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Via Electronic Mail

Ms. Elizabeth M. Murphy
Secretary
Securities and Exchange Commission
100 F Street, NE
Washington, D.C. 20549-1090
rule-comments@sec.gov

Re: File No. SR-ISE-2012-22

Dear Ms. Murphy:

Chicago Board Options Exchange, Incorporated ("CBOE") hereby submits comments on the proposed rule change of International Securities Exchange, LLC ("ISE"), rule filing number SR-ISE-2012-22[1] (the "ISE Proposal") and on the questions identified by the U.S. Securities Exchange Commission (the "Commission") in its order instituting proceedings as to whether to disapprove the ISE Proposal (the "OIP").[2]

Summary

ISE proposes to establish a pilot program under which ISE would list and trade options (the "Proposed Options") overlying a benchmark that ISE refers to as the "ISE Max SPY Index." The ISE Proposal should be disapproved because it would expose investors to unnecessary risk and would mislead them about the nature of the Proposed Options. Approval of the ISE Proposal therefore would be inconsistent with the Securities Exchange Act of 1934 ("Exchange Act"). First, it would create a serious risk of market disruption and investor harm if trading in those options were allowed to commence before all judicial challenges to the lawfulness of the Proposed Options have been resolved, because ongoing state court proceedings could result in an injunction that prohibits trading in those options. Second, it is misleading for ISE to characterize the Proposed Options as options on the "ISE Max SPY Index" – because the settlement value of the Proposed Options would be based on a different benchmark than that "index" and because the "ISE Max SPY Index," which purportedly consists of only a single component security, does not even qualify as an index. Third, investors would be confused by the two different values used by ISE (*i.e.*, the ISE Max SPY Index value and the settlement value) and misled into believing that the ISE Max SPY Index value has a bearing on the rights and duties under the

[1] *See* Securities Exchange Act Release No. 66614 (March 16, 2012), 77 FR 16883 (March 22, 2012) (noticing SR-ISE-2012-22).

[2] *See* Securities Exchange Act Release No. 67225 (June 20, 2012), 77 FR 38100 (June 26, 2012) (order instituting proceedings to determine whether to approve or disapprove proposed rule change).

Proposed Options. Fourth, ISE's disclosure about how it would calculate the settlement value of the Proposed Options is unclear, incomplete and internally inconsistent, so that approval of the ISE Proposal would be inconsistent with the statutory mandate to protect investors.

I. A Risk of Market Disruption and Investor Harm Would Result if Trading in Proposed Options Commenced Before Judicial Challenges Are Resolved (SEC Issue 1).

The Commission seeks comment on whether "market disruption and harm to investors" would result if the Commission approved the ISE Proposal and ISE commenced trading the Proposed Options before "all judicial challenges to the lawfulness of the proposed options under state law have been resolved." OIP, 77 FR at 38106, Issue 1. That scenario *would* create a risk of serious market disruption and investor harm, and it would be inconsistent with the Exchange Act to expose investors and the market to this avoidable risk.

As explained in the OIP, ISE is subject to an injunction (the "Injunction") that prohibits ISE from listing or offering trading on options on the S&P 500 index, and the owner of the index, Standard and Poor's ("S&P"), and CBOE have brought a motion (the "Motion") in Illinois court to prevent the listing or trading of the Proposed Options, on the ground that those options are disguised S&P 500 Index options and therefore would violate the Injunction. *See* OIP, 77 FR at 38102. ISE has promised the Commission not to commence trading of the Proposed Options until the lower Illinois court has ruled on the Motion. *See* OIP, 77 FR at 38102-03. However, the ruling by a lower court may not end the litigation over whether the Proposed Options may be legally traded under state law. Accordingly, if trading commences in the Proposed Options on the basis of a lower court ruling favorable to ISE, investors would be in peril that a later judicial decision would enjoin further trading of the Proposed Options, which would leave investors locked into existing positions with no readily available means to trade out of those positions. Because the ISE Proposal would expose investors to this risk, it fails to protect investors or the public interest and therefore is inconsistent with the requirements of the Exchange Act.

In response, ISE states that it would ask the state court to permit closing-only transactions if trading in the Proposed Options were enjoined after having commenced, and ISE proclaims that it is "inconceivable" that a court would not permit such a closing-only market.[3] This assurance is hollow, because it is impossible to know what a court would do. It is far from "inconceivable" that, once it has determined that the Proposed Options violate the index owner's property rights, a court would be unwilling to force S&P to endure the further infringement of those property rights that close-out trades would inflict. It is an extreme exercise of judicial power to take away private property without compensation.[4] But that is what a court would need to do to allow closing transactions after it had determined that trading the Proposed Options infringes S&P's property rights and is thus unlawful. ISE cannot guarantee the Commission or

[3] Letter from Michael J. Simon, Secretary and General Counsel, ISE, dated June 15, 2012 (the "ISE Letter II"), p. 4.

[4] In fact, a plurality of the U.S. Supreme Court has recognized that judicial actions that take private property without compensation may violate the U.S. Constitution. *Stop the Beach Renourishment, Inc. v. Fla. Dept. of Environmental Protection*, 560 U.S. 2606, 130 S.Ct. 2592 (2010).

investors that a court would allow closing transactions under those circumstances.[5]

Moreover, there would be serious risks to investors even if closing-only transactions *were* allowed. First, the court would likely put a deadline on any such transactions. Investors therefore could be forced to close out their positions at an economically inopportune time. If an investor's position in the Proposed Options hedged other investments, the need to close out the Proposed Options position ahead of schedule could disrupt or destroy that hedge and create new and unintended market risks. Further, the market for closing-only orders of the type ISE hopes the court would permit would be relatively illiquid, which would subject market participants to the risk of unpredictable and economically inefficient prices.

ISE has implicitly recognized that investors would be subject to material risks like these if the Injunction were applied to the Proposed Options after trading had commenced. ISE acknowledges that it would need to provide investors with a "litigation risk" disclosure in the Options Disclosure Document ("ODD") and that the appropriate disclosure would be "substantially similar to the litigation risk language that was included in prior versions of the [ODD] with respect to Index Participation products." ISE Letter II, pp. 4-5. However the Index Participation ("IPs") disclosure underscored the very risk that ISE now purports to discount – the risk that investors would *not* be able to close out their positions if the Proposed Options were enjoined. For instance, the IPs disclosure expressly acknowledged that permission to engage in closing-only transactions is only one possible outcome in the event of an injunction and that it is also possible that trading may "be promptly *terminated in whole* or in part," that the enforcement of performance of the terms of the [contracts] might be restricted or *even prohibited*," and that a court's actions and "the legal and market consequences of such actions *cannot be predicted with certainty*."[6] ISE's own proposed disclosure therefore refutes the easy assurances ISE urges on the Commission.

In addition, ISE's proposed disclosure actually would make it *less* likely that a court would allow closing transactions after it enjoined trading of the Proposed Options. While the law sometimes protects the rights of third parties, it typically only protects "innocent" third parties who take possession or title to assets, goods, or other property in good faith and without actual or constructive knowledge that their possession or title could infringe on the rights of another party.[7] Investors in the Proposed Options would not be able plead innocence, though, in

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[5] For an example of the difficulty in foreseeing whether a court will permit an equitable remedy that infringes on the rights of others, compare *Lemon v. Kurtzman,* 411 U.S. 192 (1973) (permitting reimbursement to nonpublic schools for expenses incurred in reliance on a statute that was subsequently declared unconstitutional) with *New York v. Cathedral Academy,* 434 U.S. 125 (1977) (invalidating a statute permitting similar reimbursement under fairly similar circumstances).

[6] April 19, 1989 Supplement to Index Participation Disclosure Document, a copy of which is attached as Exhibit 1 (emphasis added).

[7] *See, e.g.,* Federal Debt Collection Procedures Act, 28 U.S.C. § 3308 (providing for a good faith defense for transferee that take without knowledge of the transferor's fraudulent intent); U.C.C. § 2-403 (permitting a person with voidable title to transfer good title to a good faith purchaser for value); U.C.C. § 8-302 (permitting a "bona fide purchaser" who takes delivery of investment securities in good faith and without notice to any adverse claim to acquire rights in the security free of any adverse claim); and Unif. Fraudulent Trade Act § 8(a) (permitting a good (continued)

light of the "litigation risk" disclosure that ISE would and must make to all investors. Because ISE would pattern its disclosure after the IPs disclosure, ISE would need to explain in reasonable detail that it is being alleged that the Proposed Options are unlawful under an *existing* injunction. Investors who traded Proposed Options in the face of such a disclosure would assume the risk that the options were unlawful and therefore would be ill-positioned to ask a court to further impair S&P's property rights to accommodate their closing transactions.

ISE's argument may be that investors should be free to take the material risk that a later injunction would lock them into existing positions in the Proposed Options or otherwise would expose them to market risks. That callous approach would be inconsistent with the Exchange Act's goal of protecting investors. Although investors would be deemed under the law to have assumed the risk of the Injunction, it is obvious that many investors in fact would be caught by surprise and would be harmed if their trading were restricted or barred. Because the Proposed Options are not now trading, this risk of significant investor harm is completely and easily avoidable. The Commission should disapprove the filing so long as any legal challenges to their lawfulness remain. To approve a product in the face of a known, material and avoidable risk would expose investors to unnecessary harm and confusion and therefore would be inconsistent with the Exchange Act.

