UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF ILLINOIS
EASTERN DIVISION

UNITED STATES OF AMERICA v. JAMES VORLEY and CEDRIC CHANU, Defendants.	No. 18 CR 35 Judge John J. Tharp, Jr.

UNITED STATES' SENTENCING MEMORANDUM

The defendants, James Vorley and Cedric Chanu, manipulated one of the world's most important financial markets and defrauded other market participants for years. To boost their own trading profits and minimize their losses, they flooded the gold and silver futures exchange with billions of dollars of false orders. Their intent was to deceive other traders about the existence of genuine supply and demand, and push market prices in whatever direction benefited the defendants and their employer, Deutsche Bank. Their conduct was both deliberate and persistent, repeated thousands of times over five years.

On September 25, 2020, after a two-week trial, a jury convicted the defendants of several counts each of wire fraud affecting a financial institution. The jury also acquitted the defendants on several counts, including a conspiracy charge. The evidence at trial revealed the brazenness of the defendants' criminal scheme in the way they discussed manipulating the public commodities markets, never believing they would be apprehended and held to account. The evidence also illustrated the

sophistication of their scheme in coordinating illicit trading between conspirators on different continents and exploiting their counterparties' automated trading systems. As the United States' trial evidence and post-trial submissions have highlighted, the defendants' scheme undermined the public's confidence in the integrity of the financial markets, distorted market participants' view of supply and demand, and caused over one million dollars of loss to identifiable victims in the gold and silver futures markets. As such, and considering, in particular, the seriousness of the offense and the need to promote general deterrence, the United States respectfully submits that a significant term of imprisonment is both appropriate and necessary in this case. That said, because there is little apparent need for specific deterrence and to avoid unwarranted sentence disparities, the United States believes that a sentence at the lower end of the applicable Sentencing Guidelines range is sufficient.

I. Background

The defendants' criminal scheme was laid bare at trial and detailed in the United States' post-trial briefing. In particular, the United States incorporates by reference the factual summary included in its opposition to the defendants' motion under Federal Rule of Criminal Procedure 29. *See* Opp'n to Defs.' Mots. for J. of Acquittal (Doc. No. 363).

In addition, although the jury acquitted on the conspiracy charge and some of the substantive counts of wire fraud affecting a financial institution, the United States respectfully submits that all of the relevant conduct was proved at trial by a preponderance of the evidence, and thus even the conduct of which the defendants

were acquitted should inform the Court's sentencing decision. *See United States v. Shamah*, 624 F.3d 449, 459–60 (7th Cir. 2010) ("A sentencing court may consider conduct of which a defendant has been acquitted, as long as that conduct is proved by a preponderance of the evidence."); *see also United States v. Mesa*, No. 19-2243 (7th Cir. Dec. 23, 2020) (wire fraud case). On this and other salient points, the United States respectfully disagrees with the Presentence Report ("PSR"), which overlooks and minimizes the substantial evidence introduced by the United States during and after trial regarding the scope of the defendants' scheme and the extent of the associated losses.[1]

II. Scope of Criminal Conduct and Loss Calculation

A. Scope of Relevant Conduct

The most consequential dispute for sentencing relates to the scope of the defendants' criminal conduct and the associated loss calculation. As to the scope, the defendants' co-conspirator, David Liew, testified during trial that spoofing at Deutsche Bank was "very commonplace. It happened very often." Tr. at 744.[2] And

[1] All references herein are to Mr. Vorley's PSR. However, the recommendations in Mr. Chanu's PSR are substantially the same. Thus, the United States' arguments are applicable to both defendants.

[2] The PSR reflects the defendants' argument that "Liew's testimony demonstrates that spoofing at Deutsche bank was performed openly in the presence of supervisors and compliance officers and was not interdicted." PSR ¶ 21. That is true but hardly negates either that spoofing was widespread or that it was wrongful. As Mr. Liew explained, the fact that more senior traders—like Mr. Vorley and Mr. Chanu—were spoofing gave him confidence that he would not get in trouble, notwithstanding that the conduct was "deceptive and wrong." Tr. at 673-75. And although spoofing was commonplace at Deutsche Bank, it was difficult for compliance officers to detect, so Mr. Liew was not concerned about getting caught. *See id.* That testimony comports with the testimony of John Scheerer that "someone could violate the rules in a pretty sneaky way and CME wouldn't be able to detect it." *Id.* at 416.

the defendants' own chats confirm the frequency with which they spoofed. References to "classic" examples of spoofing, Gov't Ex. ("GX") 20, and even casual allusions to spoofing as "helping" (with no apparent need for elaboration between in-the-know co-conspirators), GX 38, show how routine the practice was for the defendants. As corroboration, the trial testimony of the United States' expert witness, Professor Kumar Venkataraman, revealed a consistent pattern of unlawful trading activity spanning tens of thousands of fraudulent orders across nearly five years, *see* Tr. 1473-84; *see also* GX 75, as the Court observed in denying the defendants' post-trial motions:

> Both the defendants' trading data, itself, and Professor Venkataraman's analyses of that data established that the defendants repeatedly and successfully traded according to the same pattern—a primary iceberg on one side of the market, and a group of large, visible orders on the opposite side that were quickly cancelled once the iceberg was filled—throughout the charged period. From August 2009 through July 2013, Vorley placed 1,616 groups of ten-lot orders opposite iceberg orders, and Chanu placed 1,191 groups of ten-lot order opposite icebergs. GX 75; Tr. 1475:14-25 (Vorley, nearly 14,103 10-lot orders total); Tr. 1478:25-1480:3 (Chanu, nearly 19,000 10-lot orders total). The differences in median duration and fill ratio between the defendants' iceberg and opposite-side visible orders were stark: Vorley's icebergs had a 60% fill ratio and median duration of 51.78 seconds, versus a 1.8% fill ratio and median duration of 1.29 seconds for the groups of 10-lot visible orders; Chanu's icebergs had a 57.9% fill ratio and median duration of 74.68 seconds, versus a 0.4% fill ratio and median duration of 2.99 seconds for his groups of 10-lot orders. GX 75.

