In the

United States Court of Appeals

For the Seventh Circuit

No. 16-3017

UNITED STATES OF AMERICA,

Plaintiff-Appellee,

v.

MICHAEL COSCIA,

Defendant-Appellant.

Appeal from the United States District Court for the Northern District of Illinois, Eastern Division.
No. 1:14-cr-00551-1 — **Harry D. Leinenweber**, *Judge*.

ARGUED NOVEMBER 10, 2016 — DECIDED AUGUST 7, 2017

Before RIPPLE, MANION, and ROVNER, *Circuit Judges*.

RIPPLE, *Circuit Judge*. Today most commodities trading takes place on digital markets where the participants utilize computers to execute hyper-fast trading strategies at speeds, and in volumes, that far surpass those common in the past.

This case involves allegations of spoofing[1] and commodities fraud in this new trading environment. The Government alleged that Michael Coscia commissioned and utilized a computer program designed to place small and large orders simultaneously on opposite sides of the commodities market in order to create illusory supply and demand and, consequently, to induce artificial market movement. Mr. Coscia was charged with violating the anti-spoofing provision of the Commodity Exchange Act, 7 U.S.C. §§ 6c(a)(5)(C) and 13(a)(2), and with commodities fraud, 18 U.S.C. § 1348(1). He was convicted by a jury and later sentenced to thirty-six months' imprisonment.[2]

Mr. Coscia now appeals.[3] He submits that the anti-spoofing statute is void for vagueness and, in any event, that the evidence on that count did not support conviction. With respect to the commodities fraud violations, he submits that the Government produced insufficient evidence and that the trial court applied an incorrect materiality standard. Finally, he contends that the district court erred in adjudicating his sentence by adding a fourteen-point loss enhancement.

We cannot accept these submissions. The anti-spoofing provision provides clear notice and does not allow for arbitrary enforcement. Consequently, it is not unconstitutionally vague. Moreover, Mr. Coscia's spoofing conviction is sup-

[1] The term "spoofing," as will be explained in greater detail below, is defined as "bidding or offering with the intent to cancel the bid or offer before execution." 7 U.S.C. § 6c(a)(5)(C).

[2] The district court had jurisdiction over this case under 18 U.S.C. § 3231.

[3] We have jurisdiction over this appeal under 28 U.S.C. § 1291.

ported by sufficient evidence. With respect to the commodities fraud violation, there was more than sufficient evidence to support the jury's verdict, and the district court was on solid ground with respect to its instruction to the jury on materiality. Finally, the district court did not err in applying the fourteen-point loss enhancement.

I

BACKGROUND

A.

The charges against Mr. Coscia are based on his use of preprogrammed algorithms to execute commodities trades in high-frequency trading.[4] This sort of trading "is a mechanism for making large volumes of trades in securities and commodities based on trading decisions effected in fractions of a second."[5] Before proceeding with the particular facts of this case, we pause to describe the trading environment in which these actions took place.

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[4] Mr. Coscia's opening brief conflates algorithmic trading and high-frequency trading. *See* Appellant's Br. 5. High-frequency trading, or HFT, is perhaps better conceptualized as "a subset of algorithmic trading." Tara E. Levens, Comment, *Too Fast, Too Frequent? High-Frequency Trading and Securities Class Actions*, 82 U. Chi. L. Rev. 1511, 1527 (2015).

[5] *United States v. Aleynikov*, 676 F.3d 71, 73 (2d Cir. 2012); *see also United States v. Aleynikov*, 737 F. Supp. 2d 173, 175 (S.D.N.Y. 2010) (explaining that HFT "involves the rapid execution of high volumes of trades in which trading decisions are made by sophisticated computer programs that use complex mathematical formulae known as algorithms"); *United States v. Pu*, 814 F.3d 818, 821 (7th Cir. 2016) (defining HFT as "the rapid buying and selling of publicly traded stocks").

The basic process at the core of high-frequency trading is fairly straightforward: trading firms use computer software to execute, at very high speed, large volumes of trades. A number of *legitimate* trading strategies can make this practice very profitable. The simplest approaches take advantage of the minor discrepancies in the price of a security or commodity that often emerge across national exchanges. These price discrepancies allow traders to arbitrage between exchanges by buying low on one and selling high on another. Because any such price fluctuations are often very small, significant profit can be made only on a high volume of transactions. Moreover, the discrepancies often last a very short period of time (i.e., fractions of a second); speed in execution is therefore an essential attribute for firms engaged in this business.[6]

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[6] The Southern District of New York has noted that "[s]ome commentators and, at points, the SEC, have stated that HFT firms have a positive effect on the market by creating significant amounts of liquidity, thereby permitting the national stock market to operate more efficiently and benefitting ordinary investors." *In re Barclays Liquidity Cross & High Frequency Trading Litig.*, 126 F. Supp. 3d 342, 350 (S.D.N.Y. 2015).

Nonetheless, HFT is not unambiguously good. Rather, some have

> sharply criticized the HFT firms' trading practices. Chief among their criticisms … is that the HFT firms use the speed at which they are capable of trading to identify the trading strategies being pursued by ordinary investors and react in a manner that forces ordinary investors to trade at a less advantageous price, with the HFT firm taking as profit a portion of the "delta"—that is, the difference between the price at which the ordinary investor would have traded and the price at which it actually traded as a result of the HFT firm's actions.

Although high-frequency trading has legal applications, it also has increased market susceptibility to certain forms of criminal conduct. Most notably, it has opened the door to spoofing, which Congress criminalized in 2010 as part of the Dodd-Frank Wall Street Reform and Consumer Protection Act, Pub. L. No. 111-203, 124 Stat. 1376 (2010). The relevant provision proscribes "any trading, practice, or conduct that … is, is of the character of, or is commonly known to the trade as, 'spoofing' (bidding or offering with the intent to cancel the bid or offer before execution)." 7 U.S.C. § 6c(a)(5).[7] For present purposes, a bid is an order to buy and an offer is an order to sell.

In practice, spoofing, like legitimate high-frequency trading, utilizes extremely fast trading strategies. It differs from legitimate trading, however, in that it can be employed to *artificially move* the market price of a stock or commodity up and down, instead of taking advantage of natural market events (as in the price arbitrage strategy discussed above). This artificial movement is accomplished in a number of ways, although it is most simply realized by placing large and small orders on opposite sides of the market. The small order is placed at a desired price, which is either above or below the current market price, depending on whether the trader wants to buy or sell. If the trader wants to buy, the price on the small batch will be lower than the market price; if the trader wants

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Id.

[7] The provision has almost no legislative history. The only meaningful reference reads as follows: "The CFTC requested, and received, enforcement authority with respect to insider trading, restitution authority, and *disruptive trading practices*." 156 Cong. Rec. S5992 (daily ed. July 15, 2010) (statement of Sen. Lincoln) (emphasis added).

to sell, the price on the small batch will be higher. Large orders are then placed on the opposite side of the market at prices designed to shift the market toward the price at which the small order was listed.