II. It Would be Misleading to Characterize the Proposed Options as Options on the ISE Max SPY Index or as Options on Any Index (SEC Issue 5).

A. *Investors Would Be Misled Because the Proposed Options Would Not Be Based on the ISE Max SPY Index.*

The Commission seeks comment on whether ISE's characterization of the Proposed Options as options on the "ISE Max SPY Index" would "have the potential to cause investor confusion." OIP, 77 FR at 38107, Issue 5. There are two respects in which this characterization would be fundamentally and incurably misleading. First, the characterization misstates the underlying interest with respect to which settlement of the Proposed Options would be determined. The most fundamental characteristic of any option is the benchmark as to which the option confers rights – *e.g.*, a Google call option gives the option holder the right to receive Google shares. ISE admits, though, that the settlement value of the Proposed Options in no way would be based on the value of its so-called ISE Max SPY Index. In particular, ISE concedes that, although the ISE Max SPY Index would be "calculated based on the traded prices of SPDR S&P 500 ETF Trust ('SPY ETF') shares," ISE "is clearly not taking the closing price of the SPY ETF and multiplying that by ten" in calculating the settlement value of the Proposed Options.[8] ISE thereby admits that the Proposed Options in no respect would be options on the ISE Max SPY Index. It accordingly would be misleading to characterize the Proposed Options as options on the "ISE Max SPY Index."

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faith transferee, who takes an asset without knowledge of the transferor's fraudulent intent, to retain enforceable rights in an otherwise fraudulently transferred asset).

[8] Letter from Michael J. Simon, Secretary and General Counsel, ISE, dated May 4, 2012 ("ISE Letter I"), p. 4.

This misleading feature of the ISE Proposal is substantive, not technical. ISE asserts that the Proposed Options would settle against a recalculated net asset value ("NAV") of the underlying trust, but that value is substantively different from the published value of the SPY ETF. The two values need never converge: while the forces of arbitrage create a band within which the difference in the values should fall, equality will occur only by chance.[9] The possibility of arbitrage does not change the fact, though, that the price at which SPY shares trade – which, when multiplied by 10 is the so-called ISE Max SPY Index – is a fundamentally different value from the SPY NAV.[10] Accordingly, if the settlement value of the Proposed Options would be based on the NAV of the fund as recalculated by ISE, it would be incorrect and misleading to characterize the Proposed Options as actually being options on the ISE Max SPY Index.[11]

In ISE Letter I, ISE tried to argue that there is nothing wrong with "utilizing a reference price to settle an index option product that differs from the value of the proposed benchmark," and ISE referenced the Special Opening Quotation ("SOQ") by which the settlement value of CBOE's a.m.-settled SPX options is determined. ISE Letter I, pp. 4-5. However, ISE proposes something radically different. The SOQ that CBOE uses as the benchmark for settling SPX options represents a modified calculation of the same interest that underlies the SPX options during their life – namely, the S&P 500 index. In contrast, ISE would use an entirely *different* underlying benchmark to calculate the settlement value of its Proposed Options. The announced benchmark during the life of the Proposed Options would be the ISE Max SPY Index, but ISE would ignore that benchmark value at settlement. The settlement value of the Proposed Options would be based on a recalculated S&P 500 index.[12] ISE claims that the settlement value of the Proposed Options instead would be based on a recalculated NAV of the SPY trust. CBOE fails to see any material difference between the two, and that is the nature of the pending state court proceeding to enforce the Injunction against the Proposed Options. Whichever position is correct, though, what matters is that neither a recalculated S&P 500 value nor a recalculated NAV of the fund are the same as the "ISE Max SPY Index." Accordingly, ISE would use one underlying benchmark during the life of the option and an entirely different underlying benchmark at settlement. In describing the Proposed Options as options on the "ISE Max SPY Index," ISE therefore would fundamentally mislead investors about the true nature of the Proposed Options.

ISE labels the Proposed Options as "Max SPY Index Options" in an effort to get around the Injunction that prohibits ISE from listing and trading options on the S&P 500. Although

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[9] *See* Declaration of Robert E. Whaley ("Whaley Declaration," a copy of which is attached as Exhibit 2), ¶10.

[10] *See* Whaley Declaration, ¶5.

[11] *See also* Whaley Declaration, ¶¶6, 11.

[12] In particular, ISE would use both the closing prices of the exact stocks that S&P has selected for the S&P 500 index and S&P's proprietary weightings of those stock prices. *See* ISE Proposal, p. 13 (the settlement value would use the "securities that comprise the S&P 500®"); *see also id.*, pp. 3-4 (component stocks would be identical to the weighting of those same stocks in the S&P 500 index); *see also id.*, p. 6 (that ISE would use those proprietary weightings and adjustments in calculating the "total value" of the S&P 500 component securities and in calculating the settlement value of its Proposed Options).

ISE's tactic only serves to confuse investors, they would be no less confused if the Proposed Options were instead labeled "ISE's recalculation of the NAV of the SPDR Trust Options," a more faithful description of the Proposed Options. Investors then would be left to ponder such questions as: are the Proposed Options cash-settled ETF options; what is the true underlying asset; and why is ISE recalculating the NAV of State Street Bank's SPDR Trust? As to the nature of the underlying asset, the Proposed Options could never be considered options on the SPDR ETF, because they purportedly would settle to a value, ISE's recalculation of the NAV of the SPDR Trust, which is an entirely different value than the traded SPDR ETF price. Further, because ISE would be making its *own* knock-off calculation of the NAV of the SPDR Trust, an activity that the sponsor of the SPDR Trust is permitted to do only pursuant to a license, ISE's activity would raise additional intellectual property issues. This would create additional risks that investors who trade in the Proposed Options would be subjected to an injunction that would impair investors' ability to trade or close out their positions in the Proposed Options. In short, regardless of their name, the Proposed Options would inevitably result in investor confusion, harm, and risk.

Perhaps for these reasons, ISE mischaracterizes the Proposed Options as options on the so-called ISE Max SPY Index. The Commission asks whether the confusion resulting from this mischaracterization could be "sufficiently mitigated" with further disclosure. OIP, 77 FR 38107, Issue 5. It cannot be, because the misleading feature of the ISE Proposal goes to the very essence of what the Proposed Options are. If an option would settle against Yahoo shares, one could not justify calling it a Google option simply because collateral disclosure explained the actual intent to use Yahoo as the settlement benchmark. Investors are entitled to assume – and will assume – that an option settles against the benchmark referenced in the name of the option. In this case, investors would assume that the Proposed Options would settle with reference to the so-called ISE Max SPY Index because that is the name of the product.[13] No amount of fine print could eliminate or cure the inherent confusion that would come from this misleading characterization of the Proposed Options, and public policy should not allow an exchange to try to do so. The ISE Proposal therefore is inconsistent with the requirements of Section 6(b)(5) of the Exchange Act and should be disapproved.

B. *It Would Be Misleading to Characterize the Proposed Benchmark as a Security Index.*

The second reason why it is misleading to characterize the Proposed Options as options on the "ISE Max SPY Index" is that this so-called index would not be a security index at all, because it would consist of only a single component security – the SPY ETF. ISE supports its claim that a security index can consist of a single reference security by relying on CBOE Rule 24.2(d), because that rule defines a Micro Narrow-Based security index as consisting of "nine or fewer component securities." ISE Letter I, p. 7. ISE apparently contends that, because one component security is arithmetically "fewer" than nine securities, Rule 24.2(d) must contemplate a security index consisting of only a single component stock.

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[13] *See* Whaley Declaration, ¶¶6, 11.

The Exchange Act, the Commission's pronouncements and ISE's own publications demonstrate that ISE is simply wrong and that a security index must consist of at least two benchmark securities. With respect to the Exchange Act, Section 3(a)(10) of the Exchange Act defines an "index" as an "index of securities." (Emphasis added.) The use of the plural demonstrates that a security index must consist of at least two underlying securities. Moreover, the Exchange Act consistently distinguishes between an index and a single security – a distinction that would be meaningless if a security index could be based on a single security. For instance, Section 3(a)(55)(A) of the Exchange Act defines the term "security future," in part, as a contract of sale for future delivery of either "a single security" or "a narrow-based security index" (known as Micro Narrow-Based security indexes in CBOE Rule 24.2(d)). Section 3(a)(55)(B) of the Exchange Act in turn defines the term "narrow-based security index" in terms almost identical to the terms of CBOE Rule 24.2(d) – *e.g.*, as, among other things, consisting of "an index" that has "9 or fewer securities." Because Section 3(a)(55)(A) recognizes a distinction between a "narrow-based security index" and a "single security," it is clear that the Exchange Act does not contemplate a "narrow-based security index" consisting of a single security.