United States v. Vorley, No. 18 CR 00035, 2021 WL 1057903, at *10 (N.D. Ill. Mar. 18, 2021); *see also id.* at *12 ("The jurors could . . . infer intent to defraud from the defendants' reliance on an otherwise economically unsound trading strategy for

roughly five years across thousands of trades.").

Against this backdrop, the United States respectfully submits that the Court should adopt Professor Venkataraman's post-trial analysis regarding the scope of relevant conduct. *See* Ex. A. Consistent with his trial testimony, Professor Venkataraman's post-trial analysis "identified approximately 5,900 Spoofing Sequences, comprising over 42,000 individual Spoof Orders [as defined in Professor Venkataraman's declaration] whose aggregate notional value at placement equals approximately $74.5 billion." *Id.* at 6.[3] Within this vast universe of illicit activity, Mr. Vorley had the greater number of solo spoofing episodes (2,914 as compared to Mr. Chanu's 2,239), whereas Mr. Chanu had considerably more individual spoof orders (19,850, as compared to 15,131 for Mr. Vorley).[4] But both individually and collectively, the defendants knowingly and intentionally engaged in thousands of separate criminal acts.

The defendants' arguments to the contrary, as reflected in the PSR, fall short. *First*, the defendants contend that the United States' relevant conduct analysis "clashes with the jury's verdict," PSR ¶ 27, because the jury acquitted on certain counts that "involved the government's purported signature of 'spoofing' – *i.e.*, quickly

[3] A small percentage—280 episodes, comprising 3,449 Spoof Orders—involved solo spoofing by Mr. Liew. The remainder of these episodes involved either solo spoofing by Mr. Vorley or Mr. Chanu, or coordinated spoofing involving one or both of the defendants.

[4] As described in Professor Venkataraman's declaration, the United States instructed him to exclude certain types of spoofing episodes for purposes of his post-trial analysis, and to include in his analysis both (1) single, large spoof orders, and (2) layered, or grouped, 10-contract spoof orders, whereas his trial testimony focused on the latter. *See, e.g.*, GX 75. That is why the numbers reflected in his declaration differ somewhat from his trial testimony.

cancelled large visible orders placed opposite iceberg orders," *id.* ¶ 28. But this argument fails to account for the different standards of proof applicable at trial and at sentencing: that the jury was not unanimously convinced beyond a reasonable doubt that certain trading sequences were fraudulent says nothing about whether the United States has proven the defendants' relevant conduct by a preponderance of the evidence, which it emphatically has. *See Vorley*, 2021 WL 1057903, at *27 (referring to the "convincing evidence of the defendants' guilt," including "Professor Venkataraman's analysis of the defendants' trading during the charged episodes and across several years of trading").

Second, the defendants make far too much of the United States' pre-trial statement that its initial episode identification criteria were "both under- and over-inclusive." PSR ¶ 29. The United States did not rely on those criteria at trial. Nor did Professor Venkataraman employ them in his post-trial analysis. In short, the prosecution team's view of criteria that were never at issue in this case has no bearing on the use of *different* criteria to define the scope of relevant conduct.

Third, the defendants' rehash their argument—already rejected by the jury and the Court—that their visible orders looked the same whether or not they had icebergs on the opposite-side of the market. *See id.* ¶¶ 31-32. As the Court has explained, this argument misses the mark:

> It mischaracterizes the scheme by ignoring the probative import of the iceberg orders, which as alleged and argued by the government, were an integral part of the scheme. The government's theory was not that all large visible orders were fraudulent; it was that the defendants' scheme

> involved the placement of large visible orders on the opposite side of the market from open iceberg orders that were priced above (for offers) or below (for bids) the prevailing market price. There was ample evidence from which the jury could conclude that transactions that fit that pattern were part of a scheme to defraud rather than the product of 'coincidence.' That the defendants frequently placed and canceled visible orders when they did not have open iceberg orders pending on the opposite side of the market says nothing about their intent when placing and canceling such orders while trying to fill open iceberg orders at better prices than the market was offering

Vorley, 2021 WL 1057903, at *16. To be clear, the United States' relevant conduct analysis does not include large or grouped visible orders without an opposite-side iceberg, but there *is* ample evidence that these orders were not intended to trade. The defendants have pointed out that these orders were placed and canceled rapidly and exhibited extraordinarily low fill ratios, and as Professor Venkataraman has noted, a "persistent strategy of sending in an order and cancelling it immediately upon submission is just not economically rational" or "consistent with the strategy where the trader is trying to get the orders filled." Tr. 1406. Moreover, one of the trading sequences included in Professor Venkataraman's declaration, *see* Ex. A at 26, supports the conclusion that the defendants sometimes placed spoof orders to test the market's reaction and, if the market responded, they placed an iceberg order on the opposite side.

Fourth, relying on *United States v. Chube II*, 538 F.3d 693 (7th Cir. 2008), the defendants assert that the United States must present particularized evidence as to each sequence it proposed to include in the relevant conduct. *See* PSR ¶ 34. But the defect in *Chube* was that the district court's relevant conduct determination was

based on evidence that lacked precision. *See* 538 F.3d at 704 ("[S]tating that '[n]umerous files' contained evidence suggesting illicit prescribing is not sufficient to sweep every pill in all 98 files into the relevant conduct calculation."). That issue is not present here. The parameters of the United States' relevant conduct analysis are well-defined, precise, supported by the trial evidence, and consistent with industry standards. *See CFTC v. Oystacher*, No. 15-CV-9196, 2016 WL 3693429, at *20 (N.D. Ill. July 12, 2016) (describing findings of NYMEX and COMEX Panels: "In determining that the non-iceberg orders were entered without the requisite intent to be traded, the Panel considered numerous factors, including the significant imbalance created by [the defendant's] 50-lot non-iceberg orders, the percentage of large orders cancelled, and the exposure time of the cancelled orders."); *see also United States v. Coscia*, 866 F.3d 782, 796 (7th Cir. 2017) (citing the relative durations and fill ratios of the defendant's "large" and "small" orders as evidence that the large orders were spoofs).

In sum, the United States has met its burden of proving relevant conduct by a preponderance of the evidence, and the defendants have failed entirely to rebut that evidence. As such, there is more than a sufficient basis for the Court to adopt Professor Venkataraman's submission as to the scope of the relevant conduct.

