

June 21, 2022

Vanessa Countryman, Secretary  
U.S. Securities and Exchange Commission  
100 F Street, NE, Washington, DC 20549-1090.

Re: Request for Comment on Proposed CAT NMS Funding plan (File Number 4-698)

Dear Ms. Countryman:

I appreciate the opportunity to comment on the proposed CAT NMS Funding Plan changes (“the Proposal”).

I serve on the CAT NMS Advisory Committee in the position reserved for an academic. I write today in my name only. My comments represent my opinions only and not necessarily those of any of my Advisory Committee colleagues, Interactive Brokers for whom I serve as the lead independent director, any of the mutual funds for which I am a director or trustee, or my employer, USC. Moreover, none of these entities reviewed or limited my comments.

The CAT NMS Funding Plan should be fair and not create economic disincentives that burden competition or reduce market quality. The reasons motivating these objectives are obvious. The CAT NMS Plan approved by the Commission clearly identifies these objectives.

Section 11.1(c) of the CAT NMS Plan requires that the CAT NMS costs be “fairly and reasonably shared among the Participants and Industry Members.”

Section 11.2(e) requires that the funding plan “avoid any disincentives such as placing an inappropriate burden on competition and a reduction in market quality.”

I found the proposed funding plan arbitrary and largely unfounded on principles upon which the Commission could reasonably conclude that CAT NMS would be fairly funded.

This letter identifies two broad, well-accepted principles the Commission could use to evaluate fairness. I describe how to implement them and introduce a new funding model based on these principles. I then briefly discuss some features of the Operating Committee’s proposed plan that I find arbitrary, unfair, and economically distorting. Finally, I conclude with some recommendations.



## The Distribution of Fees

Before addressing these issues, consider first the issue that concerns most people addressing funding fairness—the distribution of funding responsibility between the Participants and the Industry Members. As an economist, I recognize that this split does not matter much in the long run. It has only minor secondary effects on these two groups.

The primary effect—who ultimately bears the economic cost of these fees (as opposed to who pays them), does not depend on the split. Because the markets for exchange, dealing, and brokerage services are all highly competitive in the long run, any fees imposed on any of these groups will ultimately pass through to the retail and institutional traders who use the markets.

In highly competitive markets, prices reflect the costs of doing business in the long run. If those costs rise, they ultimately pass through to the customers. For example, if the Participants (primarily exchanges) were required to fund CAT NMS fully, they will raise their fees (or fail to lower them when costs are falling) to recover their funding costs. And if brokers' business models require that they pay exchange fees on behalf of their clients, the brokers will raise their commission rates to the customers. And if their business models require zero commissions, brokers will provide fewer services or charge more for non-transaction services to cover their increased costs.

These conclusions are well-established in economic theory and empirical tests of that theory across many industries. They obtain when entry and exit from a competitive industry are easy or marginal costs of providing services do not vary much with volume. Both conditions characterize most sectors of the markets for exchange, dealing, and brokerage services, and only one condition (either) is necessary for the result in industries with many competitors.<sup>1</sup>

The primary secondary effects of imposing fees on one group versus another will appear in their income statements. Those entities most responsible for funding CAT NMS will report higher costs and, in the long run, higher incomes. As a result, their profit margins will appear smaller, and any regulatory or lender-imposed ratio requirements that depend on these income statement items will be distorted somewhat. (Note that most regulatory ratios depend on balance sheet items, which would be unaffected.)

In the short run, who must pay these fees matters because prices often take a while to adjust. But eventually, the retail and institutional traders who use the markets will bear these fees.

These secondary effects suggest that CAT NMS may be best funded through charges imposed directly on traders, as are the SEC's Section 31 fees. This outcome does not distort income statements. It also is reasonable as traders are the ultimate beneficiaries of the CAT NMS

---

<sup>1</sup> Entry is expensive for entities that must invest substantially into building and maintaining low latency systems, but their systems, once built, tend to have near-constant marginal costs of operation.

system. And it reflects the reality that retail and institutional traders will bear these fees in the end.