The Exchange Act recognizes this same distinction in its treatment of securities-based swaps. Section 3(a)(68)(B)(ii) of the Exchange Act defines a "securities-based swap" as a swap that is based either on "an index that is a narrow-based security index" or on a "single security . . . , including . . . on the value thereof." Again, this distinction between a single security and a narrow-based security index would make no sense if a single security could itself be the basis of a security index. In fact, Section 3(a)(68)(B)(ii) makes clear that a mathematical calculation based on the value of a single security is not considered a narrow-based security index, because the provision defines a swap based "on the value" of a single security as a swap on a "single security," not a swap on a narrow-based security index.

The Commission's pronouncements similarly demonstrate that a security index cannot be based on a single security. For instance, the Commission's Staff Legal Bulletin No. 15 (the "Division Bulletin") repeatedly states that narrow-based indexes are composed of at least "two or more securities."[14] The Commission reached the same conclusion in its rules regarding security futures. In specifying how a Security Futures Product Exchange must report trades in security futures, the Commission imposed separate requirements for each "contract of sale for future delivery of a single security" as compared to "each contract of sale for future delivery of a narrow-based security index."[15] This distinction would be unnecessary if a single security could be the basis of a narrow-based security index.

Finally, ISE itself has acknowledged that a security index must be composed of at least two underlying securities. On its website, ISE answers the question, "What is an Index?"[16] ISE

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[14] Listing Standards for Trading Security Futures Products (September 5, 2001) ("Division Bulletin"), *available at* http://www.sec.gov/interps/legal/mrslb15.htm, §§III.A, IV.A and IV.B. .

[15] *See* 17 CFR 240.6a-4(c)(2).

[16] Index Options: What is an Index, *available at* http://www.ise.com/WebForm/viewPage.aspx?categoryId=437#WhatisanIndex?

candidly responds that a "stock index is a compilation of *several* stock prices into a single number" and that this number involves an "average" of those prices. *Id.* (emphasis added). A purported index based on a single security necessarily cannot involve any type of "average" of "several" stock prices and therefore falls outside even ISE's conception of a security index.[17]

The Exchange Act, the Commission and even ISE all distinguish between security indexes and a single security and all recognize that a security index must consist of at least two securities. Put in context, CBOE Rule 24.2(d) does not suggest differently. By its express terms, Rule 24.2(d) applies only to an underlying benchmark that itself "is a security index." The "9 or fewer" test in that rule only applies to a benchmark that already has qualified as a security index. ISE therefore cannot logically use the "9 or fewer" test to answer the threshold question of whether the underlying benchmark constitutes a "security index" in the first place.

In arguing that security index options may be traded on a security index consisting of a single component security, ISE's only other precedent is CBOE's now-delisted interest rate options contracts, such as the TNX option. The TNX option was based on a reference value calculated as a multiple of the spot yield of the most recently auctioned 10-year Treasury note. The term "index" was used in referring to the reference value for the TNX in a manner distinct from the meaning of a "security index." In connection with TNX, the term meant a number or a reference point, in the same sense that the word "index" is used in the term "consumer price index."[18] TNX options were not security index options, but instead were interest rate options based on interest rate values that were "indexed" to make the options contracts a suitable size. TNX options were regulated as interest rate options and were described for all purposes as interest rate options. TNX options have no relevance to the issue for which ISE attempts to invoke them – namely, whether a *security* index may consist of a single component security.

For the foregoing reasons, it would be misleading for ISE to characterize the Proposed Options as a kind of index option, much less as a broad-based index option. ISE should not be allowed to attract customers by misleadingly appealing to the popularity of index options and the confidence that investors have in indexes and index options. Further disclosure would not solve the problem, because the characterization of the Proposed Options as "index" options is just not true, and no amount of disclosure can undo the harm of a characterization that is simply false. The ISE Proposal therefore is inconsistent with the requirements of Section 6(b)(5) of the Exchange Act and should be disapproved.

It is important to recognize that the ISE Proposal represents an attempt to poke the proverbial camel's nose under the tent. Allowing options to trade on a security index consisting

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[17] This definition is consistent with the Options Disclosure Document, which defines a security "index" as a measure of the prices of a *group* of securities." Characteristics and Risks of Standardized Options (February 1994), p.23, *emphasis added.*

[18] In discussing index-linked securities, the ODD underscores the distinct meaning of "index" in the context of a security index. The ODD describes index-linked securities as providing a cash return based on the performance of a "reference asset." The ODD then specifically notes that the term "index" in the context of an "index-linked security" is synonymous with the term "reference asset" and has a "broader meaning" than that set forth in the ODD's description of "security indexes." *See* May 2010 Supplement to the Options Disclosure Document, pp. 1-2.

of a single component would implicate potentially far-reaching regulatory considerations under the Exchange Act. If the concept of a "security index option" is that elastic, then options on a single equity stock could just as easily be traded as a security index option, through the fiction of creating a reference point to that single stock's prices. Cash-settled options on a single stock have never before been contemplated, and should not be permitted now – at least without deep regulatory examination of the implications of that development.

III. ISE Would Confuse Investors By Disseminating "Index" Values Having No Relation to the Calculation of the Settlement Value of the Proposed Options (SEC Issues 3-4).

The Commission seeks comment on whether investors would be confused by the "differences between the calculation of the settlement value of the proposed options and the value of the ISE Max SPY Index itself." OIP, 77 FR 38106, Issue 3. The answer is "yes," for many of the same reasons set forth in Section II.A above. In particular, it is inherently confusing to tell investors in the ISE Proposal that the Proposed Options would be options "on the ISE Max SPY™ Index"[19] and then to base the settlement value of those options not on the values of that "index," but rather on a completely different benchmark. Investors are even more likely to be confused by this bait and switch because ISE will inundate them with values for that "index" "every 15 seconds during the Exchange's regular trading hours."[20] ISE's every action therefore will communicate to investors that the "ISE Max SPY Index" is significant, when that "index" actually will be utterly meaningless in determining the rights and obligations of investors who trade in the Proposed Options and in making logical decisions about the value of those options.[21]

The Commission also seeks comment on whether ISE has taken steps "sufficient to mitigate" this confusion. OIP, p. 25-26, Issue 4. For the reasons set forth in Section II.A, this confusion is too fundamental to be cured by additional disclosure. The confusion goes to the heart of what the Proposed Options are. ISE plans to firmly fix in the mind of investors that the Proposed Options are options on the "ISE Max SPY Index" – both by the name it gives to the options and by the data about that "index" with which ISE will flood investors. ISE cannot cement such a fundamental misunderstanding about the nature of the Proposed Options and then claim that investors should have pored over detailed disclosure to discover the truth.

IV. ISE Has Failed to Make Sufficient Disclosure About How It Will Calculate the Settlement Value of the Proposed Options (SEC Issue 2).

The Commission also seeks comment on whether ISE's additional disclosure about "how it intends to calculate the settlement value" for the Proposed Options is sufficient or whether ISE instead "should provide additional clarity in the filing regarding the calculation methodology for the settlement value." OIP, 77 FR 38106-107, Issue 2. As an initial matter, any disclosure about how ISE would calculate the settlement value of the Proposed Options should be in the

[19] *See* ISE Proposal, 77 FR 16883.

[20] *See* ISE Proposal, 77 FR 16884.

[21] *See* Whaley Declaration, ¶¶6,7 and 11.

filing itself. ISE has reluctantly dribbled out selected information on this subject in the course of responding to comment letters. However, the ISE Proposal should rise or fall on what is in its official rule change filing or in formal amendments to that filing, not on what might be extracted from the argumentation and rhetoric contained in ISE's responses to comment letters. Responses to comment letters do not appear in the Federal Register and therefore do not provide adequate notice to market participants about the nature of the Proposed Options. The Commission has emphasized that it is particularly important that a rule change filing contain the actual methodology for calculating the settlement value of an option, because the "calculation of the settlement value for the new derivative securities product should be *clear, fixed and objective*."[22] So too should the settlement value methodology for the Proposed Options be set out in the actual rule change filing in a "clear, fixed and objective" way – so that market participants have clarity about what ISE is proposing in a single document (instead of that information being buried in multiple comment letters), so that the Commission knows precisely what it is being asked to approve, and so that there is a clear record of the action the Commission will take.

In any event, ISE's comment letters leave fundamental questions about how ISE would calculate the NAV of the SPY ETF. ISE represents it would use the data that the SPY ETF administrator makes available to National Securities Clearing Corporation ("NSCC") and that NSCC then makes available to market participants "soon after" the close of trading on the day the settlement value is reported to OCC.[23] ISE acknowledges that the settlement value of the Proposed Options must be transmitted to OCC "generally before 6PM ET."[24] However, CBOE is informed by NSCC that the "Domestic Portfolio Composition File," which is the data that would include information about the net cash for the SPY ETF, is not disseminated until approximately 8 p.m. ET. Accordingly, the information on which ISE purportedly would rely to compute the NAV of the SPY ETF would not be available until hours *after* ISE's admitted deadline, and any information to which ISE would have access at 6 p.m. ET necessarily would be stale information that is at least one day old. This contradiction casts grave doubts on ISE's claims that the settlement value of the Proposed Options would – or could – be based on the NAV of the SPY ETF – at least as ISE has represented that the NAV would be calculated. Investors and the Commission should not have to guess about what ISE would do. Public investors are entitled to a clear and internally consistent description of the source – and any staleness – of the required data.