For example, consider an unscrupulous trader who wants to *buy* corn futures at $3.00 per bushel in a market where the current price is $3.05 per bushel. Under the basic laws of supply and demand, this trader can drive the price downward by placing *sell* orders for large numbers of corn futures on the market at incrementally decreasing prices (e.g., $3.04, then $3.03, etc.), until the market appears to be saturated with individuals wishing to sell, the price decreases, and, ultimately, the desired purchase price is reached. In short, the trader shifts the market downward through the illusion of downward market movement resulting from a surplus of supply. Importantly, the large, market-shifting orders that he places to create this illusion are ones that he never intends to execute; if they were executed, our unscrupulous trader would risk extremely large amounts of money by selling at suboptimal prices. Instead, within milliseconds of achieving the desired downward market effect, he cancels the large orders.

Once our unscrupulous trader has acquired the commodity or stock at the desired price, he can then *sell* it at a higher price than that at which he purchased it by operating the same scheme in reverse. Specifically, he will place a small sell order at the desired price and then place large buy orders at increasingly high prices until the market appears flooded with demand, the price rises, and the desired value is hit. Returning to the previous example, if our unscrupulous trader wants to sell his corn futures (recently purchased at $3.00 per bushel) for $3.10 per bushel, he will place large buy orders beginning at the market rate ($3.00), quickly increasing that dollar value (e.g., $3.01, then $3.02, then $3.03, etc.), creating an appearance of exceedingly high demand for corn futures, which raises the price, until the desired price is hit. Again, the large orders will be on the market for incredibly short periods of time (fractions of a second), although they will often occupy a large portion of the market in order to efficiently shift the price.

B.

On October 1, 2014, a grand jury indicted Mr. Coscia for spoofing and commodities fraud based on his 2011 trading activity. Prior to trial, he moved to dismiss the indictment, arguing that the anti-spoofing provision was unconstitutionally vague. He further argued that he did not commit commodities fraud as a matter of law. The district court rejected both arguments.

Trial began on October 26, 2015, and lasted seven days. The testimony presented at trial explained that the relevant conduct began in August of 2011, lasted about ten weeks, and followed a very particular pattern. When he wanted to purchase, Mr. Coscia would begin by placing a small order requesting to trade at a price below the current market price. He then would place large-volume orders, known as "quote orders,"[8] on the other side of the market. A small order could be as small as five futures contracts, whereas a large order would represent as many as fifty or more futures contracts. At times,

[8] Government's Br. 3.

his large orders risked up to $50 million.[9] The large orders were generally placed in increments that quickly approached the price of the small orders.

Mr. Coscia's specific activity in trading copper futures helps to clarify this dynamic. During one round of trading, Mr. Coscia placed a small sell order at a price of 32755,[10] which was, at that time, higher than the current market price.[11] Large orders were then placed on the opposite side of the market (the buy side) at steadily growing prices, which started at 32740, then increased to 32745, and increased again to 32750.[12] These buy orders created the illusion of market movement, swelling the perceived value of any given futures contract (by fostering the illusion of demand) and allowing Mr. Coscia to sell his current contracts at the desired price of 32755—a price equilibrium that he created.

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9 R.88 at 94 (Tr. 699); R.90 at 66–67 (Tr. 1042–43).

10 As explained at trial:

> The tick size for copper futures is one-half of one-thousandth of a cent. So for purposes of the way these prices are here, the tick size is an increment of five. …
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> ….
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> … [N]umerical increments of five … represent one tick, so a five amount increase in the number is one tick in the copper futures.

R.89 at 63 (Tr. 820). In other words, increments of five represent (at least for copper futures) one-half of one-thousandth of a cent.

11 *Id*. at 63–65 (Tr. 820–22); R.177-24.

12 R.177-24; R.89 at 64–65 (Tr. 821–22).

Having *sold* the five contracts for 32755, Mr. Coscia now needed to *buy* the contracts at a lower price in order to make a profit. Accordingly, he first placed an order to buy five copper futures contracts for 32750, which was below the price that he had just created.[13] Second, he placed large-volume orders on the opposite side of the market (the sell side), which totaled 184 contracts. These contracts were priced at 32770, and then 32765, which created downward momentum on the price of copper futures by fostering the appearance of abundant supply at incrementally decreasing prices. The desired devaluation of the contracts was almost immediately achieved, allowing Mr. Coscia to buy his small orders at the artificially deflated price of 32750. The large orders were then immediately cancelled.[14] The whole process outlined above took place in approximately two-thirds of a second, and was repeated tens of thousands of times, resulting in over 450,000 large orders, and earning Mr. Coscia $1.4 million. All told, the trial evidence suggested that this process allowed Mr. Coscia to buy low and sell high in a market artificially distorted by his actions.

The Government also introduced evidence regarding Mr. Coscia's intent to cancel the large orders prior to their execution. The primary items of evidence in support of this allegation were the two programs that Mr. Coscia had commissioned to facilitate his trading scheme: Flash Trader and Quote Trader. The designer of the programs, Jeremiah Park, testified that Mr. Coscia asked that the programs act "[l]ike a

[13] R.177-24; R.89 at 66–67 (Tr. 823–24).

[14] R.177-24; R.89 at 65–67 (Tr. 822–24).

decoy," which would be "[u]sed to pump [the] market."[15] Park interpreted this direction as a desire to "get a reaction from the other algorithms."[16] In particular, he noted that the large-volume orders were designed specifically to avoid being filled and accordingly would be canceled in three particular circumstances: (1) based on the passage of time (usually measured in milliseconds); (2) the partial filling of the large orders; or (3) complete filling of the small orders.[17]

A great deal of testimony was presented at trial to support the contention that Mr. Coscia's programs functioned within their intended parameters. For example, John Redman, a director of compliance for Intercontinental Exchange, Inc.,[18] testified that Mr. Coscia

> would place a small buy or sell order in the market, and then immediately after that, he would place a series of much larger opposite orders in the market, progressively improving price levels toward the previous order that he placed. That small initial order would trade, and then the large order would be canceled and be replaced by a

[15] R.86 at 231 (Tr. 498), at 235 (Tr. 502).

[16] *Id*. at 235 (Tr. 502).

[17] R.87 at 71–72 (Tr. 577–78).

[18] Mr. Coscia used his algorithms on both the Chicago Mercantile Exchange and the Intercontinental Exchange, although he was charged only for his conduct on the Chicago Mercantile Exchange. Nonetheless, the indictment also does mention the Intercontinental Exchange trading and a substantial amount of information related to that trading was offered at trial.

> small order, and the large orders in the opposite direction will have previously taken place.[19]

Redman further testified that Mr. Coscia placed 24,814 large orders between August and October 2011, although he only traded on 0.5% of those orders.[20] During this same period he placed 6,782 small orders on the Intercontinental Exchange and approximately 52% of those orders were filled.[21] Mr. Redman additionally explained that this activity made the small orders "100 times" more likely to be filled than the large-volume orders.[22] Mr. Redman made clear that this was highly unusual:

> What we normally see is people placing orders of roughly the same size most of the time and, therefore, there aren't two order sizes in use with a different cancellation rate between them. There's just one order size in use and the cancellation rate is, there's just one.[23]

[19] R.82 at 254 (Tr. 254).

[20] R.86 at 22 (Tr. 289).

[21] *Id.* at 23–24 (Tr. 290–91).

[22] *Id.* at 24 (Tr. 291).

[23] *Id.* at 25 (Tr. 292); *see also id.* at 85 (Tr. 352) ("Mr. Coscia was the only person we looked at in this time frame who would put in small orders with one cancellation rate and big orders with a completely different cancellation rate. That was unusual.").