## Potential Fairness Principles

Fairness ultimately depends on personal values. Universally accepted standards of fairness do not exist. What seems fair to one may not to another, especially when they must distribute costs between them. In such situations, people commonly adopt self-serving concepts of fairness.

But people will often accept policies as fair—or at least tolerable—when they are based on broadly accepted general principles. For example, one or both of the following two economic principles could provide a fair basis for the CAT NMS funding.

- The **Cost Recovery Principle** asserts that everyone should fund the costs of their activities. As discussed below, this principle also tends to promote economic efficiency. Closely related to this principle is the more general principle that nobody should have to subsidize services others receive.
- The **Benefits Received Principle** asserts that people should pay for their benefits.

These two principles respectively address fairness issues from production and usage perspectives.

## The Cost Recovery Principle

A CAT NMS funding plan based on cost-recovery principles would impose fees on activities in proportion to the costs the activity imposes on the system. CAT NMS would base these fees on estimates of accounting costs. Such fees would promote economic efficiency by forcing traders to bear the costs they directly or indirectly impose on CAT NMS.

Most CAT NMS costs are proportional to the messages the system receives and archives for subsequent retrieval. Accordingly, since the costs of processing most messages are the same regardless of their type, such a policy would impose a flat fee on all messages. To do otherwise would be economically inefficient (and potentially perceived as unfair) because the funding system would discourage or encourage the use of processes that generate messages with higher or lower fees. If fees vary by security or message type without a cost basis, the high fee payers will subsidize the low fee payers. Most people consider such results unfair unless other issues justify the differences.

The Operating Committee discusses message traffic fees in the proposed funding plan release (the “Message Traffic Model”).<sup>2</sup> Then, without further explanation, it dismisses this model in two sentences over concerns about fee predictability and complexity.

### ***Fee Predictability***

Variation of message traffic through time presumably motivates the fee predictability concern. But share volumes also vary over time, and their variation correlates highly with the variation in message counts. The predictability concern thus also applies to the Executed Share Model, but the Proposal does not note this inconsistency. However, the Proposal tacitly acknowledges the share volume predictability problem because it includes an annual (and semi-annual if necessary) fee adjustment mechanism to deal with it.

Concerns about funding predictability derive from, and are subordinate to, concerns about whether funding will cover expenses, which are also uncertain. Since expenses correlate highly with message traffic, fees based on message traffic reduce the overall funding uncertainty to which CAT NMS is subject. Thus, if predictability is a significant concern, the Message Traffic Model is better than the Executed Share Model because it would produce less variation in the net CAT NMS cash flow.

### ***Complexity***

The Proposal discusses the complexity issue in one sentence:

“It (the use of message traffic) also introduced complexity to the model, as discounts were necessary for certain types of activity to avoid fees that may adversely impact market making activity and other market activity.”

This sentence asserts a conclusion (“discounts were necessary”) without identifying the “certain types of activity” that need discounted message traffic fees to avoid adversely impacting “market-making activity and other market activity.”

Evaluating this conclusion is impossible without knowing the activities to which it refers. Without further explanation, relying on this argument to decide CAT NMS funding issues would be irresponsible.

Fortunately, guessing which market-making activity concerns the Operating Committee is easy. This reference undoubtedly is primarily to market-making in listed options contracts as they generate a vastly disproportionate share of CAT NMS message traffic compared to their transaction volumes.

---

<sup>2</sup> See Section 6(d) at page 43.

If message traffic fees were not discounted for options market quotation messages, the options markets would bear a large fraction of CAT NMS funding under the Message Traffic Model. The Operating Committee apparently argues that it cannot use the Message Traffic Model without providing discounts to entities that produce high message volumes without impacting their market-making. In particular, if faced with higher fees for producing quotes, the options markets presumably would disseminate fewer quote updates, which would impact market-making.<sup>3</sup>

This argument is troubling since not using the Message Traffic Model leads to an unfair outcome. If option market entities do not pay all the costs they impose on CAT NMS, entities in the equity markets will subsidize options market trading.

It also leads to an inefficient outcome. When entities in the options markets do not pay all costs associated with their operation, they have little incentive to control those costs.