Moreover, ISE's description of "how it intends to calculate the settlement value" for the Proposed Options does not adequately inform investors about this core feature of those options. ISE did not offer *any* description of the settlement methodology until its *second* comment letter after its rule filing – having failed to do so in either the ISE Proposal, the amendment to that proposal or ISE's first comment letter. In its second comment letter, ISE provided a formula for

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[22] *See* Securities Exchange Act Release No. 40761 (Dec. 8, 1998), 63 FR 70952, 70960 (Dec. 22, 1998) (amending rule filing requirements for self-regulatory organizations regarding new derivative securities products and requiring settlement valuations methodology even in filings for derivatives products that become effective on filing).

[23] ISE Letter II, pp. 3-4.

[24] ISE Letter II, p. 4.

the settlement value and stated that the formula is "the same standard method that is used industry-wide" for ETFs.[25] In fact, ISE's description of its settlement methodology is confused, incomplete and internally inconsistent.

For instance, the left side of ISE's NAV equation employs a "t" subscript to reflect that it represents the NAV on day "t," but the right side of the equation employs no "t" subscript in either the numerator or denominator.[26] It therefore is not clear as of what time period the elements on that side of the equation would be calculated. There also is an ambiguity regarding the treatment of trust fees in that equation. The element of the equation dealing with fees divides the annual fee by 365, meaning that the formula would include fees only to the extent they accrued on the day of settlement.[27] However, the text of ISE's comment letter recites that the net cash amount includes "accrued dividends of the portfolio securities since the fund's last distribution minus the accrued fees," which implies that the fees factored into the NAV would include all fees that had accrued "since the fund's last distribution."[28] ISE then adds vagueness to internal inconsistency by stating that the accrued fees that would be factored into its NAV calculations are "*essentially* the annual management fees prorated per day."[29] Investors and the Commission are entitled to know *exactly* what the elements of ISE's calculation would be, not what they *essentially* would be. Many market participants, including public "retail" investors, would be confused by the vague, incomplete and internally inconsistent information that ISE has given. On a final note, these problems are yet additional examples of how ISE has not thought through its proposal and how it would lead to investor confusion, harm, and risk. The ISE Proposal fails to satisfy the requirements of the Exchange Act and should be disapproved.

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For these reasons, CBOE continues strongly to urge the Commission to disapprove the ISE Proposal. That proposal exposes investors and the market to unnecessary risk and harm and would mislead investors about the nature and value of the Proposed Options. Approval of the Proposed Options therefore would be inconsistent with the Exchange Act mandate to protect investors.

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[25] ISE Letter II, pp. 2-3.

[26] ISE's equation is as follows: $NAV_{SPY(t)} = \frac{\left[\sum_{i=1}^{n} P_{(t)} \times S_{(t)} + Cash\right] \times \left[1 - \frac{Fee}{365}\right]}{\text{Shares Outstanding}}$. *See* ISE Letter II, pp. 2-3

[27] This is expressed in the following element of the formula: $\left[1 - \frac{Fee}{365}\right]$. *See* ISE Letter II, pp. 3.

[28] *See* ISE Letter II, p. 3.

[29] *See* ISE Letter II, p. 3 (emphasis added).

CBOE appreciates the opportunity to provide these comments. Should you require any further information, please contact the undersigned at (312) 786-7088 or Jenny Klebes-Golding, Senior Attorney, at (312) 786-7466.

Sincerely,

Edward T. Tilly
President and Chief Operating Officer
Chicago Board Options Exchange, Incorporated

cc: Robert Cook, Director, SEC Division of Trading and Markets
James Burns, Deputy Director, SEC Division of Trading and Markets
Heather Seidel, Associate Director, SEC Division of Trading and Markets
Richard Holley, Assistant Director, SEC Division of Trading and Markets
John Roeser, Assistant Director, SEC Division of Trading and Markets
Victoria Crane, Assistant Director, SEC Division of Trading and Markets

April 19, 1989 Supplement to Index Participations Disclosure Document

The following supplements material in the April 14, 1989 edition of INDEX PARTICIPATIONS *under the caption "Special Risks of IPs—Other Risks":*

By orders dated April 11, 1989 (the "Approval Orders"), the Securities and Exchange Commission (the "SEC") approved the rules of the three exchanges named on the inside front cover of this booklet and the rules of OCC applicable to trading in, and the issuance, clearance and exercise of, IPs. In comment letters filed in connection with the SEC's approval procedures, the Board of Trade of the City of Chicago (the "CBT"), the Chicago Mercantile Exchange (the "CME") and the Commodity Futures Trading Commission (the "CFTC") each expressed its view that the SEC lacks jurisdiction to authorize trading in IPs on the grounds that an IP is not a "security" as defined in the Securities Exchange Act of 1934 (the "1934 Act"), but is instead a "futures contract" within the exclusive jurisdiction of the CFTC pursuant to the Commodity Exchange Act (the "CEA") and therefore can be traded lawfully only on a contract market designated by the CFTC pursuant to the CEA.

In issuing the Approval Orders, the SEC determined that an IP is a "security" within the meaning of the 1934 Act, and not a futures contract, and that exchange trading in IPs is therefore subject to the jurisdiction of the SEC. The CME and the CBT have filed petitions in the United States Court of Appeals for the Seventh Circuit for review of the Approval Orders. The petitions assert that the Approval Orders must be set aside on the grounds that (1) the SEC lacked jurisdiction to approve trading in, and the issuance, clearance and exercise of, IPs because IPs are not "securities" under the federal securities laws, (2) the CFTC has exclusive jurisdiction over IPs because IPs are futures contracts under the CEA, and (3) neither the CFTC nor the SEC has authority to allow IPs to be settled by actual delivery of the underlying stocks.

In comment letters filed with the SEC in the approval proceedings by the Investment Company Institute (the "ICI") and its counsel, the ICI expressed the view that the IPs rules of the exchanges and OCC involve the unlawful creation and operation of unregistered investment companies in violation of the Investment Company Act of 1940 (the "ICA"). The SEC determined in the Approval Orders that IPs are not subject to the ICA. The ICI has notified the SEC of its intention to seek judicial review of the Approval Orders.

Applications for a stay of the Approval Orders filed by the CME, the CBT and the ICI are pending at the date of this supplement. If a stay of either Approval Order pending judicial review is granted by the SEC or a court before trading of IPs has commenced, then such trading will not be commenced until the stay is terminated. If a stay is not granted or is terminated, some or all of the markets may commence trading in IPs, notwithstanding the pendency of the judicial review. If either Approval Order is set aside or temporary injunctive relief or a stay is granted after trading in IPs has commenced, trading in IPs might be ordered to be promptly terminated in whole or in part, or all further opening transactions in IPs might be enjoined, and the enforcement of performance of the terms of the IPs might be restricted or even prohibited. The actions that a court might take and the legal and market consequences of such actions cannot be predicted with certainty, and there may be additional risks to purchasers and writers of IPs resulting from such actions.

EXHIBIT 2

DECLARATION OF ROBERT E. WHALEY

I, the undersigned, Robert E. Whaley, declare as follows:

1. I am currently the Valere Blair Potter Professor of Management and Co-Director of the Financial Markets Research Center at the Owen Graduate School of Management, Vanderbilt University in Nashville, Tennessee.

2. I received my Ph.D. from the University of Toronto in 1978, my M.B.A. from the University of Toronto in 1976, and my B.Comm. from the University of Alberta in 1975.

3. My academic work has focused on a number of areas including designing market indexes, issues related to market operation and contract design, indexes and index derivatives products, index option valuation, price discovery in the index futures and options markets, and the dynamics of index option price-implied volatility. A full list of my publications is provided in the appendix to this declaration.

    a. I have designed several market indexes. In 1992, I was commissioned by the CBOE to develop a stock market volatility index based on its S&P 100 index options. The result of the work was the 1993 launch of CBOE's Market Volatility Index (VIX). See Whaley (*JD* 1993) and Fleming, Ostdiek, and Whaley (*JFM* 1995). In 2001-2, I was commissioned by the CBOE to develop a buy-write index based on its S&P 500 index options. The result of the work was the 2002 launch of CBOE's Buy-Write Index (BXM). See Whaley (*JD* 2002). Most recently, NASDAQ OMX commissioned Jacob Sagi and me to develop a suite of relative performance indexes. Options on selected "Alpha Indexes" were launched in 2011. See Sagi and Whaley (*FAJ* 2011).

    b. I have analyzed issues related to market operation and contract design, with particular emphasis on index products. In 1986, Hans Stoll and I were commissioned by the major U.S. options exchanges and the National Association of Securities Dealers to analyze trading in the stock and stock index derivatives markets during the "triple-witching hour," when index options, index futures, and stock option markets expired simultaneously. See Stoll and Whaley (*FAJ* 1987 and *FAJ* 1991). I performed similar expiration day analyses of the Australian Share Price Index futures contracts (see Stoll and Whaley (*AJM* 1997)) and of the Hang Seng Index derivative contracts (see Bollen and Whaley (*PBFJ* 1999) for the Sydney Futures Exchange in 1996 and for the Hong Kong Futures Exchange in 1998, respectively. In 1990, the major U.S. futures exchanges commissioned Tom Smith and me to analyze the effects of dual trading in the futures markets. The empirical work focused on the "top-step rule," which had been implemented in the S&P 500 futures market. See Smith and Whaley (*JLE* 1994 and *JFM* 1994). In 2009, Hans Stoll and I were commissioned by Gresham Investment Management LLC to examine the price and volume effects in commodity futures markets

resulting from commodity index investing. See Stoll and Whaley (*JAI* 2011 and *JAF* 2010).