Finally, Mr. Redman also noted that Mr. Coscia's order-to-fill ratio (i.e., the average size of the order he showed to the market divided by the average size of the orders filled)[24] was approximately 1,600%, whereas other traders generally presented ratios of between 91% and 264%.[25]

Other traders testified to the effect of Mr. Coscia's trading on their businesses. For example, Anand Twells of Citadel, LLC, explained that his firm lost $480 in 400 milliseconds as a result of trading with Mr. Coscia.[26] Similarly, Hovannes Dermenchyan of Teza Technologies testified that he "lost $10,000 over the course of an hour" of trading with Mr. Coscia.[27] Finally, Alexander Gerko of XTX Markets described how his firm "probably lost low hundreds of thousands of dollars" as a result of Mr. Coscia's actions.[28]

The Government also introduced Mr. Coscia's prior testimony from a deposition taken by the Commodity Futures Trading Commission. In that deposition, Mr. Coscia explained the logic behind his trading as follows:

> The logic is I wanted to make a program with two sides. I noticed there was more trading done when one side was larger than the other,

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[24] *See id.* at 28 (Tr. 295); *see also infra* at 26–27.

[25] *See* R.86 at 30–33 (Tr. 297–300).

[26] R.88 at 30 (Tr. 635).

[27] *Id.* at 51 (Tr. 656).

[28] *Id.* at 105 (Tr. 710).

> and I made a program to make a market as tight as possible with different lopsided markets.
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> ….
>
> I watched the screen, and through watching the screen for years or weeks, I noticed that when there was a larger order and smaller order, a lopsided market, there was more of a tendency for trading to occur.[29]

When pressed on why he designed the program to cancel when the large orders risked being filled, without placing similar parameters on the small orders, Mr. Coscia simply stated "[t]hat's just how it was programmed. I don't give it much thought beyond that."[30] At trial, Mr. Coscia further testified that, "Obviously, there's less risk there. I thought it was common sense. But I should have given more of an explanation."[31] Ultimately, as explained by his counsel in summation, Mr. Coscia's defense was that he "placed real orders that were exactly that, orders that were tradeable."[32]

The jury convicted Mr. Coscia on all counts. Mr. Coscia then filed a motion for acquittal. The district court denied the motion in a memorandum opinion and order issued on April 6, 2016. The district court determined that the evidence was sufficient to prove that Mr. Coscia committed commodities

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29 R.87 at 52 (Tr. 558).

30 *Id.* at 61 (Tr. 567).

31 R.89 at 168 (Tr. 925).

32 R.92 at 59 (Tr. 1472).

fraud and that his deception was material. Moreover, with respect to the spoofing charge, the court held that the statute was not void for vagueness. Finally, the court denied a challenge to the definition of materiality provided in the commodities fraud jury instructions.

Thereafter, the district court, applying a fourteen-point enhancement for the estimated loss attributable to the illegal actions, sentenced Mr. Coscia to thirty-six months' imprisonment to be followed by two years' supervised release.

II

DISCUSSION

A.

We begin with Mr. Coscia's contention that the anti-spoofing provision is unconstitutionally vague. For the convenience of the reader, we set forth the statutory provision in its entirety:

> **(5) Disruptive practices**
>
> It shall be unlawful for any person to engage in any trading, practice, or conduct on or subject to the rules of a registered entity that—
>
> …
>
> **(C)** is, is of the character of, or is commonly known to the trade as, "spoofing" (bidding or offering with the intent to cancel the bid or offer before execution).

7 U.S.C. § 6c(a)(5). The Fifth Amendment's guarantee that "[n]o person shall … be deprived of life, liberty, or property, without due process of law" forbids vague criminal laws. U.S. Const. amend. V.; *Johnson v. United States*, 135 S. Ct. 2551, 2556 (2015). This constitutional proscription gives rise to the general rule that "prohibits the government from imposing sanctions under a criminal law so vague that it fails to give ordinary people fair notice of the conduct it punishes, or so standardless that it invites arbitrary enforcement." *Welch v. United States*, 136 S. Ct. 1257, 1262 (2016) (internal quotation marks omitted). We review a challenge to a statute's constitutionality, including vagueness challenges, de novo. *See United States v. Leach*, 639 F.3d 769, 772 (7th Cir. 2011).

1.

Mr. Coscia first submits that the statute gives inadequate notice of the proscribed conduct. He submits that Congress did not intend the parenthetical included in the statute to define spoofing.[33] Mr. Coscia contends that, by "placing 'spoofing' in quotation marks and referring to a 'commonly known' definition in the trade, Congress clearly signaled its (mistaken) belief that the definition of 'spoofing' had been established in the industry as a term of art."[34] In support of this argument, he further submits that this statutory structure

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[33] Appellant's Br. 40.

[34] *Id.*

mirrors the "wash sale" provision of the Commodity Exchange Act[35] and that this "parallel approach in statutory structure strongly suggests that Congress intended for the 'spoofing' definition, like the 'wash sale' definition, to be established by sources outside the statutory text."[36] We cannot accept this argument; it overlooks that the anti-spoofing pro-

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[35] 7 U.S.C. § 6c(a) provides, in relevant part:

> **(1) Prohibition**
>
> It shall be unlawful for any person to offer to enter into, enter into, or confirm the execution of a transaction described in paragraph (2) involving the purchase or sale of any commodity for future delivery (or any option on such a transaction or option on a commodity) or swap if the transaction is used or may be used to—
>
> > **(A)** hedge any transaction in interstate commerce in the commodity or the product or byproduct of the commodity;
> >
> > **(B)** determine the price basis of any such transaction in interstate commerce in the commodity; or
> >
> > **(C)** deliver any such commodity sold, shipped, or received in interstate commerce for the execution of the transaction.
>
> **(2) Transaction**
>
> A transaction referred to in paragraph (1) is a transaction that—
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> > **(A)(i)** is, of the character of, or is commonly known to the trade as, a "wash sale" or "accommodation trade"; ….

[36] Appellant's Br. 41.

vision, unlike the wash sale provision, contains a parenthetical definition, rendering any reference to an industry definition irrelevant.[37]

Relying on *Chickasaw Nation v. United States*, 534 U.S. 84 (2001), Mr. Coscia next submits that the "use of parentheses emphasizes the fact that that which is within is meant simply to be illustrative," *id.* at 89. The provision at issue in *Chickasaw Nation*, a portion of the Indian Gaming Regulatory Act, Pub. L. No. 100-497, 102 Stat. 2467 (1988), referred to "[t]he provisions of Title 26 (*including* sections 1441, 3402(q), 6041, and 6050I, and chapter 35 of such title)." 25 U.S.C. § 2719(d)(1) (emphasis added). The anti-spoofing statute, on the other hand, reads:

> It shall be unlawful for any person to engage in any trading, practice, or conduct on or subject to the rules of a registered entity that—
>
> …
>
> (C) is, is of the character of, or is commonly known to the trade as, "spoofing" (bidding or offering with the intent to cancel the bid or offer before execution).

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[37] *Compare* 7 U.S.C. § 6c(a)(5) (explaining that "any trading, practice, or conduct … that … is, is of the character of, or is commonly known to the trade as, 'spoofing' *(bidding or offering with the intent to cancel the bid or offer before execution)*" is illegal) (emphasis added), *with id.* § 6c(a)(2)(A)(i) (outlining the wash sale provision, which prohibits any transaction that "is, of the character of, or is commonly known to the trade as, a 'wash sale' or 'accommodation trade'").