B. Loss Calculation

Having defined the extent of the defendants' criminal conduct, Professor Venkataraman set out to "calculate the amount of loss suffered by other market participants as a result of the Defendants' spoofing activity." Ex. A at 3. The foundation of Professor Venkataraman's approach is consistent with the Seventh Circuit's observation in *Coscia* that "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." 866 F.3d at 801 & n.84. But whereas the United States took the position in *Coscia* that loss was not reasonably calculable, *see id.* at 801 ("the hours of labor required to collect, collate, and analyze the relevant trading logs would have imposed an insurmountable logistical burden on the prosecution"), the United States *did* devote the necessary resources to calculating loss with precision in this case.

To do that, Professor Venkataraman first identified all market transactions that occurred while the defendants' spoof orders were active. *See* Ex. A at 10. His objective was "to identify losses incurred by market participants who bought while the Defendants' Spoof Orders to buy were active (which increased the perception of buying interest) and participants who sold while Defendants' Spoof Orders to sell were active (which increased the perception of selling interest)." *Id.* To calculate these losses, Professor Venkataraman compared the prices at which other market participants *actually* traded while the defendants' spoof orders were in the market, to the prices "at which they would have been able to trade in the absence of the

Defendants' Spoof Orders," which Professor Venkataraman calls the "But-For Trade Prices." *Id.* at 11. As he explains in his declaration, "[t]he best available indicators of But-For Trade Prices are the last observed bid and ask prices immediately before the placement of the first Spoof Order in each Spoofing Sequence. The But-For Trade Price is therefore the last observed best bid price for buy-side Spoof Orders and the last observed best ask price for sell-side Spoof Orders." *Id.*

Professor Venkataraman's methodology thus allowed him to measure the concrete effects of the defendants' unlawful activity:

> For each transaction that occurred while a Spoof Order was active, I calculate the difference between the price at which the execution actually occurred ("Actual Trade Price") and the corresponding But-For Trade Price. This price difference is a measure of the additional mark-up, or the higher cost (or potentially, benefit) of trading for market participants on the Spoof Order side of the transaction while the Spoof Orders were active. Specifically, when the Actual Trade Price is "worse" (*i.e.*, higher for buyers and lower for sellers) than the But-For Trade Price, the participants incurred a higher cost relative to the state of the market before the Spoof Order was placed. Conversely, when the Actual Trade Price is "better" (*i.e.*, lower for buyers and higher for sellers) than the But-For Trade Price, the participants recognized a benefit. To arrive at the "Unadjusted Market Loss" associated with an individual transaction, I multiply the price differential by the transacted quantity. I aggregate this measure across all transactions executed by market participants while Spoof Orders are active to arrive at a total Unadjusted Market Loss estimate across all Spoofing Sequences.

Id. at 12. Applying this methodology, Professor Venkataraman concluded that "the total Unadjusted Market Loss for market participants on the Spoof Order side based on all transactions observed while the Spoof Orders are active is over $1.4 million. These market participants include 3,741 unique traders trading through 322 unique

firms." *Id.* at 14.

From there, and to gain additional confidence in his results and account for the potential impact of external factors, Professor Venkataraman modeled two approaches to "account for the fact that some participants may have been willing to increase/decrease their order's limit price or cross the bid-ask spread to trade at a worse price even in the absence of Spoof Orders." *Id.* at 15. In brief, the first approach compares "the observed cost of trading while the Defendants' Spoof Orders were active to the observed 'but-for' cost of trading during a period of equal length immediately before the spoof orders were placed." *Id.* at 4; *see also id.* at 16. This approach provides an "estimate of the 'normal' cost of trading of market participants around the time of a Spoofing Sequence, absent the placement of the Spoof Orders," and Professor Venkataraman consequently "discount[s] the total Unadjusted Market Loss of the Spoofing Sequences by deducting the total But-For cost of trading during the control period to obtain an Adjusted Market Loss estimate." *Id.* at 16. This approach results in a total "Adjusted Market Loss" of $1,205,588. *Id.* at 20.

The second approach compares "the rate at which market participants on the same side as the Defendants' spoof orders crossed the bid-ask spread while the Spoof Orders were active to the rate immediately before the spoof orders were placed. The change in the rate of spread-crossing indicates the impact of the spoofing pressure on the trading activities of other market participants." *Id.* at 4; *see also id.* at 20-21. As

Professor Venkataraman explains in his declaration:

> Market participants incur trading costs primarily when they cross the bid-ask spread to trade. For example, a market participant who intends to buy gold futures contracts could place a resting limit order at the best bid. By crossing the spread to trade at the best ask, which is at a higher price, this market participant incurs a cost. As explained earlier, spoofing, and the misleading appearance of supply/demand it introduces, can induce market participants to cross the spread and incur the associated costs.

Id. at 20. To measure the impact of the defendants' Spoof Orders using this approach, Professor Venkataraman "calculate[d] the spread crossing rate for the five seconds immediately preceding the placement of the Spoof Orders and for the duration of the Spoof Orders across all Spoofing Sequences," and concluded that, "compared to the five seconds before the placement of the Spoof Orders, the rate of spread-crossing for orders on the Spoof Order side sharply increases in the first five seconds after the Spoof Orders are placed and remains elevated for the duration of the Spoof Orders," *id.* at 21, which he attributes to the defendants' placement of the spoof orders, *see id.* at 22. By discounting the Unadjusted Market Loss to account for the "normal rate of spread crossing" absent the spoof orders, Professor Venkataraman "arrive[s] at a measure of the Alternative Adjusted Market Loss," *id.*, which he calculates as $1,135,974, *id.* at 23.

