in displayed liquidity at competitive prices." *Id.* at 45872 col.2. The Commission also recognized the ORP's goal to "incentivize market makers to quote with additional depth at potentially

improved prices, which directly benefits all market participants when that liquidity is available to the market.” *Id.* at 45878 col.2.

In fact, despite Citadel’s contrary arguments, this is the same rationale that the D.C. Circuit gave for upholding the Commission’s D-Limit Decision. The court determined that the D-Limit order type on IEX’s equities exchange did not unfairly discriminate because it “benefits all market participants.” *Citadel Sec.*, 45 F.4th at 35 (quotation marks omitted). The same reasoning applies here.

In other words, IEX Options’s direct benefits to market makers create indirect benefits for the rest of the market. Latency arbitrageurs, of course, are the exception. If all goes as planned, they will lose their ability to take nearly risk-free profits. But we struggle to see the unfairness in making it more difficult for latency arbitrageurs to impose a unilateral “surcharge” or tax on the rest of the market. *Id.* at 37.

Plus, the Commission’s “predictive market judgments” about the ORP’s effects implicate the Commission’s “technical expertise” and policymaking discretion. *Choe Glob.*, 155 F.4th at 716 (quoting *AD HOC Telecomms. Users Comm. v. FCC*, 572 F.3d 903, 908 (D.C. Cir. 2009)). So those judgments warrant particularly deferential judicial review. *Id.*

### 3. Other Exchanges’ Risk-mitigation Tools

The Commission also reasonably explained why the ORP is consistent with risk protections it approved for other exchanges. The Approval Order notes that, like IEX Options, other exchanges

confer risk protections on market makers without imposing additional obligations on them. 90 Fed. Reg. at 45877 col.3 & n.266.

And, the Commission reasoned, the ORP will keep more liquidity in the market than those other risk-mitigation tools do. Many exchanges' risk-mitigation tools cancel all quotes for a given options "class"—all combinations of buy or sell, price, and expiration date for an underlying security like Flux Capacitors R Us stock. *Id.* at 45877 col.3. When those tools are in effect, an investor would be unable to trade with that market maker for any options based on Flux Capacitors R Us stock until the market maker sends in new quotes.

In contrast, the ORP reprices or cancels only a specific series within a class, like an option giving the right to buy Flux Capacitors R Us stock at \$60.00 by August 31, 2026. *Id.* at 45877 col.3. The Commission reasonably explained its view that this difference makes the ORP more precisely targeted to latency arbitrage than other risk-mitigation tools. IEX's model keeps more liquidity available from "the primary source of options liquidity to the market"—market makers. *Id.* at 45877 col.3–45878 col.1.

Citadel tries in two ways to distinguish the ORP from other exchanges' risk protections. First, Citadel asserts that the ORP is nothing like "safeguards designed to prevent catastrophic error or system failure."

But this argument ignores the Approval Order's discussion of "activity-based" risk protections. *See id.* at 45870 col.3, 45873 col.3. The Commission has approved other exchanges' activity-

based risk limits that cancel a market maker's quotes for an option when the number of executed trades for that option exceeds a preset volume or percentage of the market maker's orders executed during a time interval. *See, e.g.*, 87 Fed. Reg. 5592, 5625 cols.2–3 (Feb. 1, 2022) (approving activity-based risk controls for options trading on NYSE Arca, Inc.). So Citadel's premise, that the Commission has approved only "[t]raditional risk tools" that cancel all outstanding orders or halt trading on an exchange-wide basis, is wrong. The Commission reasonably concluded that approving the ORP is consistent with its prior precedent of approving other exchanges' risk-mitigation rules. *See* 90 Fed. Reg. at 45878 cols.2–3.

Second, Citadel contends that the ORP uniquely allows market makers to cancel offers that a liquidity taker is attempting to accept because, on a "trade-specific basis," the price is unfavorable to the market maker. But that's not how the ORP works. The ORP cancels stale quotes without regard to whether any trader is attempting to trade against those quotes.