7 U.S.C. § 6c(a)(5). Comparing the statutes, it is clear that, in the Indian Gaming Regulatory Act, the use of the word "including" rendered the parenthetical illustrative. The anti-spoofing provision, however, has no such language and is thus meaningfully different. The Supreme Court has read parenthetical language like the language before us today as definitional instead of illustrative. *See, e.g.*, *Lopez v. Gonzales*, 549 U.S. 47, 52–53 (2006).[38] In any event, this argument does little to aid Mr. Coscia because, here, the charged conduct clearly falls within the ambit of the statute regardless whether the parenthetical is an example or a definition.

In the same vein, Mr. Coscia contends that the lack of a Commodity Futures Trading Commission regulation defining the contours of spoofing adds to his lack of notice. Nonetheless, the Supreme Court has explained that "the touchstone [of a fair warning inquiry] is whether the statute, either standing alone or as construed, made it reasonably clear at the relevant time that the defendant's conduct was criminal." *United States v. Lanier*, 520 U.S. 259, 267 (1997). Consequently, because the statute clearly defines "spoofing" in the parenthetical, Mr. Coscia had adequate notice of the prohibited conduct.

Mr. Coscia also makes a broader notice argument. He contends, in effect, that the absence of *any* guidance external to the statutory language—no legislative history, no recognized

[38] *Cf. Novacor Chems., Inc. v. United States*, 171 F.3d 1376, 1381 (Fed. Cir. 1999) (stating that "general principles of construction support the view that a parenthetical is the definition of the term which it follows").

industry definition, no Commodity Futures Trading Commission rule—leaves a person of ordinary intelligence to speculate about the definition Congress intended when it placed "spoofing" in quotation marks.[39] In support of this argument, Mr. Coscia relies on *Upton v. S.E.C.*, 75 F.3d 92 (2d Cir. 1996). In that case, the defendant had technically complied with the requirements of a rule, but the SEC took the position that his actions nevertheless violated the spirit and purpose of the rule. Prior to the issuance of an interpretive memorandum explaining that position, "[t]he Commission was aware that brokerage firms were evading the substance of Rule 15c3–3(e)." *Id.* at 98. Nonetheless, "[a]part from issuing one consent order carrying 'little, if any, precedential weight,' the Commission took no steps to advise the public that it believed the practice was questionable until August 23, 1989, after Upton had already stopped the practice." *Id.* (internal citation omitted). Accordingly, "[b]ecause there was substantial uncertainty in the Commission's interpretation of Rule 15c3–3(e)," the court held that "Upton was not on reasonable notice that [his] conduct might violate the Rule." *Id.*

The present situation is wholly different from the one in *Upton*. Here, Congress enacted the anti-spoofing provision specifically to stop spoofing—a term it defined in the statute. Accordingly, any agency inaction—the issue presented by *Upton*—is irrelevant; Congress provided the necessary definition and, in doing so, put the trading community on notice. *Lanier*, 520 U.S. at 267 (explaining that "the touchstone is whether the statute, either standing alone or as construed,

[39] Appellant's Br. 43.

made it reasonably clear at the relevant time that the defendant's conduct was criminal").

For the same reason, the arguments about a lack of industry definition or legislative history are irrelevant. The statute "standing alone" clearly proscribes the conduct; the term "spoofing" is defined in the statute. *Id.*[40]

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[40] In support of these arguments, Mr. Coscia contends that the district court's own interpretation of the anti-spoofing provision shifted throughout the proceedings and thus underscores the provision's inherent vagueness. The first passage to which he invites our attention is the district court's order denying the posttrial motion:

> The purpose is clear: to prevent abusive trading practices that artificially distort the market. That, in turn, only occurs when there is intent to defraud by placing illusory offers (or put another way, by placing offers with the intent to cancel them before execution).

R.124 at 8. The second passage is from the defendant's sentencing hearing where the district court noted that defendant "manipulated the market, that [his trading] caused the market for a specific lot to go up one tick and, therefore, he was able to sell high." R.162 at 9.

In context, neither of these passages is troubling. The first quote is taken from a larger discussion that explains how Congress limited the statute to manipulative cancellations:

> Coscia had fair notice. It would be unreasonable to believe that Congress had intended to criminalize all orders that are eventually cancelled at any point, for any reason, under 7 U.S.C. § 6c(a)(5)(C). The definition of spoofing must be read in conjunction with the companion statutory provision that actually criminalizes the conduct: [7] U.S.C. § 13(a)(2) prohibits the manipulation or attempted manipulation of commodity prices generally, and prohibits knowing violation of the anti-spoofing rule.

2.

Mr. Coscia next contends that, even if the statute gives adequate notice, the parenthetical definition encourages arbitrary enforcement. He specifically notes that high-frequency traders cancel 98% of orders before execution and that there are simply no "tangible parameters to distinguish [Mr.] Coscia's purported intent from that of the other traders."[41]

This argument does not help Mr. Coscia. The Supreme Court has made clear that "[a] plaintiff who engages in some conduct that is clearly proscribed cannot complain of the vagueness of the law as applied to the conduct of others."

> The purpose is clear: to prevent abusive trading practices that artificially distort the market. That, in turn, only occurs when there is intent to defraud by placing illusory offers (or put another way, by placing offers with the intent to cancel them before execution).

R.124 at 7–8. In short, the district court's point here is one that we already have made: the statute put Mr. Coscia on notice that, when he submitted offers with the purpose of cancelling them, his actions constituted spoofing for purposes of 7 U.S.C. § 6c(a)(5)(C), which is part of a larger statutory scheme to prevent manipulation of the market. As to the second quote, although a conviction for spoofing does not require any showing of market manipulation, it is clear that the purpose of spoofing is to artificially skew markets and accordingly make a profit. As a result, describing the purpose of the anti-spoofing provision as preventing practices that "artificially distort the market" is factually accurate. All told, neither statement—issued years after the defendant's actual conduct—suggests the statute failed to put the defendant on notice as to the illegality of his actions.

[41] Appellant's Br. 44–45.

Holder v. Humanitarian Law Project, 561 U.S. 1, 18–19 (2010) (alteration in original); *see also United States v. Morris*, 821 F.3d 877, 879 (7th Cir. 2016) ("Vagueness challenges to statutes that do not involve First Amendment interests are examined in light of the facts of the case at hand."). Rather, the defendant must prove that *his* prosecution arose from arbitrary enforcement. As explained by the Second Circuit, this inquiry "involve[s] determining whether the conduct at issue falls so squarely in the core of what is prohibited by the law that there is no substantial concern about arbitrary enforcement because no reasonable enforcing officer could doubt the law's application in the circumstances." *Farrell v. Burke*, 449 F.3d 470, 494 (2d Cir. 2006).