As summarized in the table below, both approaches produce similar results, with total actual losses to identifiable market participants of approximately $1.1 million to $1.2 million:

Spoofing Sequence Category	Unadjusted Market Loss	Adjusted Market Loss (with But-For Cost of Trading)	Alternative Adjusted Market Loss
Vorley Solo	$685,880	$586,401	$540,543
Chanu Solo	$503,920	$382,260	$397,140
Vorley/Chanu	$203,350	$198,899	$160,261
Liew	$48,255	$38,028	$38,030
Total	**$1,441,405**	**$1,205,588**	**$1,135,974**

The United States respectfully submits that this calculation provides the Court, at a minimum, with a "reasonable estimate of the loss." U.S.S.G. § 2B1.1 cmt. n.3(c); *see also United States v. Natour*, 700 F.3d 962, 976 (7th Cir. 2012) ("The district court's loss calculation . . . need only be a reasonable estimate of the loss." (quotation marks omitted)). Professor Venkataraman's episode identification methodology is fully consistent with the trial evidence, and his loss calculation is amply documented, grounded in methodology that is common in the field of economics, *see* Ex. A at 15, comports with the Seventh Circuit's view of market loss in *Coscia*, *see* 866 F.3d at 801 & n.84, and logically accounts for external factors and variables that could impact the results. If anything, Professor Venkataraman's approach is conservative and, as he explains, "likely understate[s] market harm for several reasons." *Id.* at 24. For instance, he only calculated losses to other market participants while the defendants' spoof orders were active in the market and "did not attempt to capture the potential lingering effect of the Spoof Orders after they are canceled, when market participants may still be responding to the pressure created by the Spoof Orders." *Id.* at 24-25.

Professor Venkataraman also was instructed to exclude from his analysis potential spoof orders that did not have a concurrent order on the opposite side of the market, *see id.* at 25-26, as well as instances of coordinated spoofing between the defendants and other traders, *see id.* at 25.

The defendants' efforts to poke holes in Professor Venkataraman's analysis are unpersuasive. They rely on an affidavit submitted by Dr. Daphne Chen, *see* Ex. B, but Dr. Chen's criticisms of Professor Venkataraman's work ring hollow. *First*, Dr. Chen takes issue with Professor Venkataraman's episode identification methodology, because his approach to defining spoofing episodes "does not require an execution on the opposite-side iceberg order," and because "it does not impose any time limitation on the alleged spoof order." *Id.* at ¶ 3. But logically, whether the defendants' spoof orders were successful in helping to fill their opposite-side icebergs (*i.e.*, whether the defendants benefitted) has no connection to whether other market participants suffered harm; a spoof order can affect market prices even if it does not move them far enough to benefit the spoofer. Many of the episodes presented at trial prove the point. For instance, in the January 28, 2009 episode, Edward Bases entered dozens of spoof orders on the buy side of the market before he pushed up the market far enough that Mr. Chanu was able to start filling his sell order. *See* GX 1 at 13. And Dr. Chen's concern about spoof order durations fails to acknowledge that the identified spoofing episodes are typically short, *see* Ex. A at 7-9,[5] or that even

[5] Seemingly without appreciating the impact on this argument, Dr. Chen actually concedes elsewhere in her affidavit that "a majority of the alleged spoof periods last less than five seconds." Ex.

imposing time limitations does not materially change the ultimate loss calculation, *see id.* at 15, 20.

Second, Dr. Chen challenges the Unadjusted Market Loss because she sees "no basis for th[e] assumption" that, in the absence of the defendants' spoof orders, the "alleged victims . . . would have executed trades for the same quantities at the 'But For Trade Prices' . . . . Rather, the alleged victims might have traded at the same price, a worse price, or a better price, or they may not have traded at all absent the alleged spoof order." Ex. B. at ¶ 14. But Dr. Chen appears to misunderstand the nature of Professor Venkataraman's analysis: the Unadjusted Market Loss is his *starting* point; her criticism is precisely what Professor Venkataraman's two adjustment methodologies account for.

Third, Dr. Chen claims that "Professor Venkataraman does not account for the fact that the alleged victims or other market participants may also have benefitted from the purported price impact of the alleged spoofs." *Id.* at ¶ 15. That is true but irrelevant. As a legal matter, losses to one party are not offset by gains to another party, *see, e.g.*, U.S.S.G. § 2B1.1 cmt. n.3(F)(iv), and Dr. Chen provides no economic rationale that would support a contrary result here.

Fourth, Dr. Chen asserts that a "standard way to measure trading gains and losses (supported by academic literature) is to compare the price at which a trade is executed to an estimate of the underlying security value." Ex. B. at ¶ 16. That may

B at ¶ 22.

be true, but the law is clear that, "[i]n a case involving the fraudulent inflation or deflation in the value of a publicly traded security or commodity, the court in determining loss may use any method that is appropriate and practicable under the circumstances," U.S.S.G. § 2B1.1 cmt. n.3(F)(ix), and Dr. Chen offers no cogent reason why the methodology selected here is inappropriate. Indeed, the Sentencing Guidelines endorse an approach similar to the one Professor Venkataraman utilized here—*i.e.*, using a control period to measure the impact of fraudulent manipulation on a publicly-traded commodity's price. *See id.*[6] And indeed, although Dr. Chen disputes Professor Venkataraman's use of the term "event study," Ex. B at ¶ 23, her substantive criticism of his methodology is nonsensical: "Presumably, one could look at how prices changed after placement of a spoof order and attempt to control for other factors that may have affected the price, but that is not what Professor Venkataraman did. He was trying to calculate losses by comparing transactions during an alleged spoof period with transactions during a control period." *Id.* What she suggests *ought* to be done and what she says Professor Venkataraman *has* done are the same.

Fifth, Dr. Chen challenges two aspects of Professor Venkataraman's adjustment approach. She claims, "by construction," the presence of a spoof order in the market "effectively means that all transactions during the period when the order

[6] The method described in the Guidelines contemplates a 90-day control period, not one measured in seconds. But the split-second nature of spoofing, combined with the futures exchange market dynamics, makes a far shorter time period appropriate here.

is resting on the market will be at inferior prices." *Id.* at ¶19. This assertion is incorrect. After a spoof order enters the market, other market participants could continue to trade at the But-For Price so long as it remains the prevailing price or at a better price if the market moved in their favor, just like during the control period. In fact, Professor Venkataraman identified instances in which the "market loss calculation is negative," meaning that market participants were able to execute at better prices while the defendants' spoof orders were active. Ex. A at 14 n.28. Dr. Chen also contends that "Professor Venkataraman does not control for differences in quantity," Ex. B at ¶ 20, by which she means there can be more trading in the spoof period than in the control period, such that the total cost of trading in the former will be overstated relative to the latter. But controlling for any difference in quantity is fundamentally misguided because this difference is what accurately captures the mechanism through which spoofing leads to market losses, *i.e.*, it spurs traders to transact at worse prices more frequently. The fact that there is more trading during spoof periods is itself evidence of the market impact of spoofing.