***D. The Commission reasonably concluded that IEX Options will not impose an undue burden on competition.***

The last issue we must resolve relates to the Commission's conclusion that the IEX Proposal doesn't "impose any burden on competition not necessary or appropriate in furtherance of the purposes of [the Exchange Act]." 15 U.S.C. § 78f(b)(8).

Citadel raises four reasons to conclude that the Commission's conclusion was arbitrary and capricious: two procedural and

two substantive. We address each asserted reason in turn. But under our deferential review, none of Citadel's arguments succeed.

### 1. *Procedural Concerns*

Citadel's first procedural argument relies on *American Equity Investment Life Insurance Co. v. SEC*, 613 F.3d 166 (D.C. Cir. 2010). In Citadel's view, *American Equity* teaches that "[d]etermining whether a burden on competition is 'necessary or appropriate' under Section 6(b)(8) [of the Exchange Act] naturally requires assessing first the competitive conditions that already exist." And, Citadel continues, *American Equity* requires the Commission to make an expansive set of factual findings to establish a competitive "baseline" before acting.

We aren't convinced. Beyond being an out-of-circuit decision, *American Equity* had nothing to do with Section 6(b)(8) of the Exchange Act, 15 U.S.C. § 78f(b)(8), which is at issue here. Rather, *American Equity* addressed Section 2(b) of the Exchange Act, which applies to SEC rulemaking. *See* 613 F.3d at 176–78. Unlike Section 6(b)(8), Section 2(b) requires the Commission to consider "whether the action will promote efficiency, competition, and capital formation." 15 U.S.C. § 77b(b). And rulemaking doesn't operate under a tight time limit like the 45 (or 90) days to review exchanges' proposed rules.

Nor do we read *American Equity* the way that Citadel does. In that case, the Commission had determined that its rule would

be procompetitive by increasing disclosure of fixed indexed annuities' terms. *Am. Equity*, 613 F.3d at 178. More price transparency, the Commission reasoned, meant more competition. *Id.* But the Commission refused to consider whether state laws already required the same level of price transparency. *See id.* So the court faulted the Commission for failing to “assess the baseline level of price transparency and information disclosure under state law.” *Id.* (emphasis added). That’s one factor that affects competition. But we see no general requirement in *American Equity* to benchmark every aspect of competition in a market before issuing an order.

Citadel’s second procedural argument never gets off the starting blocks. On reply, Citadel proposes that the Commission must consider “less intrusive alternatives” before concluding that a burden on competition is “appropriate.” But Citadel never raised this argument in its opening brief. At most, it alluded to the “less intrusive alternative” concept in its Statement of the Case.

A litigant forfeits an issue if she does not “‘plainly and prominently’ raise it in her opening brief.” *LaCourse v. PAE Worldwide Inc.*, 980 F.3d 1350, 1360 (11th Cir. 2020) (quoting *Access Now, Inc. v. Sw. Airlines Co.*, 385 F.3d 1324, 1330 (11th Cir. 2004)). “[S]cattered references” in the background section of an opening brief do not raise a legal issue clearly enough to avoid forfeiture. *Id.* So Citadel forfeited this argument.

And even if Citadel had properly raised the issue, it would fail. Legally, Citadel provides no authority showing that the Com-

mission must assess “less intrusive alternatives” here. That requirement would fit uneasily with the Commission’s obligation to provide a quick up-or-down answer on a discrete rule proposal. 15 U.S.C. § 78s(b)(2). Plus, Citadel’s view would clash with the subsidiary role of competition in the Exchange Act. The statute gives no cause to hold that “the Commission must achieve its objectives in the least anticompetitive manner possible.” *Bradford Nat’l Clearing Corp. v. SEC*, 590 F.2d 1085, 1105 (D.C. Cir. 1978).