Mr. Coscia cannot claim that an impermissibly vague statute has resulted in arbitrary enforcement because his conduct falls well within the provision's prohibited conduct: he commissioned a program designed to pump or deflate the market through the use of large orders that were *specifically designed* to be cancelled if they ever risked actually being filled. His program would cancel the large orders (1) after the passage of time, (2) if the small orders were filled, or (3) if a single large order was filled. Read together, these parameters clearly indicate an intent to cancel, which was further supported by his actual trading record. Accordingly, because Mr. Coscia's behavior clearly falls within the confines of the conduct prohibited by the statute, he cannot challenge any allegedly arbitrary enforcement that could hypothetically be suffered by a theoretical legitimate trader.[42]

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[42] Mr. Coscia further contends that we should construe the anti-spoofing provision to only apply to orders placed and cancelled during pre-market

Moreover, even if Mr. Coscia could challenge the statute, we do not believe that it permits arbitrary enforcement. When we examine the possibility of a statute's being enforced arbitrarily, we focus on whether the statute "impermissibly delegates to law enforcement the authority to arrest and prosecute on 'an ad hoc and subjective basis.'" *Bell v. Keating*, 697 F.3d 445, 462 (7th Cir. 2012). In undertaking this inquiry, we have noted that, "[w]hen the government must prove intent and knowledge, these requirements … do much to destroy any force in the argument that application of the [statute] would be so unfair that it must be held invalid[.]" *United States v. Calimlim*, 538 F.3d 706, 711 (7th Cir. 2008) (second, third, and fourth alterations in original) (internal citations omitted). We also have underscored "that a statute is not vague simply because it requires law enforcement to exercise some degree of judgment." *Bell*, 697 F.3d at 462.

The text of the anti-spoofing provision requires that an individual place orders with "the intent to cancel the bid or offer before execution." 7 U.S.C. § 6c(a)(5)(C). This phrase imposes clear restrictions on whom a prosecutor can charge with spoofing; prosecutors can charge only a person whom they believe a jury will find possessed the requisite specific intent to cancel orders at the time they were placed. Criminal prosecution is thus limited to the pool of traders who exhibit the requisite criminal intent. This provision certainly does not "vest[] virtually complete discretion in the hands of the police." *Gresham v. Peterson*, 225 F.3d 899, 907 (7th Cir. 2000) (internal quotation marks omitted).

hours. We simply find no support for this argument in the statute's plain language, which is broad and unrestrained by any temporal limitations.

Importantly, the anti-spoofing statute's intent requirement renders spoofing meaningfully different from legal trades such as "stop-loss orders" ("an order to sell a security once it reaches a certain price")[43] or "fill-or-kill orders" ("an order that must be executed in full immediately, or the entire order is cancelled")[44] because those orders are designed to be executed upon the arrival of *certain subsequent events*. Spoofing, on the other hand, requires, an intent to cancel the order *at the time it was placed*.[45] The fundamental difference is that legal trades are cancelled only following a condition subsequent to placing the order, whereas orders placed in a spoofing scheme are never intended to be filled at all.

At bottom, Mr. Coscia's vagueness challenge fails. The statute clearly defines the term spoofing, providing sufficient notice. Moreover, Mr. Coscia's actions fall well within the core of the anti-spoofing provision's prohibited conduct, precluding any claim that he was subject to arbitrary enforcement. Furthermore, even if his behavior were not well within the core of the anti-spoofing provision's prohibited conduct, the statute's intent requirement clearly suggests that the statute does not allow for ad hoc or subjective prosecution.

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[43] Government's Br. 36.

[44] *Id.*

[45] Mr. Coscia's contention that "the Government perceives a distinction between orders placed with intent to *fill* under certain circumstances and those placed with intent to *cancel* under certain circumstances" is thus wholly inaccurate. Reply Br. 19 (emphasis in original). Mr. Coscia did not place orders with the intent to cancel *under certain circumstances*—he placed orders with the present intent to *always cancel* the large orders. His purpose was not to trade on those orders, but rather to use them to shift the market up or down.

B.

Having determined that the anti-spoofing provision is not void for vagueness, we next address Mr. Coscia's contention that the evidence of record does not support his spoofing conviction. "In reviewing a challenge to the sufficiency of the evidence, we view all the evidence and draw all reasonable inferences in the light most favorable to the prosecution and uphold the verdict if any rational trier of fact could have found the essential elements of the crime beyond a reasonable doubt." *United States v. Khattab*, 536 F.3d 765, 769 (7th Cir. 2008) (internal quotation marks omitted). "[We] will not … weigh the evidence or second-guess the jury's credibility determinations." *United States v. Stevens*, 453 F.3d 963, 965 (7th Cir. 2006) (citation omitted). Recognizing that "it is usually difficult or impossible to provide direct evidence of a defendant's mental state," we allow for criminal intent to be proven through circumstantial evidence. *United States v. Morris*, 576 F.3d 661, 674 (7th Cir. 2009).

As we have noted earlier, a conviction for spoofing requires that the prosecution prove beyond a reasonable doubt that Mr. Coscia knowingly entered bids or offers with the present intent to cancel the bid or offer prior to execution. Mr. Coscia's trading history clearly indicates that he cancelled the vast majority of his large orders. Accordingly, the only issue is whether a rational trier of fact could have found that Mr. Coscia possessed an intent to cancel the large orders at the time he placed them.

A review of the trial evidence reveals the following. First, Mr. Coscia's cancellations represented 96% of all Brent futures cancellations on the Intercontinental Exchange during the two-month period in which he employed his software.[46] Second, on the Chicago Mercantile Exchange, 35.61% of his small orders were filled, whereas only 0.08% of his large orders were filled.[47] Similarly, only 0.5% of his large orders were filled on the Intercontinental Exchange.[48] Third, the designer of the programs, Jeremiah Park, testified that the programs were designed to avoid large orders being filled.[49] Fourth, Park further testified that the "quote orders" were "[u]sed to pump [the] market," suggesting that they were designed to inflate prices through illusory orders.[50] Fifth, according to one study, only 0.57% of Coscia's large orders were on the market for more than one second, whereas 65% of large orders entered by other high-frequency traders were open for more than a second.[51] Finally, Mathew Evans, the senior vice president of NERA Economic Consulting, testified that Coscia's order-to-trade ratio was 1,592%, whereas the order-to-trade ratio for other market participants ranged from 91% to 264%.[52] As explained at trial, these figures "mean[] that Michael Coscia's average order [was] much larger than his average trade"—i.e., it further suggests that the large orders were

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[46] R.86 at 41 (Tr. 308).

[47] *Id.* at 127 (Tr. 394).

[48] *Id.* at 22 (Tr. 289).

[49] *See id*. at 198 (Tr. 465), at 231–32 (Tr. 498–99).

[50] *Id*. at 235 (Tr. 502).

[51] R.91 at 35–36 (Tr. 1281–82).

[52] *Id*. at 41 (Tr. 1287).

placed, not with the intent to actually consummate the transaction, but rather to shift the market toward the artificial price at which the small orders were ultimately traded.[53]

We believe that, given this evidence, a rational trier of fact easily could have found that, at the time he placed his orders, Mr. Coscia had the "intent to cancel before execution." As in all cases based upon circumstantial evidence, no single piece of evidence necessarily establishes spoofing. Nonetheless, when evaluated in its totality, the cumulative evidence certainly allowed a rational trier of fact to determine that Mr. Coscia entered his orders with the intent to cancel them before their execution.

C.