Sixth, Dr. Chen also questions Professor Venkataraman's alternative adjustment approach. Specifically, she claims that Professor Venkataraman "only adjusts for the normal rate of spread crossing" and not for the normal rate of passive "transactions that would have occurred at the best bid or offer." *Id.* at ¶ 21. But if there was a passive transaction at the same best bid or offer that existed at the time a spoof order was placed, there would be no resulting loss. And if the best bid or offer

moved, any passive fills *would be* included in Professor Venkataraman's adjustment. Dr. Chen also argues that the selection of a five-second control period is arbitrary, *see id.* at ¶ 22, but Professor Venkataraman performed a sensitivity analysis and determined that his "results are not sensitive to the duration of the pre-Spoof Order period. In other words, comparing the rate of spread-crossing with one second or 10 seconds before the Spoof Order is placed yields similar results." Ex. A at 21 n.35.

Accordingly, none of Dr. Chen's criticisms undermines the reasonableness of Professor Venkataraman's loss calculation, which the United States urges the Court to adopt.[7] Given that Professor Venkataraman has modeled two approaches, yielding results between $1,135,974 and $1,205,588, *see id.* at 20, 23, and to be conservative, the United States respectfully submits that the Court should find the loss amount to be the lower of these sums, *i.e.*, $1,135,974, *see United States v. Gumila*, 879 F.3d 831, 836 (7th Cir. 2018) (approving district court's loss calculation when more conservative option of loss estimates was used). Moreover, in light of the joint and coordinated nature of the defendants' criminal conduct—whether characterized as a conspiracy or a scheme—both defendants should be liable for the entire loss amount. The trial evidence showed that the defendants coordinated their spoofing efforts, *see, e.g.*, GX 1 at 7 (Vorley spoofing to help Chanu), 49 (Chanu spoofing to help Vorley), employed strikingly similar spoofing methods, *see, e.g.*, GX 75, discussed spoofing with one

[7] Dr. Chen also disputes Professor Venkataraman's gain analysis. Her arguments come up short, but because actual loss is calculable, there is no need for the Court to rely on gain as an alternative measure of loss.

another, *see, e.g.*, GX 188, and had a shared interest in each other's profitability, *see* Tr. at 748, 754, which they furthered by spoofing, *id.* at 759. As such, the full extent of each defendant's spoofing was both reasonably foreseeable to the other defendant and in furtherance of their jointly undertaken criminal activity. *See United States v. Aslan*, 644 F.3d 526, 536–37 (7th Cir. 2011) ("With respect to the loss amount that can be attributed to a defendant, the court must determine (1) whether the acts resulting in the loss were in furtherance of jointly undertaken criminal activity; and (2) whether those acts were reasonably foreseeable to the defendant in connection with that criminal activity.").[8]

III. Sentencing Guidelines Calculation

The United States submits that both defendants are subject to the same Sentencing Guidelines calculation. The base offense level is 7. *See* U.S.S.G. § 2B1.1(a)(1). On this point, the United States agrees with the PSR. *See* PSR ¶ 60.

Consistent with the foregoing discussion, the United States respectfully disagrees with the PSR that no loss enhancement applies. *Id.* ¶ 65. As the Seventh Circuit has noted, any trade executed in an artificial market involves a transaction at a skewed price, and thus any party trading on the opposite side of the market from defendants' genuine orders necessarily lost money. *See Coscia*, 866 F.3d at 801 & n.84. Professor Venkataraman's approach provides the Court, at a minimum, with a

[8] Even if the Court were to remove losses associated with solo spoofing by Mr. Liew, the total loss amount would decrease by only $38,030 (bringing the final sum down to $1,097,944). *See* Ex. A. at 24. Nevertheless, given that the defendants taught Mr. Liew to spoof and both coordinated and discussed spoofing with him, his solo spoofing was reasonably foreseeable to them.

reasonable estimate of the resulting loss amount. As such, the United States submits that the defendants' base offense level is increased by 14, because the actual loss amount of $1,135,974 is more than $550,000 but not greater than $1,500,000. *See* U.S.S.G. § 2B1.1(b)(1)(I).

Further, two levels are added because the offense involved 10 or more victims. *Id.* § 2B1.1(b)(2)(A). On that point, the Court can rely on Professor Venkataraman's analysis that the market participants affected by the defendants' scheme "include 3,741 unique traders trading through 322 unique firms." Ex. A at 14. The United States has provided the names of ten trading firms and banks that were negatively impacted by the defendants' crimes. *See* PSR ¶ 66. Moreover, in view of the fact that the purpose of the scheme was to deceive other market participants, irrespective of who they were, and the evidence that "the scheme worked" repeatedly, *Vorley*, 2021 WL 1057903, at *7, it is permissible for the Court to "scal[e] up the evidence," rather than to conclude that *only* the two traders from Quantlab Financial ("Quantlab") and Citadel Securities ("Citadel") who testified at trial were victims of the defendants' scheme. *Gumila*, 879 F.3d at 834; *see also id.* at 834-35 ("The judge was not required to limit the loss calculation solely to those eight patients when evidence established a far more sweeping overall fraudulent scheme.").[9]

[9] In a letter to the United States Probation Office, and as reflected in the PSR, the defendants assert that the United States did not prove during trial that Quantlab or Citadel—or any other victim—actually lost money as a result of the defendants' scheme. *See* Ex. C at 1. But of course, during trial, the United States' objective with the Quantlab and Citadel witnesses during trial was to prove

Finally, the United States agrees with the PSR, *see* PSR ¶ 71, that another two levels are added because a substantial part of the scheme was committed from outside the United States, and the offense otherwise involved sophisticated means and the defendants intentionally engaged in or caused the conduct constituting sophisticated means, *see* U.S.S.G. § 2B1.1(b)(10), including by layering their spoof orders to make them appear "more genuine" or "more real," as Mr. Liew testified at trial, Tr. at 687. With a total offense level of 25 and criminal history category of I, the resulting Guidelines range is 57 to 71 months of imprisonment. The United States objects to the contrary findings and resulting Guidelines calculation in the PSR.