The likely explanation for the Operating Committee's position on this issue (and perhaps also why its argument in the Proposal is so cryptic) involves a market structure issue: The options markets generate a blizzard of quotes because they have created far more strike prices, maturity dates, and exchanges than are necessary to serve the public adequately.<sup>4</sup> Instead, in the name of providing more instruments and service opportunities to the public, the options markets have fragmented customer order flow to reduce the probability that natural buyers and natural sellers will trade with each other without the intermediation of dealers. The dealerization of the nominally order-driven option exchange markets<sup>5</sup> also allows brokers to receive various order flow inducements (payments for order flow) from exchanges that their designated market-making dealers ultimately fund. Brokers would not receive these inducements were it not for the many options exchanges where exchange rules ensure that their designated dealers will fill the orders that the dealers indirectly pay brokers to route to their exchanges.

Everyone in the food chain—brokers, dealers, and exchanges—benefit from the dealerization of the options markets. These benefits come at the expense of the

---

<sup>3</sup> To what the final phrase "other market activity" in this sentence refers is less clear. Perhaps the Operating Committee is concerned that options market trades would decline if the markets disseminated fewer quotes.

<sup>4</sup> For example, on June 21, 2022, when UNG (US Natural Gas ETF) traded around \$23.50, the options markets were continuously streaming quotes for 08 July 2022 put and call option contracts at 48 different strike prices ranging from 17 to 47 with most only 0.50 apart. Quotes were streaming for similar numbers of contracts for a total of 10 expirations dates ranging from 24 June 2022 to 19 January 2024. Thus, quotes were streaming for a little less than 1,000 contracts. For most contracts, 16 different exchanges were streaming quotes, so CAT NMS was taking in quotes from approximately 15,000 contract-exchanges, all for only one of thousands of equities with listed options. Although UNG is among the most actively traded securities, it is not unusually so. The options markets produce enormous numbers of messages.

<sup>5</sup> Listed options trade only in exchange markets because the Options Clearing Corporation will clear only options traded in these markets.

customers for whom liquidity is more expensive than in less fragmented order-driven markets.

The Operating Committee's concern about adversely impacting market-making is misplaced. If the options markets bore more of the costs of their quote messages, they would likely pare back the number of contracts offered (fewer strikes and maturity dates), and some options exchanges that currently are little more than dealer fronts might close. Although some market-makers may be hurt, the public would benefit from order-flow consolidation into true order-driven markets. Overall, liquidity would improve.

Options market structure is not a primary CAT NMS issue, but CAT NMS cannot ignore the enormous volume of options data flowing into it due to the options market structure. Since capturing and archiving these data significantly affects CAT NMS funding requirements, the CAT NMS funding model must reflect its costs. Failing to do so ensures that the equity markets will subsidize the options markets.

### ***An Important Tangential Observation***

If CAT NMS consistently applied the Cost Recovery Principle to price all costs imposed on it by all users, CAT NMS also should charge regulators who query the CAT NMS system for the costs of filling their queries. Those costs should include both the costs of creating systems capable of filling queries and the costs of actually filling the queries.

Such charges are currently politically untenable. But the failure to appropriately charge for queries will undoubtedly result in system overuse as regulators will not bear the costs they impose on CAT NMS. Failing to address this issue will make operating CAT NMS more expensive than it should be. It will also result in inefficient allocation of query resources as regulators with low-value queries displace those with higher-value queries. Regardless of how CAT NMS is funded, CAT NMS and the Commission should address this issue to ensure that CAT NMS does not become too expensive or poorly used.

### **The Benefits Received Principle**

Another common fairness principle is that people should pay for what they get. A fee plan based on this principle would estimate the economic benefits CAT NMS produces for traders and perhaps also the general public.

The CAT NMS system collects data and facilitates retrieval by regulators whose mission is to promote the benefits our economy obtains from well-functioning markets. The service helps regulators improve market quality by facilitating enforcement efforts, increasing deterrence, and making better decisions about market structures.