Mr. Coscia also challenges his conviction for commodities fraud under 18 U.S.C. § 1348(1). This statute makes it a crime "to defraud any person in connection with any commodity for future delivery." *Id.* The elements[54] of this crime are (1) fraudulent intent, (2) a scheme or artifice to defraud, and (3) a nexus

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53 *Id.*

54 Mr. Coscia proposes a different formulation of these elements, stating that "there must be (a) proof of deceptive conduct, and (b) proof that the deception is 'material.'" Appellant's Br. 26. Nonetheless, the case that he cites in support of this formulation actually employs the more widely accepted formulation that we have articulated above. *See United States v. Hatfield*, 724 F. Supp. 2d 321, 324 (E.D.N.Y. 2010) ("Under § 1348(1), the Government must provide sufficient evidence to establish that Mr. Brooks had (1) 'fraudulent intent'; (2) 'a scheme or artifice to defraud'; and (3) 'a nexus with a security.'").

with a security.[55] *United States v. Mahaffy*, 693 F.3d 113, 125 (2d Cir. 2012) (citing *United States v. Motz*, 652 F. Supp. 2d 284, 294 (E.D.N.Y. 2009)). "False representations or material omissions are not required" for conviction under this provision. *Id.*

Mr. Coscia contends that the jury could not reasonably have found that he had a fraudulent intent because his conduct was not fraudulent as a matter of law. He also contends that the court applied an incorrect materiality standard. We now turn to an examination of each of these submissions.

1.

We first address Mr. Coscia's view that the jury's finding of fraudulent intent was not supported by the evidence because his conduct was, as a matter of law, not deceptive. In reviewing challenges to the sufficiency of the evidence, we "uphold the verdict if any rational trier of fact could have found the essential elements of the crime beyond a reasonable doubt." *Khattab*, 536 F.3d at 769 (internal quotation marks omitted).

Mr. Coscia contends that because "his orders were fully executable and subject to legitimate market risk," they were not, as a matter of law, fraudulent.[56] In particular, he maintains that his "orders were left open in the market long enough that other traders could—and often did—trade

[55] The parties do not contest the presence of this element.

[56] Appellant's Br. 27.

against them, leading to thousands of completed transactions."[57] He accordingly concludes that his "orders were not fraudulent or 'illusory' as a matter of law."[58]

We cannot accept this argument. At bottom, Mr. Coscia "confuses *illusory* orders with an *illusion* of market movement."[59] The evidence of record supports the conclusion that Mr. Coscia designed a scheme to pump and deflate the market through the placement of large orders. His scheme was deceitful because, at the time he placed the large orders, he intended to cancel the orders. As the district court correctly noted, Mr. Coscia's argument "ignores the substantial evidence suggesting that [he] never intended to fill [his] large orders and thus sought to manipulate the market for his own financial gain."[60]

The evidence supporting the existence of a fraudulent intent is substantial. Jeremiah Park, who designed the computer program at Mr. Coscia's behest, explained that the objective of the computer program was "to pump [the] market"[61] and act "[l]ike a decoy."[62] It was intended to create the *illusion* of market movement. With Park, Mr. Coscia *designed* a system that used large orders to inflate or deflate prices, *while also*

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[57] *Id.* at 27–28.

[58] *Id.* at 28.

[59] Government's Br. 43 (emphasis in original).

[60] R.124 at 4.

[61] *See* R.86 at 235 (Tr. 502).

[62] *Id.* at 231 (Tr. 498).

structuring that system to avoid the filling of large orders. The specific parameters of Mr. Coscia's programs, which were designed to cancel orders (1) based on the passage of time (usually measured in milliseconds), (2) following the partial filling of the large orders, or (3) following the complete filling of the small orders, suggests, strongly, fraudulent intent. The programs facilitated the consummation of small orders and actively avoided the completion of large orders.[63] That 0.08% of his large Chicago Mercantile Exchange orders were filled does not make his scheme to shift artificially the market any less fraudulent.[64]

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[63] R.87 at 72 (Tr. 578).

[64] *See* R.86 at 127 (Tr. 394). Mr. Coscia additionally invites our attention to *United States v. Radley*, 659 F. Supp. 2d 803 (S.D. Tex. 2009), and *CP Stone Fort Holdings, LLC v. Doe(s)*, No. 16 C 4991, 2016 WL 5934096 (N.D. Ill. Oct. 11, 2016). Both are inapposite.

Radley involved a prosecution under 7 U.S.C. § 13(a)(2), which prohibits price manipulation and cornering of commodities in interstate commerce. In that case, the defendants were charged with conspiring to manipulate the price of TET propane by misleading "the market about the true supply of … TET propane." 659 F. Supp. 2d at 807. Ultimately, the court held that "even if [the bids] were higher than any others, [they] were actually bids, and when they were accepted, defendants actually went through with the transactions." *Id.* at 815. Accordingly, "[s]ince defendants were willing and able to follow through on all of the bids, they were not misleading." *Id. CP Stone Fort Holdings, LLC* similarly rejected a theory that the defendants' orders could have "creat[ed] the false appearance of … a change in the supply and demand for the securities[]" in light of the fact that "all of the offers or bids were legitimate and could have been matched at any time by a willing participant placing an aggressive order." *CP Stone Fort Holdings, LLC*, 2016 WL 5934096, at *6.

The evidence contrasting Mr. Coscia's trading patterns and those of legitimate traders was striking and also supports the jury's conclusion of fraudulent intent. For example, John Redman, the director of compliance for Intercontinental Exchange, testified that Mr. Coscia

> would place a small buy or sell order in the market, and then immediately after that, he would place a series of much larger opposite orders in the market, progressively improving price levels toward the previous order that he placed. That small initial order would trade, and then the large order would be canceled and be replaced by a small order, and the large orders in the opposite direction will have previously taken place.[65]

Neither case provides an apt analogy. Neither of these cases involved, as did this case, the development of a specific program to create the illusion of artificial market movement that included the use of large orders to inflate the price while also taking steps to avoid transactions in the large orders. Indeed, in *Radley*, the court specifically noted that the alleged facts fell "short of alleging an **artificial** price because none of these bidding tactics is anything other than legitimate forces of supply and demand." *Radley*, 659 F. Supp. 2d at 815 (emphasis in original). Similarly, *CP Stone Fort Holdings* rejected a theory of securities fraud rooted in the proposition that, "if a subset of orders was ultimately cancelled, those orders, in hindsight, must never have been intended to be executed." 2016 WL 5934096, at *6 (internal quotation marks omitted). Here, however, Mr. Coscia artificially moved the market by cancelling all but 0.08% of his large Chicago Mercantile Exchange orders. R.86 at 127 (Tr. 394).

[65] R.82 at 254 (Tr. 254).

Mr. Redman made clear that this was highly unusual,[66] specifically explaining that

> What we normally see is people placing orders of roughly the same size most of the time and, therefore, there aren't two order sizes in use with a different cancellation rate between them. There's just one order size in use and the cancellation rate is, there's just one.[67]

Similar evidence was presented regarding Mr. Coscia's trading on the Chicago Mercantile Exchange, where 35.61% of his small orders were filled, whereas only 0.08% of his large orders were filled. In other words, Mr. Coscia's trading patterns clearly indicated a desire to use the large orders as a means of shifting the market equilibrium toward his desired price, while avoiding the actual completion of those large transactions.

2.

Mr. Coscia also submits that the district court applied an incorrect standard of materiality when it instructed the jury that the alleged wrongdoing had to be "capable of influencing the decision of the person to whom it is addressed."[68] In his

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[66] R.86 at 85 (Tr. 352) ("Mr. Coscia was the only person we looked at in this time frame who would put in small orders with one cancellation rate and big orders with a completely different cancellation rate. That was unusual.").