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materiality and deception, not actual loss. The evidence of actual loss comes from Mr. Liew's testimony that spoofing worked, the substantial corroborating evidence showing how much faster the defendants' iceberg orders were filled while they were spoofing, *see* GX 74 at 6-7, and Professor Venkataraman's post-trial loss analysis.

In the defendants' letter, they also refer to the universe of spoofing episodes that comprise the relevant conduct as "uncharged spoofing sequences." Ex. C. at 3. Obviously, the United States did not charge 5,900 separate counts, but these episodes were part of the charged scheme.

Finally, in the defendants' letter, they assert that the United States "did not introduce any evidence at trial, or even argue at trial, that the defendants' alleged spoofing episodes could possibly have impacted traders that were not using high-frequency trading algorithms." *Id.* at 5 n.2. That is not true. In fact, the evidence showed that Mr. Vorley himself was fooled by a spoofer, *see* GX 84 at 1-2, and a manual trader at another bank, Michael Chan, told Mr. Liew that he thought spoof orders placed by Mr. Chanu were real, *see* Tr. at 656-62. But in any event, there is no reason why a spoof order intended to present a distorted picture of supply and demand would not equally affect manual and algorithmic trader.

IV. A Significant Term of Imprisonment is Warranted

A. The Need for the Sentence Imposed to Reflect the Seriousness of the Offense, Promote a Respect for the Law, and Provide Just Punishment for the Offense

A significant sentence of imprisonment is necessary in this case to reflect the seriousness of the offense, to promote respect for the law violated here, and to provide just punishment. The defendants' crimes directly harmed other futures traders and caused over one million dollars in calculable loss. But of equal or greater importance, the defendants' actions also polluted the public marketplace. As this Court observed in another spoofing case, offenses that involve commodity futures manipulation have a broad and "serious" impact on financial markets, even where the impact of any one trade is small. *See United States v. Zhao*, No. 18 CR 24, Sentencing Tr. (Doc. No. 74) ("*Zhao* Sentencing Tr.") at 27. This type of offense "threatens the integrity of the financial markets because it prompts people to question the lawfulness of the conduct and the good faith of the participants that operate the financial system and perpetuate the kind of thought process that says this system is rigged. It's rigged in favor of insiders and people who know how to manipulate it. That's the kind of crime that calls -- you know, undermines confidence of the public in the integrity of the markets." *Id.* at 28. Further, because "so much of our economic welfare depends on capital markets and their efficient functioning…the economy suffers tremendously" when "people don't have confidence in the reliability of those markets." *Id.* The sentencing court in *United States v. Coscia*—the first criminal spoofing case—emphasized the same point: "well-functioning markets depend on accurate

information, and that's the information concerning supply and demand. Inaccurate information skews the market." No. 14 CR 551, Sentencing Tr. (Doc. No. 162) at 47. And the sentencing court in *United States v. Sarao*—the only other spoofing case where the defendant has been sentenced to date—also underscored that the defendant's "actions contribute to abusing the integrity of the market, which is something that is essential to maintaining a healthy economy" and observed that the defendant's spoofing "has very significant economic impact. And, therefore, it's a serious offense." No. 15 CR 75, Sentencing. Tr. (Doc. No. 121) at 35.

The evidence at trial underscored why market integrity is damaged by unlawful conduct like that of the defendants. As John Scheerer—a representative of the CME Group, Inc. ("CME")—testified, "you're talking about people . . . you're exchanging money. So this is a very real thing, so it needs to be -- you know, everyone needs to know that everyone is playing by the rules and that it's a fair environment and a fair marketplace. . . . And, you know, trading on CME, trading any product, it's not a game. You're talking about a significant amount of money and impact to the economy." Tr. at 385. Professor Kumar Venkataraman also explained that spoofing-like behavior, "in the long run hurts the integrity of the market because market participants have less confidence that the market is showing them accurate prices." *Id.* at 1403. He continued:

> They also consider the risk of being cheated in the market. So there is a reduction in trust in financial markets, and this may cause some participants to reduce their participation or even entirely withdraw from the market. And investors who withdraw from the

> market are clearly hurt by these kinds of spoofing or manipulative strategies, but even other investors are hurt indirectly because they have fewer investors to trade with, and, therefore, it affects the liquidity of the market.
>
> In other words, if false information is allowed to be presented to the market on a consistent manner, it affects the two important functions of financial markets, which is the price discovery function, where the market throws out prices that are informative for evaluation purposes, and it hurts the liquidity of the market, which is the ability for market participants to find counterparties easily and trade quickly at low cost.

Id. at 1403-04. Professor Venkataraman also emphasized the "long-term effects of spoofing activity on financial markets" in his post-trial loss analysis:

> [T]he practice of spoofing degrades market integrity by causing a loss of confidence among participants. Traders factor in the risk of being cheated by reducing participation or withdrawing from the market, which has the potential to hurt market liquidity by decreasing the pool of available counterparties with whom to trade. False information on demand and supply also lower the market participant's confidence that the observed futures prices are accurate. Thus, the practice of spoofing degrades the two primary functions of financial markets – liquidity and price discovery. In other words, the Spoofing Sequences have lasting detrimental effects far beyond the periods covered by Defendants' Spoofing Sequences.

Ex. A. at 26-27. Mr. Liew—the defendants' co-conspirator—echoed the point: "[S]poofing is bad because it just leads to market dysfunction. If everyone around spoofs, you really can't tell what is the market and how -- and you're not able to form views. And over time, you're just going to lose money and everyone is going to get hurt as a result of the spoofing." Tr. at 765. And Travis Varner—a trader at Quantlab Financial and a victim of the defendants' crimes—described the real-world consequences of spoofing, namely, if orders in the marketplace did not reflect true

supply and demand, Quantlab's trading models would cease to function efficiently and Varner would want to withdraw from the market. *Id.* at 1761-63.