Worse, Citadel doesn’t establish that its proposed less intrusive alternatives were even possible. The only comment Citadel cites spelling out the alternatives—its own—proposed that the Commission should do one of two things. The Commission could (a) “clarify[]” that quotes subject to the ORP are non-firm under the Options Plan or (b) amend the Options Plan to carve out IEX Options from mandatory order routing. *See* App’x at A131. But again, quotes subject to the ORP don’t meet the Options Plan’s definition of non-firm quotations. And the Commission doesn’t have discretion to issue a legally erroneous “clarification.” Citadel also identifies no statute authorizing the Commission to pause the clock on its rule-proposal review while it embarks on a rewrite of a foundational regulation like the Options Plan.

## 2. *Substantive Concerns*

Next, we turn to Citadel’s substantive arguments. We think the Commission reasonably concluded that the IEX Proposal would increase, not burden, competition. We need decide no more

to reject Citadel's competition-related arguments. But the Commission also explained its view that the IEX Proposal would further the Exchange Act's goals. Both reasons support the Commission's determination that the IEX Proposal doesn't impose any burden on competition that isn't necessary or appropriate to further the Exchange Act's purposes. 15 U.S.C. § 78f(b)(8). So under the arbitrary-and-capricious standard, we reject Citadel's challenge to this part of the Approval Order.

Our analysis proceeds in three parts. We first address competition among exchanges, then among market makers, and we finish with the purposes of the Exchange Act.

a. Competition Among Exchanges

Citadel repeatedly urges that other exchanges "cannot compete" against a venue with an access delay and price-update tool like IEX Options.

But IEX's experience in the equities market dispels Citadel's fears. As we've mentioned, IEX directly modeled IEX Options on IEX's equities offering. Both feature an identical 350-microsecond access delay and substantially similar tools to cancel or reprice quotes in fleeting moments of price instability. And like IEX Options's quotes, IEX's equity quotes are protected, too. Yet IEX holds only a three-percent market share among equities exchanges. *See* 90 Fed. Reg. at 45879 col.2. That's nothing to sneeze at, but it's no sign that other exchanges cannot compete.

The Commission persuasively explained that options exchanges can continue to compete “through functionality, fees, or otherwise.” *Id.* at 45879 col.2. Additionally, real-world experience in the equities market saw at least one other equities exchange introduce a similar access delay after IEX launched. To “stimulate matching innovation by others” is “the very essence of competition.” *FTC v. Procter & Gamble Co.*, 386 U.S. 568, 598 (1967) (Harlan, J., concurring). In sum, the Commission gave a satisfactory explanation for rejecting commenters’ fears that the IEX Proposal would unduly burden competition among options exchanges.

b. Competition Among Market Makers

Citadel also contends that the IEX Proposal will harm competition among market makers. It complains that IEX Options would simply “subsidize market makers that decline to modernize” by investing in ultra-high-speed trading technology.

The Commission reached a different conclusion and provided reasonable grounds for its view. The Approval Order states the ORP will “facilitate competition between market makers” by addressing the disincentive that latency arbitrage poses to being a market maker. 90 Fed. Reg. at 45872 col.2. Not only that, but the Commission also expressed its expectation that the ORP will result in “increased competition and liquidity provision by the primary source of options liquidity to the market,” meaning market makers. *Id.* at 45878 col.1.

The Commission had a robust basis to conclude that limiting latency arbitrage would spur market makers to add more quotes at better prices. *See* App’x at A139–40 (Maven Securities); Suppl. App’x at SA52 (CTC, LLC); App’x at A76 (HAP Trading LLC). And it goes without saying that adding pressure to offer better prices promotes competition. *See Jacobs v. Tempur-Pedic Int’l, Inc.*, 626 F.3d 1327, 1339 (11th Cir. 2010). So, too, does increasing the number of quotes. *Nat’l Collegiate Athletic Ass’n v. Bd. of Regents of Univ. of Okla.*, 468 U.S. 85, 103 (1984) (noting that increased output in a market is procompetitive).