The benefits of well-functioning markets are of two types:

- *Private benefits* are the benefits traders (and their clients) obtain from using well-functioning markets. These benefits primarily include investment services (moving money from the present to the future), financing services (moving money from the future to the present), risk transfer (hedging), and capital formation (raising money to undertake projects too big or risky for most market participants).
- *Public benefits (externalities)* are those benefits everyone in our economy obtains from the economic efficiencies that well-functioning markets promote. These primarily include efficient capital allocation decisions that depend on informative prices and efficient production decisions that result when producers can reduce their exposures to the risks that scare them.

A funding policy designed to allocate CAT NMS funding to its ultimate beneficiaries most recognize at least two important issues:

- CAT NMS can only charge market participants. CAT NMS cannot charge people who do not participate in the markets. The government could enhance economic efficiency by subsidizing the markets that produce public benefits, but such funding (beyond that already allocated to public agencies such as the Commission for enforcement and regulatory efforts) is not politically feasible.
- CAT NMS's private and public benefits are greatest in those markets most subject to abuse. But identifying such markets is difficult to impossible. While people might identify markets with the most significant enforcement problems as those that would most benefit from the CAT NMS facility, note that the CAT NMS deterrence effects reduce the need for enforcement and thus benefit traders and the public. Accordingly, identifying benefits based only on enforcement histories would be inappropriate.<sup>6</sup> Thus, allocating funding differentially to different market sectors based on the actual benefits the program delivers to those sectors would be impossibly difficult.

These issues suggest that the best CAT NMS can do under the Benefits Received Principle would be to raise funds uniformly in proportion to some common measure of market usage, assuming that economic benefits are in proportion to market usage. This assumption reduces the problem of measuring benefits to how best to define market usage uniformly across market sectors and instruments.

---

<sup>6</sup> This problem is the same as that of identifying the impact of a successful police force: Measuring what enforcement problems would exist if enforcement did not exist is difficult to impossible.

Markets exist primary to transfer risk from one entity to another. Accordingly, if CAT NMS were to assign funding to users in proportion to their usage, the fees should be proportional to the dollar value of the risk transferred in each transaction (the “Risk Transfer Model”).<sup>7</sup>

Measuring risk transfer for equity transactions is relatively easy. However, measuring risk transfer for options contract transactions is more complicated, as is the case with all issues involving options.

### ***Risk Transfer in Equity Transactions***

For computing CAT NMS fees, the principal dollar value of a transaction (“Sales Value”) provides a suitable measure of the equity risk transferred in the transaction.<sup>8</sup> This measure could be adjusted with risk measures such as stock betas, return standard deviations, and capital leverage ratios to further characterize the volume of equity risk transfer, but such adjustments would unnecessarily complicate the funding plan.

The sales value of a stock transaction closely measures its total risk transfer. It underestimates risk transfer for low beta and low volatility securities, and it overestimates risk transfer for high beta and high volatility securities, many of which may be securities of highly leveraged companies. But the variation across securities in beta and total volatilities is small compared to other volume measures, such as share volumes which depend on price levels. Most cross-sectional variation in these other risk measures is between 50% and 150% of their mean values. In contrast, the cross-sectional variation in share volumes is more than ten times greater due to variation in price levels (holding constant total capitalization).

### ***Risk Transfer in Options Transactions***

The equity risk transferred in an equity options trade is equal to the option’s delta times the equity risk of the underlying security, the latter of which can be proxied by equity sales value as discussed above. Option deltas are readily computed based on the Black-Scholes model. They are widely available in real-time.

CAT NMS could base its fees on regularly computed option deltas and underlying security values. However, using these data would require additional specifications of how they should be sourced and computed. For example, the funding plan would need to specify what underlying security value to use—last price or midpoint spread—and what to do when neither is available. The plan would also have to specify other variables needed to compute delta: the expected volatility, the risk-free interest rate, and the expected dividend rate.

---

<sup>7</sup> Transactions, and not orders, because orders are only the means to producing the benefits that come from transactions.

<sup>8</sup> If the leverage ratios for those equity instruments whose design embodies leverage (the levered ETFs) are readily available, risk transfer should be estimated by the sales value times the absolute value of the leverage ratio.



These data are not available at the point of sale. Basing fees on these values thus would impose substantial data processing costs upon the Participants and Industry Members as they would have to bring additional information to the point of sale to compute the fees.