Moreover, the defendants' crimes were capable of harming not only the gold and silver futures markets, but correlated markets, too. As the defendants themselves elicited through cross-examination, the gold and silver futures markets are closely tied to other financial markets, including currencies, *see id.* at 845, 1525, and securities such as precious metals-based Exchange Traded Funds ("ETFs"), *see id.* at 1693. Mr. Varner testified that the correlation can be two-way, *id.* at 1746, meaning that, if gold and silver futures prices are manipulated, there could be a corresponding artificial movement in ETF prices.

The impact of the defendants' crimes thus was serious, and their manner of executing the fraud scheme was especially brazen. In short, the defendants treated the public marketplace like their private playground. The trial evidence showed that, when they were engaged in spoofing, the defendants flashed huge orders that more than doubled the average visible market depth. *See* GX 74, 75. At certain times, the defendants' false orders dominated the market. On March 16, 2011, for instance, Mr. Vorley's spoof orders in silver comprised 74.1% of the entire order book. *See* GX 1 at 63. On May 11, 2011, Mr. Chanu's spoof orders in silver were 92.6% of the order book. *See id.* at 73. The defendants' false orders amounted to $2.6 billion in just the 61 trial focus episodes in GX 1, *see* GX 74 at 5, but the scheme embraced *tens of thousands* of spoof orders over *five years*, *see* GX 75 at 2, 4; *see also* Ex. A at 6 (42,270 orders).

Because each order fraudulently misrepresented the defendants' intent to trade, that equates to tens of thousands of individual, separate crimes.

The duration of the defendants' scheme is especially noteworthy. As the Court recognized in another multiyear spoofing case, the duration of criminal activity is an aggravating factor. *See Zhao* Sentencing Tr. at 28 ("Here there are some additional aggravating factors; most centrally the duration of this offense. You know, this wasn't Mr. Zhao making a bad decision on one or two days. This was a sustained course of conduct over a period of almost four years."). The defendants' e-communications corroborate both how accustomed they were to spoofing, *see e.g.*, GX 20 ("classic"), and how cavalier they were about their market manipulation, *see, e.g.*, GX 85 ("that does show u how easy it is to manipulate it sometimes" "yeah yeah of course").

The defendants' crimes were rooted in greed and a sense of impunity. These were not crimes born of desperation, like some economic offenses. The defendants were handsomely compensated by Deutsche Bank and, in fact, the defendants elicited during trial that the charged conspiracy period was an especially good time to trade gold and silver. *See* Tr. at 816. They cheated and defrauded other traders to make *more* money, and because they apparently believed they could get away with it. In Mr. Vorley's case, specifically, his sense of impunity persisted even when his employer questioned his trading practices in 2015, and Mr. Vorley blatantly lied in an effort to avoid consequences.

B. The Need to Afford Adequate Deterrence

The United States acknowledges that there is little need to specifically deter these defendants from committing trading crimes in the future. But it is critical that the sentence imposed by the Court serve as a general deterrent to others who may be engaged in, or considering whether to engage in, this type of offense. Market manipulation, whether through spoofing or otherwise, is difficult and costly to detect and prosecute. Would-be manipulators know this and likely consider the low prospects of apprehension in deciding whether to engage in abusive trading practices. *See United States v. Brown*, 880 F.3d 399, 405 (7th Cir. 2018), citing *United States v. Goffer*, 721 F.3d 113, 132 (2d Cir. 2013) (noting that "high sentences" were necessary to alter the calculus "that insider trading 'was a game worth playing'"); *see also United States v. Gupta*, 904 F. Supp. 2d 349, 355 (S.D.N.Y. 2012) (observing that, where a crime is hard to detect, "others similarly situated to the defendant must therefore be made to understand that when you get caught, you go to jail"). Therefore, a significant sentence for Mr. Vorley and Mr. Chanu is necessary to alter the calculus for other traders in the industry. *See United States v. Fechete*, 497 Fed. Appx. 626 (7th Cir. 2012) (affirming 262-month sentence for wire fraud, recognizing that the "type of fraud committed by Fechete was difficult to detect and difficult to prosecute, necessitating a higher sentence for general deterrence purposes").

The United States opposes, in the strongest possible terms, the PSR's recommendation of, effectively, no term of imprisonment. The CME is the world's largest financial derivatives exchange. It is a critical part of the U.S. and global

financial systems. If traders can manipulate the CME with impunity, be convicted at trial, and *still* get away scot-free, it will be open season on the U.S. financial markets, and criminal enforcement efforts will decline precipitously. These types of crimes are incredibly time- and resource-consuming for the United States to prosecute, as the Court heard at trial, *see* Tr. at 1524—not to mention the barrage of baseless character attacks to which the prosecution team was subjected in this case, *see Vorley*, 2021 WL 1057903, at *33 (observing that the defendants "can find fault with any action the government takes"). If hard-won trial convictions are not met with serious sentences, there is a real risk that market manipulation crimes will not be prosecuted. That may be good for fraudsters, but the reallocation of prosecutorial resources *away* from white collar crime cannot be a socially-desirable result.

Moreover, as a practical matter, a sentence here that does not include a substantial term of imprisonment will create a significant risk that other defendants will not accept responsibility for their conduct. As this Court has recognized previously, there is societal value to broadcasting "as part of the public message" in a criminal sentencing that "people do need to do the right thing. They do need to cooperate with law enforcement and investigations, and doing so will be rewarded. And that's an appropriate part of the message that [a] sentence has to send, along with the message that this doesn't erase the fact that serious misconduct was committed, and that requires serious consequences." *Zhao* Sentencing Tr. at 30. But if Mr. Vorley can defraud other traders for years, lie to his employer when caught,

submit a non-credible affidavit to the Court during the course of his criminal prosecution, fight tooth-and-nail every step of the way, lose at trial, and *still* receive a slap on the wrist, why would anyone ever plead guilty, much less cooperate?