Commenters said that the ORP would lower “technological barriers to entry” and bring more competitors into the market. 90 Fed. Reg. at 45877 col.1. These are procompetitive outcomes, as well. *See FTC v. Univ. Health, Inc.*, 938 F.2d 1206, 1219 (11th Cir. 1991) (discussing barriers to entry); *United States v. Apple, Inc.*, 791 F.3d 290, 331 (2d Cir. 2015) (discussing potential benefits of new entrants to market). And the Commission considered these comments.

Conversely, the Commission had grounds to conclude that latency arbitrage is part of a negative-sum “technological arms race” that harms competition. 90 Fed. Reg. at 45874 col.3, 45877 col.2. Competition, after all, is “a process of rivalry that incentivizes businesses to offer lower prices, improve wages and working conditions, enhance quality and resiliency, innovate, and expand choice” for their trading partners. U.S. Dep’t of Just. & Fed. Trade

Comm'n, *Merger Guidelines* 1 § 1 (2023), <https://www.justice.gov/atr/media/1329301/dl> [<https://perma.cc/V4WJ-XKST>]. But evidence in the record shows that the status quo latency-arbitrage arms race *raises* prices and *reduces* liquidity for options investors—the opposite of what we'd expect from healthy competition. See App'x at A139–40 (Maven Securities); Suppl. App'x at SA52 (CTC, LLC); App'x at A76 (HAP Trading LLC). And according to the record, ordinary investors aren't clamoring for their trades to execute a millionth of a second faster. See 90 Fed. Reg. at 45880 col.1.

To be sure, Citadel's competitive position may worsen if other market makers can compete more vigorously and latency arbitrageurs can no longer take advantage of stale prices. But that's beside the point. The Commission evaluates burdens on *competition*, not threats to the position of a single *competitor*. See *Nasdaq Stock Mkt. LLC v. SEC*, 34 F.4th 1105, 1113 (D.C. Cir. 2022).

We need not decide whether the Commission's competitive assessment is the best possible reading of the evidence. The APA directs us to ask merely whether the Commission's conclusion was arbitrary and capricious. It was not. The Commission reasonably concluded that the IEX Proposal would increase competition among market makers.

c. Purposes of the Exchange Act

The Commission's reasonable rejection of commenters' concerns that the IEX Proposal would burden competition is

enough to resolve this issue. Without a burden on competition, there can't be a competitive burden that isn't "necessary or appropriate" to further the Exchange Act's purposes. 15 U.S.C. § 78f(b)(8).

But even if Citadel could show that the IEX Proposal burdened competition, Citadel would falter at the next step. The Commission had a sound basis to decide that promoting other goals of the Exchange Act outweighed any burdens on competition.

The Commission concluded that the ORP should "increase . . . liquidity at competitive prices, which facilitates fair competition and economically efficient executions for investors." 90 Fed. Reg. at 45872 col.2. Efficient trade execution is a core goal of the Exchange Act. See 15 U.S.C. §§ 78c(f), 78k-1(a)(1)(C)(i). Given the Commission's expertise in this complex area, we cannot fault it for crediting market makers' views that reducing latency arbitrage will lead to more liquidity—and thus more efficient execution. And for the reasons we've already reviewed, the Commission reasonably explained its view that the IEX Proposal would promote fair competition among market makers. See *id.* §§ 78c(f), 78f(b)(5).

Finally, the Approval Order furthers the Exchange Act's concern for "the protection of investors." *Id.* §§ 78c(f), 78k-1(a)(1)(C). Preventing the most well-resourced market participants from extracting a "surcharge" from retail investors, *Citadel Sec.*, 45 F.4th at 37, promotes that goal. So, too, does allowing investors to have access to greater liquidity, "potentially at improved prices." 90 Fed. Reg. at 45879 col.2.

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In short, we readily conclude that the Commission’s undue-burden conclusion falls “within a zone of reasonableness” after it “considered the relevant issues and reasonably explained [its] decision.” *Prometheus Radio*, 592 U.S. at 423.

#### IV. CONCLUSION

For the reasons we have discussed, Citadel’s petition for review of the Approval Order is **DENIED**.