[67] *Id.* at 25 (Tr. 292).

[68] R.92 at 177 (Tr. 1590).

view, the district court should have told the jury that the alleged scheme had to be "reasonably calculated to deceive persons of ordinary prudence" and that "there is a substantial likelihood that a reasonable investor [or trader] would consider [the deceptive conduct] important in making a decision."[69]

We review challenges to jury instructions de novo. *United States v. Marr*, 760 F.3d 733, 743 (7th Cir. 2014). Nevertheless, "[t]he district court is afforded substantial discretion with respect to the precise wording of instructions so long as the final result, read as a whole, completely and correctly states the law." *Id.* (internal quotation marks omitted). "We reverse only if the instructions as a whole do not correctly inform the jury of the applicable law and the jury is misled." *Id.*

Our circuit does not have a specific pattern jury instruction for commodities fraud. The district court therefore adopted the jury instruction in our pattern jury instructions for mail, wire, and carrier fraud.[70] This was an entirely reasonable decision. District courts often must craft instructions

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[69] Appellant's Br. 30 (alterations in original) (internal quotation marks omitted).

[70] R.124 at 9–10. The instructions at trial read, in relevant part, as follows:

> Counts One through Six of the indictment charge Mr. Coscia with commodities fraud.
>
> In order for you to find Mr. Coscia guilty of this charge, the government must prove each of the four following elements beyond a reasonable doubt:
>
> 1. there was a scheme to defraud any person as charged in the indictment; and

for areas of law for which there is no pattern jury instruction. In such situations, borrowing from the jury instructions governing analogous areas of law is entirely appropriate. *See Chicago Coll. of Osteopathic Med. v. George A. Fuller Co.*, 719 F.2d 1335, 1345 (7th Cir. 1983) (approving a jury instruction for the standard of care owed by *architects* based on the pattern jury instructions outlining the standard of care owed by *physicians*). Because section 1348 was modeled on the federal mail and wire fraud statutes, the district court certainly was on solid ground in looking to the pattern jury instruction for those offenses. *See United States v. Wey*, No. 15-CR-611 (AJN), 2017 WL 237651, at *9 n.6 (S.D.N.Y. Jan. 18, 2017) ("Several courts have recognized that 'because the text and legislative history of 18 U.S.C. § 1348 clearly establish that it was mod-

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> 2. Mr. Coscia knowingly executed the scheme; and
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> 3. Mr. Coscia acted with the intent to defraud; and
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> 4. the scheme was in connection with any commodity for future delivery.
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> ….
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> A scheme to defraud any person means a plan or course of action intended to deceive or cheat another. A scheme to defraud need not involve any false statement or misrepresentation of fact. *A scheme to defraud must be material, which means it is capable of influencing the decision of the person to whom it is addressed*.

R.85 at 20–21 (emphasis added); *see also* R.92 at 169–70 (Tr. 1582–83).

eled on the mail and wire fraud statutes,' an analysis of Section 1348 'should be guided by the caselaw construing those statutes.'").[71]

Moreover, Mr. Coscia's conduct certainly was material even under his own formulation of materiality.[72] The evidence at trial showed that his course of action was not only "reasonably calculated to deceive" but also that actual investors *did* find his actions "important in making a decision." Jeremiah Park clearly related that Mr. Coscia had expressed a desire to "pump" the market, and thus deceive market participants by creating illusory depth, satisfying the first of his new definitions. Moreover, market participants testified that

[71] *See also United States v. Motz*, 652 F. Supp. 2d 284, 296 (E.D.N.Y. 2009) (explaining that "the text and legislative history of 18 U.S.C. § 1348 clearly establish that it was modeled on the mail and wire fraud statutes, [and that] the Court's analysis should be guided by the caselaw construing those statutes") (internal quotations omitted); *United States v. Mahaffy*, No. 05-CR-613, 2006 WL 2224518, at *11 (E.D.N.Y. Aug. 2, 2006) (explaining that "the text and legislative history of 18 U.S.C. § 1348 clearly establish that it was modeled on the mail and wire fraud statutes").

[72] We are unpersuaded by the Government's contention that this line of argument is waived. Although Mr. Coscia initially proposed a jury instruction similar to that adopted by the district judge, R.59 at 4–6, he preserved his objection by later seeking to amend that instruction, R.74. *Cf. Wilson v. Kelkhoff*, 86 F.3d 1438, 1442 (7th Cir. 1996) ("A party waives an argument on appeal if that argument related to a jury instruction and he failed to object to the relevant jury instruction below."); *United States v. DiSantis*, 565 F.3d 354, 361 (7th Cir. 2009) ("The 'touchstone' of the waiver inquiry is 'whether and to what extent the defendant ha[s] actually approved of the jury instructions assigned as error on appeal.'") (alteration in original).

(1) large orders induced firms to fill small orders,[73] (2) algorithms were tricked by large orders, creating the illusion of an oversaturated market,[74] and (3) Mr. Coscia's actions even induced certain traders to leave the market altogether.[75] In sum, Mr. Coscia's actions were material regardless of whether we apply his standard or the district court's.

In this respect, Mr. Coscia's invocation of *United States v. Finnerty*, 474 F. Supp. 2d 530 (S.D.N.Y. 2007), *aff'd*, 553 F.3d 143 (2d Cir. 2008), and *Sullivan & Long, Inc. v. Scattered Corp.*, 47 F.3d 857 (7th Cir. 1995), is unpersuasive. Mr. Coscia believes that "the core principle arising from these decisions" is that "there can be no fraud where the underlying conduct is not contrary to reasonable expectations."[76] Although a trader may not have expected any given trade to remain on the market for any particular period of time,[77] no trader expected a

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[73] R.88 at 31 (Tr. 636).

[74] *Id.* at 44–50 (Tr. 649–55).

[75] *Id.* at 59 (Tr. 664), at 105 (Tr. 710), at 137 (Tr. 742).

[76] Reply Br. 13.

[77] The cases more readily stand for the unremarkable rule that fraud requires deception. *See United States v. Finnerty*, 474 F. Supp. 2d 530, 542 (S.D.N.Y. 2007) (holding that the Government "failed to show that interpositioning constituted a deceptive act within the meaning of the federal securities laws because it did not provide proof of customer expectations"); *Sullivan & Long, Inc. v. Scattered Corp.*, 47 F.3d 857, 864 (7th Cir. 1995) (explaining that "there was no deception").

complex, concerted effort not only to pump the market but also to create a totally non-existent market.[78]

Mr. Coscia's arguments related to "fill-or-kill orders" and "iceberg orders" are also unpersuasive. Fill-or-kill orders, "which are programmed to cancel if not filled immediately,"[79] and iceberg orders, which "are designed to obscure the true extent of supply or demand that lurks beneath the order book,"[80] are both different from the instant conduct because they are designed to be executed under certain conditions, whereas Mr. Coscia's large orders were designed to *evade* execution.

D.

We address now Mr. Coscia's argument that the district court erred in applying a fourteen-point loss enhancement. "We review a district court's interpretation and application of the guidelines de novo and its findings of fact for clear error." *United States v. White*, 737 F.3d 1121, 1139 (7th Cir. 2013).