The United States recognizes that the Guidelines provide that, in some cases involving "relatively small loss amounts suffered by a relatively large number of victims . . . . a downward departure may be warranted." U.S.S.G. § 2B1.1 comment, n.21(C). But nearly *every* market manipulation case involves diffuse losses. That is precisely why criminal enforcement, and meaningful sentences, are necessary. The harms are diffuse, and because financial markets tend to be anonymous, victims typically lack the information and means to pursue redress themselves. In any event, even a modest departure—or more appropriately, a sentence at the lower end of the applicable Guidelines range of 57-71 months, as the United States advocates—should result in a meaningful term of incarceration, not *no* imprisonment, as the PSR recommends. The inappropriateness of the outcome recommended by the PSR is compounded by the fact that, absent a period of imprisonment, the defendants will effectively suffer no consequences other than reputational harm and disruptions to their lives that are not at all inappropriate for people who have been convicted of serious crimes. Their restitution obligations have been resolved by Deutsche Bank's deferred prosecution agreement with the United States, there will be no forfeiture of their assets, whatever Guidelines fine may be imposed will not materially impact at least Mr. Vorley's finances, *see* PSR ¶ 107 (reflecting Vorley's net worth), and because

they are not U.S. citizens, even the usual collateral consequences of conviction are inapplicable to them.

In short, a serious crime merits serious treatment. To sentence these defendants to anywhere near what the PSR recommends risks creating the impression of a two-tiered justice system where well-heeled defendants are not held to account, and will embolden other fraudsters and manipulators to wreak havoc on the U.S. financial markets.

C. The Need to Avoid Unwanted Sentencing Disparities

To date, only one other non-cooperating defendant, Michael Coscia, has been sentenced in a spoofing case. Like Mr. Vorley and Mr. Chanu, Mr. Coscia also was convicted in a one-million-dollar spoofing scheme after a jury trial in this District. *See United States v. Coscia*, No. 14 CR 551, Sentencing Tr. (Doc. No. 162) ("Coscia Sentencing Tr.") at 17. The court determined the applicable Guidelines range to be 70 to 87 months and sentenced Mr. Coscia to 36 months of imprisonment. *Id.* at 50. To be sure, there were aggravating factors in Mr. Coscia's case that are not present here—notably, that the sentencing court found that Mr. Coscia testified falsely in his own defense at trial and applied an obstruction enhancement. *Id.* at 21-22. There also was a more direct connection between Mr. Coscia's spoofing profits and his own personal gain, *id.* at 47-48, although there certainly was testimony in this case from Mr. Liew that Deutsche Bank traders spoofed to make money, *see, e.g.*, Tr. at 723 ("spoofing was just one of the tools that we employed to help to get a better price, and with a better price, we get better profits"), keep their high-paying jobs, *id.* at 706-07,

and boost their bonuses, *id.* at 759. And of course, there was significant evidence that the defendants' spoofing *did* increase their profits. *See* GX 74 at 6-7.

There also were important mitigating factors in Mr. Coscia's case that are absent here, including Mr. Coscia's age and health, *id.* at 49, that Mr. Coscia's conduct spanned only ten weeks (as opposed to *five years*), *id.* at 29, and that Mr. Coscia showed some modicum of remorse and acceptance of responsibility at sentencing, *id.* at 49-50. And of course, the conduct at issue here was more serious than Mr. Coscia's in certain respects. Most significantly, the crimes in this case involved coordination between multiple highly-paid traders at a major international bank over several years, as well as false orders totaling nearly $75 billion. *See* Ex. A at 6. Moreover, the trial evidence clearly showed that Mr. Vorley lied to his employer when questioned about his unlawful trading practices, and Mr. Chanu openly joked with a co-conspirator (Mr. Bases) about their market manipulation. In connection with a pretrial motion, Mr. Vorley also submitted an affidavit to this Court, which the Court found not to be credible in various respects. *See* Mem. Opinion & Ord. (Doc. No. 185) at 5 n.4 & 14 n.8. And both defendants' trial strategies included maligning their victims as "sharks" and "parasites." For those reasons, the government believes the conduct in this case merits a higher sentence than Mr. Coscia received. That said, a sentence at the top of the applicable Guidelines range here (*i.e.*, 71 months) would be nearly double Mr. Coscia's sentence and likely higher than necessary to accomplish

the purposes of sentencing.

Also relevant to the need to avoid unwarranted disparities is the Court's sentencing last year of Jiongsheng "Jim" Zhao. As the Court may recall, Mr. Zhao was engaged in a four-year spoofing scheme that caused $464,300 in loss to other market participants but netted him only $21,000. *See Zhao* Sentencing Tr. at 5, 33. Mr. Zhao pleaded guilty and cooperated with the government's investigation, which the Court described as the "principal mitigating factor." *Id.* at 29-30. Mr. Zhao had spent 302 days in custody, including in conditions that were "particularly harsh" while awaiting extradition from Australia, *id.* at 32-33, and the Court sentenced him to time served, *id.* at 35. It would be striking for Mr. Vorley and Mr. Chanu—whose crimes lasted longer and resulted in greater harm, and who neither accepted responsibility nor cooperated—not to receive significantly longer custodial sentences than Mr. Zhao.[10]

D. Restitution

Restitution is mandatory in this case. *See* 18 U.S.C. § 3663A. However, pursuant to a deferred prosecution agreement entered into between the United States and Deutsche Bank, Deutsche Bank has already paid into an escrow account the full amount of money necessary to compensate any and all victims in this case, and the United States is administering these payments. As such, and because victims cannot

[10] For the Court's reference, the defendants' co-conspirator, Mr. Liew, is currently scheduled to be sentenced by the Honorable Charles R. Norgle on September 14, 2021. Mr. Liew's plea agreement reflects the parties' agreement that his total offense level under the Guidelines is 17, and he faces an advisory sentencing range of 24 to 30 months (before any motion the United States may file under Section 5K1.1 of the Guidelines).

be made whole twice, the defendants' restitution obligation has been fully satisfied.

V. Conclusion

For the foregoing reasons, the government seeks a sentence of imprisonment at the lower end of the applicable Guidelines range (57 to 71 months) for each defendant.

Respectfully submitted,

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CERTIFICATE OF SERVICE

I certify that by electronically filing a copy of the foregoing sentencing memorandum through the court's electronic docketing system on May 21, 2021, I caused the motion to be filed on the defendants' counsel of record, who are ECF Filing Users and are served electronically by the Notice of Docket Activity.

/s/ Leslie S. Garthwaite
Leslie S. Garthwaite
Trial Attorney, Fraud Section