Fortunately, enough information is available at the point of sale to provide low-cost estimates of equity risk transfer suitable for computing CAT NMS fees. First, note that the option strike price and maturity date are readily available at the point of sale because the option ticker symbols encode them. Using these data and option trade prices, analysts easily can imply the underlying equity sales value (stock price in the Black-Scholes formula) with given values for underlying equity volatility, the risk-free interest rate, and the expected dividend rate. By specifying constant common values for these variables for all options, CAT NMS can ensure that all information necessary to estimate equity risk transfer is available at the point of sale. Analysts then could estimate the equity risk transfer by multiplying the implied equity sales value by the option delta, which they can also compute from these data.

The result would be a reasonable estimate of the equity risk transferred in an options trade suitable for computing CAT NMS fees. The quality of the estimate would depend on how closely the common assumed values for equity volatility, the risk-free interest rate, and the expected dividend rate are to their actual values.<sup>9</sup> For most listed equity options, the errors in the latter two rates will not affect the results much as these variables do not contribute much to option pricing. The constant volatility assumption is critical but necessary to calculate the fee at the point of sale without linking other data.

Reasonable annual values for volatility, the risk-free rate, and the expected dividend rate would be around 30%, 3%, and 1.5%, respectively. CAT NMS would specify values to best represent the universe of traded listed options, and reset these values, if necessary, every few years.

Table 1 shows how the equity risk transfer estimation error would depend on the constant volatility assumption. For various call strike prices, the table presents the percentage difference between the actual risk transferred based on various true volatilities and the estimated risk transfer based on assuming 30% volatility. No differences appear in the 30% volatility column because the assumed and actual volatilities are equal.

---

<sup>9</sup> The estimate quality also depends on how well the Black-Scholes model represents option valuation characteristics. Although the model is well-known to have several shortcomings, it is well-accepted among practitioners who regularly use it to compute various characteristics associated with options pricing, such as implied volatilities and the various greeks, including, most importantly, delta.

**Table 1. Percentage differences between estimated equity risk transfer based on 30% volatility and the actual equity risk transfer based on actual volatilities and underlying values for call options.** All numbers in the table are in percent. The assumed risk-free and dividend rates are 3% and 1.5%, and the time to maturity is assumed to be three months. The estimated equity risk transfer is computed using the Black-Scholes model to imply the underlying stock price from the Black-Scholes call price, assuming that the volatility is 30 percent. This implied stock price is then used to compute the call option delta, again using the 30 percent volatility. Estimated risk transfer is the product of this delta and the implied stock price. The actual risk transfer is the product of the actual delta and the actual stock price.

		Actual Annual Volatility							
		15	20	25	30	35	40	45	50
Call strike price, as a percent of underlying stock value	70	-1	-1	-1	0	1	2	4	6
	80	-6	-5	-3	0	4	7	11	15
	90	-22	-15	-7	0	7	13	19	25
	100	-37	-23	-11	0	10	18	26	33
	110	-44	-28	-13	0	12	22	32	40
	120	-47	-30	-14	0	13	25	35	45
	130	-48	-31	-15	0	14	27	38	49

For actual volatilities higher than the assumed 30% volatility, the estimated risk transfer is higher because the actual call prices are higher, which causes the implied stock price to be higher under the 30% volatility assumption. The model likewise underestimates implied transfers for lower actual volatilities.

The relatively high positive and negative percentage differences that appear for the deep out-of-the-money options at the bottom of the table are due to the low actual and estimated risk transfers for these options, which holders are unlikely to exercise. As a result, these options' absolute differences (not shown) are all small.

The low relative differences for the deep-in-the-money options that appear at the top of the table are due to the actual and estimated risk transfers for these options being nearly equal to the value of the underlying shares. Holders will likely exercise these options, so they are good substitutes for holding stock.

Analysts can do the above calculations at the point of sale without looking up any additional information. Any coder familiar with option pricing theory can easily do them.

### ***The Operating Committee's Sales Value Model***

The Operating Committee discusses basing funding on sales value (the "Sales Value Model") in the proposed funding plan release in Section 6(f) at page 44. The Operating Committee considers only a model in which the same rate would apply to sales value regardless of the trade product type. It dismisses that model after observing that the "Sales Value Model would

impose a disproportionate share of the CAT costs on Participants and Industry Members trading NMS Stocks versus Listed Options.”