c. I have derived models and techniques for valuing index option contracts. In Whaley (*JF* 1986), I developed a model for valuing American-style options on futures and evaluated its performance using S&P 500 index futures option prices. In Barone-Adesi and Whaley (*JF* 1987), the model was generalized to handle other underlying assets including stock indexes and foreign currencies. Fleming and Whaley (*JF* 1994) developed a model for valuing the wild-card option embedded in the S&P 100 index option contract. Gray and Smith (*JD* 1997) derived a model for valuing bear market warrants with a periodic reset, and Sagi and Whaley (*FAJ* 2011) derived a model for valuing alpha index options. Other papers focusing on index option valuation issues are Harvey and Whaley (*JF* 1991 and *JFM* 1992) and Gray and Whaley (*AJM* 1999).

d. I have analyzed price discovery in the index futures and option markets. Among other findings, unexpected market information appears to get impounded in index futures first, and is then followed by price changes in the stock market when index arbitragers step in. See Fleming, Ostdiek and Whaley (*JFM* 1996), Miller, Muthuswamy and Whaley (*JF* 1994), Kleidon and Whaley (*JF* 1992), and Stoll and Whaley (*JFQA* 1990).

e. I have analyzed the levels and dynamics of index option price-implied volatility. Index option price-implied volatility measures such as VIX were shown to be affected by the institutional demand for portfolio insurance (i.e., S&P 500 index puts). See Bollen and Whaley (*JF* 2004), Dumas, Fleming and Whaley (*JF* 1998), and Harvey and Whaley (*JFE* 1982).

4. CBOE has engaged me to review the International Securities Exchange's (ISE's) proposal to list options on the ISE Max SPY™ Index ("Max SPY Index") and to offer my views about the structure of the product. After reviewing the materials, I conclude that Max SPY Index options (a) will cause significant investor confusion, and (b) have the potential of damaging market integrity.

5. In my view, the most serious flaw in the proposed contract design is the way that the settlement value of the options will be calculated compared to what they purport to be. Throughout the option's life, the Max SPY Index on which the options supposedly are based is defined and disseminated as ten times the prevailing market price of SPY shares (i.e., "10 x SPY"). Then, when it is time to settle the option after the close on expiration day, ISE states that it would determine the settlement value of the option based on the net asset value (NAV) of the SPDR® S&P500® Trust ("SPDR Trust"). These two values are separate and distinct. SPY is a security, the price of a single share of the SPDR Trust. The NAV per share is a weighted-average of the portfolio of the stocks held in the SPDR Trust. The difference between the market price of the fund and its NAV is often referred to as the premium (i.e., market price higher than NAV) or the discount (i.e., market price below NAV) of the fund and has been the subject of academic and practitioner study over many decades.

6. In the context of Max SPY Index options, what is even more important than the size of the premium or discount is how the options are being portrayed. The index underlying the proposed options is labeled the "Max SPY Index." Presumably the term "Max" refers to the fact that the price of the SPY shares is scaled upward by a factor of 10, and "SPY" refers to the share price of the SPDR Trust whose ticker symbol is SPY. ISE proposes to calculate and disseminate the value 10 x SPY at fifteen-second intervals throughout the life of the option. Based on the name of the proposed options and the fact that the "index" would be calculated as 10 x SPY and disseminated on a real-time basis for investor convenience, I believe that investors would legitimately assume that the options are written on ten times the price per share of SPY. But, they are not.

7. The value of the option in no way depends on the real-time price level 10 x SPY. That price level is meaningless from a valuation standpoint. The proposed "Max SPY Index" option contract is European-style, and, therefore, depends only on the settlement value. That is, ISE states that, at one instant in time hours after the market has closed on option expiration day, the settlement value would be based on the NAV per share of the SPDR Trust.

8. To illustrate the confusion that would arise from this switch, consider the SPY price and the NAV of the SPDR Trust on September 19, 2008. According to the proposed terms of the Max SPY Index options, this date would have been an expiration day for the Max SPY Index options had they been listed at the time. At the close of trading on this day, the SPY share price was 124.12.[1] This means that the Max SPY Index would have closed at a level of 1,241.20. Then, after the close, the settlement value of the Max SPY Index would have been calculated as the NAV per share of the SPDR Trust, 125.337823,[2] assuming that ISE's calculation would have matched that of the sponsor of the Trust. Thus, the settlement value used to calculate the cash settlement proceeds of the expiring Max SPY Index option series would have been 1,253.40. Now, consider an investor holding an expiring Max SPY Index put option with a strike price of 1250. At the market close, the put option holder would be expecting exercise proceeds of about $880 per contract. Based on the settlement value, however, the put option holder would receive nothing, which would come as an unwelcome surprise.

9. The direction of the deviation between the SPY price and the NAV per share of the SPDR Trust (i.e., whether the SPDR Trust is selling at a premium or a discount) is unpredictable. While, in the above illustration, the closing price of SPY was above the end-of-day NAV, the reverse can be true also. At the close on October 13, 2008, for example, SPY closed at 101.35 and the NAV of the fund was 100.347268. Had this been an expiration day, an investor holding an expiring call option with a strike price of 1000 would have been anticipating a cash settlement of $1,350 but instead would have received $350.

[1] Source: http://finance.yahoo.com.
[2] Source: https://www.spdrs.com/product/fund.seam?ticker=spy.

10. The SPY price and the NAV per share of the SPDR Trust need never converge: while the forces of arbitrage create a band within which the difference in the values should fall, equality will occur only by chance. While, on average, these deviations may be centered on zero through time, all that is needed is a *single* large deviation at option settlement to undermine investor confidence and attract the attention of an increasingly critical financial press, thereby damaging market integrity.

11. In conclusion, labeling the proposed options Max SPY Index options and reporting the value 10 x SPY on a real-time basis would create the mistaken impression that the option values depend on the quantity 10 x SPY. They would not. They would depend only on the calculation that ISE would purport to do for the NAV per share of the SPDR Trust at settlement, hours after the market has closed. In my view, this difference would cause significant investor confusion and has the potential of damaging market integrity.

Date: August 10, 2012

Robert E. Whaley

APPENDIX
Vita of Robert E. Whaley

ROBERT E. WHALEY

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Phone: 615-343-7747
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Fax: 615-376-8879
E-mail: whaley@vanderbilt.edu

Home Address:

30 Park Meadows
Nashville, TN 37215
Phone: 615-376-1138

Current Positions:

Valere Blair Potter Professor of Management and Co-Director, Financial Markets Research Center, The Owen Graduate School of Management, Vanderbilt University

Education:

Ph.D., University of Toronto, December 1978
M.B.A., University of Toronto, May 1976
B.Com., University of Alberta, May 1975

Awards, Distinctions, and Research Grants:

Vice Chairman, Board of Directors, BOX Options Exchange LLC, 2012

Rang opening bell, NASDAQ OMX for Alpha Index Options launch, April 19, 2011

Judge, Standard & Poor's SPIVA Research Paper Award, 2011

11th Annual Bernstein Fabozzi/Jacobs Levy Award for Best Article published in *Journal of Portfolio Management* during the volume year 2008-2009

Gresham Investment Management LLC Research Grant 2009

OGSM Faculty Research Impact Award 2007

Foundation for Managed Derivatives Research Grant, 2006-2007

Bernstein Fabozzi/Jacobs Levy Award for Outstanding Article published in *Journal of PortfolioManagement* during the volume year 1999-2000

International Advisory Board member, University Centre for Financial Engineering,

National University of Singapore, 1999-present

E. Yetton Award for Best Paper in *Australian Journal of Management*, 1997

EOE Prize, Institute for Quantitative Investment Research–Europe, 1995

Director, American Finance Association, 1995-1999

Director, Western Finance Association, 1994-1997

FSB Quasi Endowment Income Fund, 1993

Earl M. Combs, Jr. Award, 1993

Business Associates' Fund Research Grant, 1992

CBOT Award for Best Paper on Futures, Western Finance Association, 1992

NCNB Faculty Award Winner, 1991

Isle Maligne Fund Research Grant, 1991
NCNB Faculty Award Nominee, 1990
Business Associates' Fund Research Grant, 1990
CBOE/AMEX Research Grant, 1989-1990
NCNB Faculty Award Nominee, 1989
CSI Award for Best Paper in Investments, Northern Finance Association, 1989
American Finance Association Nominating Committee, 1989
Business Associates' Fund Research Grant, 1989
Richard and Hinda Rosenthal Foundation Award, 1989
Research Foundation Grant, The Institute of Chartered Financial Analysts, 1988-1989
NCNB Faculty Award Nominee, 1988
Unisys Fund Research Grant, 1988
Graham and Dodd Scroll, 1987
CBOE/CBOT/CME Research Grant, 1987
Unisys Fund Research Grant, 1987
Graham and Dodd Scroll, 1986
J.D. Muir Research Fund Grant, 1985
Finance Research Foundation of Canada Grant, 1984-1985
American Enterprise Institute for Public Policy Grant, 1983-1985
Small Business Administration Grant, 1983-1984
Dean's Fund for Faculty Research Grant, 1983
Vanderbilt University Research Council Grant, 1982-1984
Dean's Fund for Faculty Research Grant, 1982
Institute for Quantitative Research in Finance Grant, 1981-1982
Dean's Fund for Faculty Research Grant, 1981
Dean's Fund for Faculty Research Grant, 1980
Vanderbilt University Research Council Grant, 1979-1980
Dean's Fund for Faculty Research Grant, 1979
Social Sciences and Humanities Research Council of Canada Doctoral Fellowship, 1978
Canada Council Doctoral Fellowship, 1977-1978
Wood Gundy Doctoral Fellowship, 1976-1977
University of Toronto Masters' Fellowship, 1975-1976