Mr. Coscia urges that the district court erroneously employed his gain as a measure of loss in determining his sentence. It is clear that the defendant's gain may be substituted for loss if there were losses that cannot reasonably be calcu-

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[78] *See, e.g.*, R.88 at 50 (Tr. 655) (explaining the import of actual supply and demand in accurately pricing commodities).

[79] Appellant's Br. 6.

[80] *Id.* at 8. Iceberg orders accomplish their goal of obscuring supply and demand by segmenting large orders into smaller orders. Michael Durbin, *All About High-Frequency Trading* 54–55 (2010).

lated. *See* U.S.S.G. § 2B1.1 cmt. n. 3(B); *cf. United States v. Andersen*, 45 F.3d 217, 221 (7th Cir. 1995) ("Generally the defendant's gain may provide a reasonable approximation of a victim's loss, and may be used when more precise means of measuring loss are unavailable. The Application Notes … specifically allow the defendants' gain to be used as a basis for calculating an approximate loss when evidence of the exact amount of loss is not available.") (interpreting predecessor guideline, § 2F1.1). Nonetheless, we will not substitute gain as a proxy for loss where there is "no means of determining whether [the defendant's] gain is a reasonable estimate of [the victim's] loss." *United States v. Vitek Supply Corp.*, 144 F.3d 476, 490 (7th Cir. 1998) (interpreting predecessor guideline, § 2F1.1).

After reviewing the record, we are satisfied that the district court did not err in applying the loss enhancement. The nature of Mr. Coscia's trading made determining the when, where, and with whom of his transactions almost impossible; using his programs, he executed thousands of trades over a ten-week period with innumerable counterparties. In such situations, where the loss is not easily ascertainable, we have held that "probable loss" "is 'loss' within the meaning of the guideline." *United States v. Vrdolyak*, 593 F.3d 676, 681 (7th Cir. 2010) (emphasis removed).

Applying this rule, the testimony presented at trial supports a finding of probable loss. Some particular losses were documented and before the court. Twells testified that he lost $480 on trades with Mr. Coscia;[81] Dermenchyan stated that he

[81] R.88 at 30 (Tr. 635).

"lost $10,000 over the course of an hour;"[82] Gerko stated that "we probably lost low hundreds of thousands of dollars."[83] Applying our deferential standard of review, we find that the district court did not err in finding loss.

The district court also was correct in concluding that *all* losses could not be calculated reasonably. Mr. Coscia's scheme was complex, involving thousands of anonymous trades executed across multiple exchanges with numerous counterparties. Consequently, the hours of labor required to collect, collate, and analyze the relevant trading logs would have imposed an insurmountable logistical burden on the prosecution. This case exemplifies the type of logistical burdens the gain-for-loss approach was designed to alleviate. The district court therefore did not err in concluding that substituting gain for loss was reasonable. Mr. Coscia made money by artificially inflating and deflating prices. Every time he did so, he inflicted a loss.[84]

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[82] *Id.* at 51 (Tr. 656).

[83] *Id.* at 105 (Tr. 710).

[84] We recognize that these traders did not *independently* testify as to the identity of the counterparty in each of their losing transactions or the identity of the spoofer; indeed, the anonymous nature of commodities trading would have prevented them from reasonably doing so. Nonetheless, there was substantial support establishing a connection between Mr. Coscia's trades and the losses suffered by other market participants.

First, the parties stipulated to the user identities employed by Mr. Coscia and the traders who worked for him. *See* R.86 at 88 (Tr. 355). These user identities were then used to collect relevant trading data and create summary charts. *See, e.g.*, *id.* at 114 (Tr. 381) ("This chart represents

Mr. Coscia disagrees. In his view, the district court "fundamentally misapphrend[ed] the nature of futures markets" and unrealistically viewed the commodities market as "'zero sum.'"[85] He proceeds along this line of argument in three parts. First, he notes that the ultimate gain or loss enjoyed by a trader can be evaluated only after that commodity has been both purchased and sold. He then highlights that participants in futures markets established hedge positions and that "parties submit their orders not to individual counterparties but to the entire market simultaneously."[86] Ultimately, he contends that "the District Court's decision to apply a 14-point loss enhancement at sentencing was predicated on erroneous

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various summary statistics surrounding a large order entry fill and cancellations engaged by various Panther Tag 50s."); *see also* R.86 at 91–92 (Tr. 358–59), R.89 at 19–69 (Tr. 776–826). The summary charts, associated data, and derivative charts were in turn used to establish Mr. Coscia's use of large orders to shift the market and, thus, the losses suffered by the other market participants. *See, e.g.*, R.88 at 28–29 (Tr. 633–34) (testimony of Mr. Twells); *id*. at 102–06 (Tr. 707–11) (testimony of Mr. Gerko).

At bottom, the Government identified Mr. Coscia's user identities, and collected trading records related to those user identities, which showed the use of large orders to shift the market. The counterparties (i.e., the victims) then confirmed, based on their own records and recollections, that they had been involved in those trades and suffered a loss. Nothing else was required because any trade executed in Mr. Coscia's artificial market involved a transaction at a skewed price—i.e., any party trading on the opposite side of the market from his small orders necessarily lost money even though it was impossible to say with any accuracy how much money.

[85] Appellant's Br. 52.

[86] *Id*. at 53.

findings concerning the reasonableness of using Coscia's alleged US $1.4 million gain as a proxy for losses and the proof of loss adduced at trial."[87]

We do not think that Mr. Coscia's arguments rebut adequately the proposition that, in the environment of high speed trading, gain is a reasonable proxy for loss. Although a single trade cannot be viewed in isolation, the fact remains that a loss resulting from a trade with Mr. Coscia could not be purged entirely by a profit on any subsequent sale, even where the latter sale resulted in a net profit. That profit necessarily would be *less* than the proceeds earned in a series of transactions absent Mr. Coscia's artificial prices.

We also believe that Mr. Coscia's contention that gains or losses must be evaluated in relation to hedge positions in cash markets does not survive scrutiny. In particular, it seems to suggest that a loss in the futures markets may not actually be a loss due to positions in cash markets designed to set off any such financial hardship. This theory essentially would absolve Mr. Coscia from the damage he inflicted on the market and on those with whom he traded simply because at least some victims had taken steps to insure themselves and their clients. The fact remains that Mr. Coscia's illegal actions caused damage. His victims' prudence in attempting to mitigate such a loss does not require that the law ignore the initial damage caused by his actions.

Nor does it make a difference that orders initially were made to the market as a whole. The reality remains that his

[87] *Id.* at 51.

trades injured those who traded with him; these parties were always harmed by the artificial shift in market price.

Finally, we note that Mr. Coscia's conduct caused the losses incurred; without his spoofing the price of the affected commodities would not have risen or fallen, and his counterparties would not have overpaid or received less than the price their commodity would otherwise have been worth. In the end, due to the complexity and nature of the crime, gain was a reasonable substitute for loss.

Conclusion

Mr. Coscia engaged in ten weeks of trading during which he placed orders with the clear intent to cancel those orders prior to execution. As a result, Mr. Coscia violated the plain wording of the Dodd-Frank Act's anti-spoofing provision. Mr. Coscia engaged in this behavior in order to inflate or deflate the price of certain commodities. His trading accordingly also constituted commodities fraud. Finally, given the nature and complexity of his criminal enterprise, the district court did not err in imposing a fourteen-point loss enhancement. For the foregoing reasons, Mr. Coscia's conviction is affirmed.

AFFIRMED