The Operating Committee obtains this result because it applies an equal fee rate to the sales value of all instruments. Since options contract prices (sales value) are low relative to the risk that they transfer, funding based on this concept would place a disproportionate share of the CAT costs on stock traders versus options traders. The result is due to the leverage inherent in options contracts.

The Operating Committee’s explanation for rejecting the Sales Value Model indicates that it implicitly believes that applying the same fee rate to the sales values of highly levered options and unlevered stocks would be unfair. I concur. The Operating Committee’s concern about this issue is consistent with the Benefits Received Principle.

The Committee may have chosen the Executed Share Model because it was unaware of the Risk Transfer Model described above. This model would allow it to collect fees for options contracts based on the total equity risk they transfer, which is a function of their sales value and contract specifications. The Risk Transfer Model provides a practical and theoretically sound way to adjust option sales values to place them on the same basis as equity sales values.<sup>10</sup>

## **Specific Problems with the Proposed Funding Plan**

The Executed Share Model proposed by the CAT NMS Operating Committee has several characteristics inconsistent with the abovementioned fairness principles.

1. The Executed Share Model would charge fees on NMS Stocks in proportion to the number of shares traded without regard to the dollar size of the transaction.
  - A 100-share transaction in a \$2 stock would impose the same fee obligation as a 100-share transaction in a \$2,000 stock, despite the 1,000-fold difference in principal value and associated risk transferred. No principle suggests that this outcome is fair.
  - A 10,000-share transaction in a given stock would pay a fee 100 times larger than a 100-share transaction in the same stock. This outcome is consistent with the Benefits Received Principle (for a given stock but not across stocks). But it is inconsistent with the Cost Recovery Principle because both transactions impose the same costs on CAT NMS.

---

<sup>10</sup> The Committee also may have chosen the Executed Share Model because it was unaware that computing reasonable risk transfer estimates for options at the point of sale without accessing additional data is not costly.

2. The Executed Share Model proposes to charge fees on listed options based on the multiplier applicable to the contract. (Most options contracts would count as 100 equivalent NMS Stock shares).
  - The proposed fee structure would charge the same fee on a deep out-of-the-money option contract as on a deep-in-the-money contract, even though the former may transfer 100 times more risk. This difference is unfair.
  - Since all options contract trades transfer less risk than equity trades of the same nominal number of shares in the underlying security, the proposed Executed Share Model fees always will be greater, on a risk-transferred basis, on options trades than on equity trades. Options trades thus are unfairly burdened.

To illustrate this burden, note that the purchase of a call option coupled with the simultaneous sale of a put option transfers essentially the same risk as a single trade of the nominal shares in the underlying (the put-call parity result). But the two options trades would generate twice the fees of the single equity trade under the Executed Share Model.

- One might argue that the higher fees on options contracts reflect their greater complexity and thus greater associated enforcement costs. One might also argue that the higher fees reflect the vastly greater message processing costs these markets impose on CAT NMS due to the high ratio of quotes to trades in the options market. But neither argument suggests that the fees collected for options should average twice those for equities. Moreover, assigning equivalent shares to options trades based on their nominal multiplier is arbitrary. And if the number of messages is the determining principle, why not directly assess fees on this basis?
3. The Executed Share Model proposes charging OTC Equity Securities fees at 1/100 of the NMS Stock rate. (Each OTC share traded would count as only 0.01 equivalent NMS shares). This distinction reflects the fact that many OTC equity securities are very low priced and thus have very high share trade sizes.
    - Not all OTC equity securities are low-priced. Charging fees 100 times smaller for identical-sized transactions for OTC and NMS stocks that trade at the same price unfairly subsidizes the OTC market.
    - This adjustment ensures that fees for OTC and NMS security transactions with similar values will be roughly similar, consistent with the Benefits Received Principle. But roughly applying this principle only across the two marketplaces when it would be so easy to apply it consistently across all securities regardless of where they trade is arbitrary.