Academic and Other Professional Work Experience:

Vanderbilt University, Owen Graduate School of Management, Nashville, TN

2006-present: Valere Blair Potter Professor of Management (finance) and Co-Director of the Financial Markets Research Center

- Taught daytime MBA course in:
  - Derivatives Markets
  - Bond Markets (formerly Fixed Income)
  - Equities Markets
- School: Committee service includes:
  - MSF Program Advisory Committee; 2008-present
  - Building Task Force 2007-2008 (Chairman); 2008-2009

- Research Committee 2007-2009 (Chairman); 2009-2010
- Curriculum Committee 2006-2007; 2007-2008 (Chairman)
- Distance Education Committee 2006-2008 (Chairman)
- Entertainment/Digital Media MBA Evaluation Committee 2006-2007
- Accounting Recruiting Committee 2006-2007
- Finance Recruiting Committee 2006-2012 (Chairman)
- Senior Marketing Recruiting Committee 2006-2007
- Executive Committee 2006-2008

- University: Committee service includes:
  - Promotion and Tenure Review Committee 2011-2014

Duke University, Fuqua School of Business, Durham, NC

1993-2006: T. Austin Finch Foundation Professor of Business Administration
1989-1993: Professor of Finance with tenure
1986-1989: Associate Professor of Finance with tenure

- Served as Area Coordinator, Finance, 1986-1992, 1993-1994.
- Taught daytime, evening, and weekend MBA courses in:
  - Financial Management
  - Investment Management
  - Derivatives
  - Advanced Derivatives
  - Fixed Income Securities and Risk Management
- Supervised independent study programs in finance.
- Supervised Finance Ph.D. program, 1986-1988.
- School: Committee service includes:
  - Accounting Recruiting
  - Curriculum
  - Distinguished Professors Committee (Chairman)
  - International Business
  - L. Palmer Fox Chair Accounting Search (Chairman)
  - Strategy
  - Measurement Task Force
  - Curriculum Task Force
  - Various ad hoc appointment, promotion, and tenure committees
- University: Committee service includes:
  - Advisory Committee on Distinguished Professorships 1993-1998 (Chairman 1997-1998), 2005-6.
  - Appointments, Promotion, and Tenure Advisory Committee 1999-2002
  - University Priorities Committee 2003-2006
  - Budget and Finance Subcommittee 2003-2006
  - Dean Search Committee
  - Faculty Council

University of Chicago, Graduate School of Business, Chicago, IL

1997: Visiting Professor of Finance

1992: Visiting Professor of Finance

1985-1986: Visiting Associate Professor of Finance

- Taught MBA courses in Corporation Finance, Investments, and Financial Instruments.

University of Alberta, School of Business, Edmonton, Alberta, Canada

1985-1986: Associate Professor of Finance (on leave)

1984-1985: Associate Professor with tenure and Director, Institute for Financial Research

- Taught MBA courses in Managerial Finance and Risk Management; and undergraduate courses in Business Finance and Risk Management.

Vanderbilt University, Owen Graduate School of Management, Nashville, TN

1983-1984: Associate Professor of Management with tenure

1982-1983: Assistant Professor (on leave)

1978-1982: Assistant Professor

- Taught MBA courses in Managerial Finance, Securities Analysis, Capital Market Theory, and Forecasting; Executive MBA courses in Managerial Finance and Investments; undergraduate course in Business Finance; and independent study and integrative applied project programs in Finance and Quantitative Methods.
- School: Served on Admissions, Accounting Search, Environment Search, Finance Search, Statistics Search, New Building, Instruction, and Computer Service Committees.
- University: Served on Graduate Student Appellate Review Board.

GNP Commodities, Inc., Chicago, IL

1982-1983: Vice President, GNP Consulting

- Designed and developed computer software for valuing futures, futures option, and option contracts and analyzing trading strategies.

Publications: Books

Robert E. Whaley, 2006, *Derivatives: Markets, Valuation, Risk Management*, Hoboken, New Jersey: John Wiley & Sons, Inc.

Hans R. Stoll and Robert E. Whaley, 1993, *Futures and Options: Theory and Applications* (with H.R. Stoll), Cincinnati, OH: South-Western Publishing Co.

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Hans R. Stoll and Robert E. Whaley, 1990, *Stock Market Structure, Volatility, and Volume*, The Research Foundation of The Institute of Chartered Financial Analysts.

Richard Brealey, Stewart Myers, Gordon A. Sick, and Robert E. Whaley, 1986, *Principles of Corporate Finance: Canadian Edition*, Toronto, Ontario: McGraw-Hill Ryerson Limited.

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Stephen Gray and Robert E. Whaley, 1997, Valuing S&P 500 bear market warrants with a periodic reset, *Journal of Derivatives* 5, 1 (Fall), 99-106.

Hans R. Stoll and Robert E. Whaley, 1997, Expiration-day effects of the All Ordinaries Share Price Index futures: Empirical evidence and alternative settlement procedures, *Australian Journal of Management* 22 (December), 139-174. Winner of 1998 E. Yetton Award for Best Paper in *Australian Journal of Management* during 1997.

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Robert E. Whaley, 1996, Valuing spread options, *Energy in the News* (Summer), 42-45.

Jeff Fleming, Barbara Ostdiek and Robert E. Whaley, 1996, Trading costs and the relative rates of price discovery in the stock, futures and options Markets, *Journal of Futures Markets* 16 (June), 353-387.

Jeff Fleming, Barbara Ostdiek and Robert E. Whaley, 1995, Predicting stock market volatility: A new measure, *Journal of Futures Markets* 15 (May), 265-302. Also in the Chicago Board of Trade's *Research Symposium Proceedings*, December 1994, 155-200.

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Jeff Fleming and Robert E. Whaley, 1994, The value of wildcard options, *Journal of Finance* 49 (March), 215-236.

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Robert E. Whaley, 1993, Intra-day price observations: On computing portfolio returns, *Review of Futures Markets* 12, 175-190.

Robert E. Whaley, 1993, Derivatives on market volatility: Hedging tools long overdue, *Journal of Derivatives* 1 (Fall), 71-84. Also in *Volatility: New Techniques for Pricing Derivatives and Managing Financial Portfolios*, Robert A. Jarrow (Editor), RISK Books, London, England, 1998.

Allan W. Kleidon and Robert E. Whaley, 1992, One market? Stocks, futures and options during October 1987, *Journal of Finance* 47 (July), 851-877.

Campbell R. Harvey and Robert E. Whaley, 1992, Market volatility prediction and the efficiency of the S&P 100 index option market, *Journal of Financial Economics* 30 (February), 33-73.

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Hans R. Stoll and Robert E. Whaley, 1990, Stock market structure and volatility, *Review of Financial Studies* 3 (Spring), 37-71.

Jens Stephen and Robert E. Whaley, 1990, Intraday price change and trading volume relations in the stock and stock option markets, *Journal of Finance* 45(March), 191-220.

Hans R. Stoll and Robert E. Whaley, 1990, Program trading and individual stock returns: Ingredients of the triple witching brew, *Journal of Business* 63 (January), S165-S192.

Hans R. Stoll and Robert E. Whaley, 1988, Futures and options on stock indexes: Economic purpose, arbitrage, and market structure, *Review of Futures Markets* 7, 224-248.

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Hans R. Stoll and Robert E. Whaley, 1988, Stock market volatility and index futures: Message versus messenger, *Journal of Portfolio Management* 14 (Winter), 20-22.

Giovanni Barone-Adesi and Robert E. Whaley, 1987, Efficient analytic approximation of American option values, *Journal of Finance* 42 (June), 301-320. Also in *Selected Writings on Futures Markets: The Interrelations Between Futures, Option and Futures Option Markets*, Robert E. Whaley (Editor), The Chicago Board of Trade, Chicago, IL, 1992, in *Currency Derivatives: Pricing Theory, Exotic Options, and Hedging Applications*, D. DeRosa (Editor),

John Wiley and Sons (1998), and in *The International Library of Critical Readings in Financial Economics: Options Markets* G.M. Constantinides and A.G. Malliaris (Editors), Edward Elgar Publishing Limited, 2001.