- The 0.01 equivalent share factor is arbitrary. Nothing about the market structures of the two marketplaces suggests this ratio. If it is to be retained (which I do not recommend), CAT NMS should do the research necessary to identify that share factor that best matches OTC and NMS security trade values.

## **Conclusion and Recommendation**

This comment letter suggests two broadly accepted principles policymakers could use to identify a fair CAT NMS fee plan. Although other principles may exist, the Cost Recovery Principle and the Benefits Received Principle are widely respected.

The funding plan need not focus on only one principle and exclude the other. CAT NMS may reasonably base its funding on both principles.

### ***Recommendations***

Neither the Cost Recovery Principle nor the Benefits Received Principle is inherently fairer. The former focuses more on production-side perspectives, while the latter focuses more on the user-side. Thus, since both perspectives are merit worthy, and neither is particularly expensive to implement, CAT NMS should employ both approaches when raising its funds.

Specifically, CAT NMS should collect a fixed fee per archived message from all entities that create such messages. In addition, CAT NMS should collect a fee charged to traders proportional to the value of the underlying equity risk exchanged using the Risk Transfer Model discussed above.

Although a 50:50 split of the funding raised under the two approaches might seem reasonable, several observations suggest that the funding plan should give greater weight to the Cost Recovery Principle. First, charging fees in proportion to costs promotes economic efficiency by forcing participants to internalize the costs of their activities. Second, analysts can more accurately measure costs than benefits (which they must ultimately assume are proportional value traded). Finally, although risk transferred can be readily estimated, its connection to CAT NMS benefits received is abstract. Accordingly, based on these observations, I would allocate 75 percent of CAT NMS Funding to cost recovery fees based on message counts.

As discussed above, this allocation places a substantial fraction of the funding costs on the listed equity options markets because they generate a disproportionate share of messages. This outcome is appropriate because their quotation systems impose substantial costs on CAT NMS. Without message-count-based fees, equity traders will unfairly subsidize options traders, and options markets will not face appropriate incentives to control their costs.

If policymakers decide not to impose message fees, they should switch the funding mechanism from the Committee's proposed Executed Share Model to the Risk Transfer Model described above. Both models reflect market activity, but the former model is arbitrary. In contrast, the

latter model provides a consistent, equitable method of fairly collecting fees across all types of instruments rooted on the well-accepted Benefits Received Principle.

### ***Some Final Comments***

I concur with the Operating Committee's proposed elimination of tiered pricing and fixed fees. This unnecessarily complex system creates perverse incentives around tier thresholds and burdens competition by increasing the costs of new entrants.

I suggest that CAT NMS operate the rate-setting mechanism on a rolling 12-month (or longer) basis rather than targeting funding for each year. As proposed, the Operating Committee will calculate fees at the beginning of the year and may choose to adjust fees once during the year due to changes in actual or projected costs or revenues.

This system is identical to the Section 31 fee-setting process, which I helped oversee as Chief Economist of the Commission. The midyear adjustment of Section 31 fees to year-to-date revenue and cost realizations and expectations for the remainder of the year introduces substantial and largely unnecessary variation into the mid-year adjusted fee rates.

Adjusting fees on a rolling basis that looks to expected revenues and costs over the coming 12 months (or longer) rather than just through the end of the current year would be better. Although I have no specific knowledge, I suspect statutory considerations require the SEC Section 31 fees adjustment procedure. CAT NMS probably does not face such issues. Adjusting fees on a rolling basis would ensure that they are more stable while producing financing costs (of shortfalls) and investment returns (of surpluses) that CAT NMS can easily accommodate.

If I can further assist the Commission with these issues, please do not hesitate to contact me.

Sincerely,



Larry Harris  
Fred V. Keenan Chair in Finance  
USC Marshall School of Business

cc:

The Honorable Gary Gensler, Chairman  
Mr. Haoxiang Zhu, Director, Division of Trading and Markets  
Ms. Jessica Wachter, Chief Economist and Director, Division of Economic and Risk  
Analysis  
Mr. Michael Simon, Chair, CAT NMS Plan Operating Committee  
Ms. Judy McDonald, Chair, CAT NMS Advisory Committee