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Hans R. Stoll and Robert E. Whaley, 1986, Program trading and the stock market, *Financial Analysts Journal* 42 (November/December), 8.

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Hans R. Stoll and Robert E. Whaley, 1986, New option instruments: Arbitrageable linkages and valuation, *Advances in Futures and Options Research* 1(A), 25-62.

Robert E. Whaley, 1986, On valuing American futures options, *Financial Analysts Journal* 42 (May/June), 49-59. Also in *CFA Readings in Derivative Securities*, M.A. Berry and K.F. Sherrerd (Editors), The Institute for Chartered Financial Analysts (1988), 194-204, and in *Currency Derivatives: Pricing Theory, Exotic Options, and Hedging Applications*, D. DeRosa (Editor), John Wiley and Sons (1998). Winner of 1986 Graham and Dodd Scroll for Excellence in Financial Writing.

Robert E. Whaley, 1986, Valuation of American futures options: Theory and empirical tests, *Journal of Finance* 41 (March), 127-150. Also in *The Handbook of Financial Engineering: New Financial Product Innovations, Applications, and Analyses*, Clifford W. Smith Jr. and Charles W. Smithson (Editors), Harper Business, A Division of Harper & Row, Publishers, New York, 1990; in *The Financial Derivatives Reader*, Robert W. Kolb (Editor), Kolb Publishing Company, Miami, FL, 1992; and in *Selected Writings on Futures Markets: The Interrelations Between Futures, Option and Futures Option Markets*, Robert E. Whaley (Editor), The Chicago Board of Trade, Chicago, IL, 1992. Abstract appears in *Journal of Economic Literature* 24 (September 1986), 1606.

Hans R. Stoll and Robert E. Whaley, 1985, The new options markets. In *Futures Markets: Their Economic Role*, Anne Peck (editor), Washington, D.C.: American Enterprise Institute, 205-289.

Hans R. Stoll and Robert E. Whaley, 1984, New options instruments: Arbitrageable linkages and valuation: An extended abstract, *Proceedings of the Money, Banking and Insurance Symposium* (December), 1067-1076.

Robert E. Whaley, 1984, Equity futures contracts: A new stock portfolio management tool, *Advantage* 6 (April), 119-120.

Hans R. Stoll and Robert E. Whaley, 1983, Transaction costs and the small firm effect, *Journal of Financial Economics* 12 (June), 57-79.

Robert E. Whaley and Joseph K. Cheung, 1982, Anticipation of quarterly earnings announcements: A test of option market efficiency, *Journal of Accounting and Economics* 4 (October), 57-83. Lead article.

Robert E. Whaley, 1982, Valuation of American call options on dividend-paying stocks: Empirical tests, *Journal of Financial Economics* 10 (March), 29-58. Also in *Empirical Research in Capital Markets,* G.William Schwert and Clifford W. Smith Jr. (Editors), McGraw-Hill Book Company (1991).

Robert E. Whaley, 1981, On the valuation of American call options on stocks with known dividends, *Journal of Financial Economics* 9 (June), 207-211. Also in *CFA Readings in Derivative Securities*, M.A. Berry and K.F. Sherrerd (Editors), The Institute for Chartered Financial Analysts (1988), 127-131; and in *Selected Writings on Futures Markets: The Interrelations Between Futures, Option and Futures Option Markets*, Robert E. Whaley (Editor), The Chicago Board of Trade, Chicago, IL, 1992.

Dwight Grant and Robert E. Whaley, 1978, Transaction costs on government bonds: A re-specification, *Journal of Business* 51 (January), 57-64.

Publications: Proceedings

Robert E. Whaley, 1998, Commentary on hedging vega risk with the VOLAX futures: Some first results, *Eleventh Annual CBT European Futures Research Symposium Proceedings,* Marseille, France (September).

Robert E. Whaley, 1997, Commentary on international transmission of option volatility and skewness: When you're smiling, does the whole world smile?, *Tenth Annual CBT European Futures Research Symposium Proceedings,* London, England (September).

Robert E. Whaley, 1996, Commentary on liquidity in the Australian SPI futures market following a redenomination of the contract, *Seventh Annual CBT Pacific Basin Futures Research Symposium Proceedings,* Singapore (February).

Robert E. Whaley, 1995, Commentary on Nikkei futures contracts on the SIMEX: A microstructure analysis, *Sixth Annual CBT Pacific Basin Futures Research Symposium Proceedings,* Hong Kong (March).

Working Papers: Completed

Kathryn Barraclough, David T. Robinson, Tom Smith and Robert E. Whaley, Using option prices to infer overpayments and synergies in M&A transactions, Last revised: June 2011.

Robert E. Whaley, Trading volatility: At what cost?, Last revised: August 2012.

Work in Progress:

Nicolas P.B. Bollen and Robert E. Whaley, On the supply of and demand for volatility.

Editorships:

Associate Editor, *Advances in Futures and Options Research*, 1987-present.
Associate Editor, *Australian Journal of Management*, 2010-present.
Associate Editor, *Canadian Journal of Administrative Sciences*, 1995-1998.
Editorial Board, *China Accounting and Finance Review*, 1998-2000.
Associate Editor, *Financial Management Journal*, 2009-2014.
Associate Editor, *Journal of Derivatives*, 1992-present.
Associate Editor, *Journal of Finance*, 1991-2000.
Associate Editor, *Journal of Financial Economics*, 1989-1998.
Associate Editor, *Journal of Futures Markets*, 1995-present.
Editorial Board, *Journal of Risk*, 1998-2006.
Associate Editor, *Management Science*, 1988-1989.
Editorial Board, *Pacific-Basin Finance Journal*, 2003-present.
Co-Editor, *Review of Futures Markets*, 1987-1999.

Referee Service:

Accounting Review
Advances in Futures and Options Research
American Journal of Agricultural Economics
Australian Journal of Management
Canadian Journal of Administrative Sciences
Econometrica
Energy Journal
European Economic Review
European Financial Review
Financial Analysts Journal
Financial Management
Financial Review
International Options Journal
Hong Kong Research Grants Council
Hong Kong University of Science and Technology
UGC Research Infrastructure Grants programme
Journal of Banking and Finance
Journal of Business
Journal of Business and Economic Statistics
Journal of Econometrics
Journal of Economics and Business
Journal of Empirical Finance
Journal of Finance
Journal of Financial Economics
Journal of Financial Engineering
Journal of Financial and Quantitative Analysis
Journal of Financial Research
Journal of International Money and Finance
Journal of Political Economy
Journal of Portfolio Management
Journal of Risk
Management Science
National Science Foundation
Pacific-Basin Finance Journal
Quantitative Finance

Quarterly Journal of Business and Economics
Quarterly Review of Economics and Business
Review of Derivatives Research
Review of Financial Studies
Review of Research in Futures Markets
Small Business Administration
Social Science and Humanities Research Council of Canada

Consulting Service:

Served as consultant to major investment houses, futures and options exchanges, law firms, governmental agencies, and a major accounting firm.

August 7, 2012

ROBERT E. WHALEY
Supplemental Information

Presentations:

Trading Volatility: At What Cost?

* 9th Annual Rothschild Caesarea Summit, Interdisciplinary Center (IDC), Tel Aviv, Israel, May 2012.

Financial Innovation: At What Cost?

* Financial Markets Research Center conference, Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, May 2012.

Trading Volatility: Caveat Emptor

* MidSouth Alternative Investment Association meeting, Nashville, Tennessee, April 2012.
* Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, April 2012.

Fear and Volatility: Six Facts about VIX

* Keynote speaker, 2012 Berkeley-Haas Finance Conference "Opportunities in Volatile Times, University of California, Berkeley, March 2012.

Financial Innovation

* Fall Faculty Assembly, Vanderbilt University, Nashville, Tennessee, August 2011.

Trading Relative Performance with Alpha Indexes

* Keynote speaker, Australasian Microstructure Conference, School of Finance, Actuarial Studies and Applied Statistics, College of Business and Economics, Australian National University, July 2011.
* Financial Markets Research Center conference, Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, May 2011.
* Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, October 2010.

How Some People Make Money from Other People's Failure to Exercise

* Financial Markets Research Center conference, Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, March 2010.

Trading Volatility

* Keynote speaker, 2009 European FMA, Turin, Italy, June 2009.

Failure to Exercise Put Options and the Short Stock Interest Strategy

* School of Finance and Applied Statistics, Australian National University, Canberra, AU, March 2009.

Understanding VIX

* School of Finance and Applied Statistics, Australian National University, Canberra, AU, March 2009.
* Keynote speaker, 13th Annual Super Bowl of Indexing, Phoenix, AZ, December 2008.

CBOE's Put-Write Index: An Explanation of Its Abnormal Performance

* Distinguished speaker, 24th Annual Risk Management Conference, Bonita Springs, FL, March 2008.

Spurious Dichotomous Variable Regressions in Financial Economics

* Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, November 2005.

Bid/Ask Spreads: A Comparative Analysis

* Invited speaker, Conference on Current Issues in Institutional Equity Trading, The Duke Global Capital Markets Center & The New York Stock Exchange, West Palm Beach, Florida, December 2003.

Modeling the Bid/Ask Spread: Measuring the Inventory-Holding Premium

* Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, November 2002.
* Distinguished speaker, Commodity Futures Trading Commission, Washington, D.C., October 2002.

Derivatives: Research Directions

* Distinguished speaker and panelist, Doctoral Consortium, Financial Management Association, San Antonio, TX, October 2002.

A New Game in Town

* Keynote speaker, The Canada Cup of Indexing, Montreal, Quebec, Canada, April 2002.

Return and Risk of the CBOE Buy-write Monthly Index

* Invited speaker, 19th Annual Risk Management Conference, San Antonio, TX, March 2003.
* Invited speaker, 18th Annual Risk Management Conference, St. Petersburg, FL, January 2002.

Stock Splits: Implications for Investor Trading Costs

* Plenary speaker, 1999 Asia-Pacific Finance Association Conference, Melbourne, Australia, July 1999.
* Department of Finance and Accounting, The National University of Singapore, Singapore, July 1999.

Index Derivatives and Market Volatility: Financial Innovation at Its Best

* Guest speaker, Fifth NUS Seminar on Finance, The National University of Singapore, Singapore, July 1999.

Volatility Derivatives: The Volax Futures Contract

* Chicago Board of Trade Research Symposium, Marseille, France, October 1998.

Market Volatility

* Pricing and Valuing Options Conference, University of Pretoria, Pretoria, South Africa, August 1998.

Is the Dow Different?

* Chicago Board of Trade Research Symposium, Chicago, Illinois, December 1997.

Understanding Smiles

* Chicago Board of Trade European Research Symposium, London, England, September 1997.

The S&P Game

* Australian Graduate School of Management, University of New South Wales, Sydney, Australia, March 1997.

Derivative Markets: Past, Present, and Future

* Keynote speech, Center for Public and Business Administration, National Chengchi University, Taipei, Taiwan, January 1996.

Deterministic Volatility Functions: Empirical Tests

* Jones Graduate School of Administration, Rice University, Houston, Texas, September 1996.
* Australian Graduate School of Management, University of New South Wales, Sydney, Australia, April 1996.
* Hong Kong Polytechnic University, Hong Kong, February 1996.
* Rotman Center for Management, University of Toronto, Toronto, Ontario, November 1995.
* Anderson School of Management, University of New Mexico, October 1995.

Predicting Stock Market Volatility: A New Measure

* Chicago Board of Trade Fall Research Symposium, Chicago, IL, December 1994.
* Berkeley Program in Finance, Ojai Valley, CA, September 1994.

What Can/Should Practitioners Learn from Financial Econometricians.

* Conference on Stochastic Volatility, École des Hautes Études Commerciales (HEC), Montreal, Canada, October 1994.

Uses of the Volatility Index

* School of Accountancy, University of Waterloo and KPMG Peat Marwick Thorne Research Seminar, Toronto, Ontario, Canada, October 1994.

Valuing Spread Options

* New York Mercantile Exchange, Houston, TX, September 1994.
* New York Mercantile Exchange, New York, NY, July 1994.

Derivatives on Market Volatility: Hedging Tools Long Overdue

* Conference on Risk Management, Vanderbilt University, Nashville, Tennessee, April 1993.
* Ninth Annual CBOE/CBOT Risk Management Conference, Phoenix, Arizona, January 1993.

Trading Costs and the Relative Rates of Price Discovery in the Stock, Futures and Options Markets

* College of Business Administration, University of Iowa, February 1995.
* Jones Graduate School of Administration, Rice University, Houston, Texas, April 1994.
* Western Finance Association meetings, Whistler, British Columbia, June 1993.

Mean Reversion of S&P 500 Index Basis Changes: Arbitrage-Induced or Statistical Illusion?

* Money, Finance, Banking, and Insurance Symposium, University of Karlsruhe, Karlsruhe, Germany, December 1993.
* College of Science and Administrative Studies, Laval University, Quebec City, Canada, November 1993.
* The Erasmus Center of Financial Research, Erasmus University, Rotterdam, The Netherlands, December 1992.
* Western Finance Association, San Francisco, California, June 1992.
* Faculty of Management Studies, University of Toronto, Toronto, Canada, November 1991.
* School of Business Administration, University of Michigan, Ann Arbor, Michigan, November 1991.
* School of Business, University of North Carolina, Chapel Hill, October 1991.

One Market? Stocks, Futures and Options During October 1987

* American Finance Association meetings, New Orleans, Louisiana, January 1992.

Predictability of Basis Changes

* Fifth Annual European CBT Futures Research Symposium, Leuven, Belgium, September 1992.

Assessing the Costs of Regulation: The Case of Dual Trading

* Western Finance Association, San Francisco, California, June 1992.
* School of Business, Indiana University, Bloomington, Indiana, March 1992.
* Cox School of Business, Southern Methodist University, Dallas, Texas, February 1992.
* The College of Business Administration, The University of Oklahoma, Norman, Oklahoma, February 1992.
* Northern Finance Association meetings, Banff, Alberta, September 1990.
* Conference on Volatility and Market Structure, Vanderbilt University, April 1990.

Expiration-Day Effects: What Has Changed?

* American Stock Exchange Options Colloquium X, New York University Graduate Center, New York, New York, March 1990.

Market Volatility Prediction and the Efficiency of the S&P 100 Index Option Market

* The Seminar on Analysis of Security Prices, University of Chicago, Chicago, Illinois, May 1992.
* American Stock Exchange Options Colloquium XII, New York University Graduate Center, New York, New York, March 1992.
* American Finance Association meetings, New Orleans, Louisiana, January 1992.
* CRF Conference, Istituto Mobiliare Italiano, Rome, Italy, September 1991.
* College of Business Administration, University of Cincinnati, Cincinnati, Ohio, May 1990.
* Pamplin College of Business, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, March 1990.
* Simon Graduate School of Management, University of Rochester, Rochester, New York, November 1989.
* The Wharton School, University of Pennsylvania, Philadelphia, Pennsylvania, November 1989.
* Options: Recent Advances in Theory and Practice, University of Warwick, Coventry, England, September 1989.

Stock Market Structure and Volatility

* Imperfections in Financial Markets Conference, Minaki, Ontario, Canada, June 1989.

Intraday Price Change and Trading Volume Relations in the Stock and Stock Option Markets

* Second International Conference of Finance, Centre HEC-ISA, Jouy-En-Josas, France, June 1988.

Dynamics of Stock Index and Stock Index Futures Returns

* ORSA/TIMS, Vancouver, British Columbia, May 1989.
* Olin School of Business, Washington University, St. Louis, Missouri, September 1988.
* Fuqua School of Business, Duke University, Durham, North Carolina, March 1988.
* College of Business, Ohio State University, Columbus, Ohio, March 1988.
* Faculty of Administrative Studies, York University, Toronto, Ontario, Canada, January 1988.
* Institute for Quantitative Research in Finance Seminar, Colorado Springs, Colorado, October 1987.

Expiration Day Effects of Index Options and Futures Program Trading and Expiration Day Effects

* The Seminar on Analysis of Security Prices, University of Chicago, Chicago, Illinois, November 1986.
* Chicago Board of Trade Research Seminar, Chicago, Illinois, May 1986.

Valuation of American Futures Options: Theory and Empirical Tests

* American Stock Exchange Options Colloquium VI, New York University Graduate Center, New York, New York, March 1986.
* Department of Finance, University of Texas at Austin, Austin, Texas, February 1986.
* American Finance Association, New York, New York, December 1985.
* Owen Graduate School of Management, Vanderbilt University, Nashville, Tennessee, October 1985.

The Valuation of American Call Options and the Expected Ex-Dividend Stock Price Decline

* Western Finance Association, Colorado Springs, Colorado, June 1986.
* Kellogg Graduate School of Management, Northwestern University, Evanston, Illinois, April 1986.
* Fuqua School of Business, Duke University, Durham, North Carolina, January 1986.

* College of Business and Public Administration, University of Arizona, December 1985.
* Faculty of Business, University of Alberta, Edmonton, Alberta, September 1985.
* Simon Fraser University, Burnaby, British Columbia, July 1985.

New Option Instruments: Arbitrageable Linkages and Valuation

* Money, Banking and Insurance Symposium, University of Karlsruhe, December 1984.

On Valuing American Futures Options

* Faculty of Business, University of Alberta, Edmonton, Alberta, April 1984.

Taxes, Financial Policy and Firm Size

* Small Business Administration, Washington, D.C., March 1984.

Transaction Costs and the Small Firm Effect

* Institute for Quantitative Research in Finance Seminar, Colorado Springs, Colorado, October 1983.
* Faculty of Management, University of Calgary, Calgary, Alberta, June 1982.
* Faculty of Management Studies, University of Toronto, Toronto, Ontario, November 1981.
* Department of Finance, University of Illinois at Chicago Circle, Chicago, Illinois, June 1981.

The Mean Variance Capital Asset Pricing Model with Transaction Costs and Short Selling Restrictions

* Western Finance Association, San Diego, California, June 1980.

Session Chairman/Paper Discussant/Paper Selection Committee:

Western Finance Association Meeting, Las Vegas, NV, June 2012
Western Finance Association Meeting, Santa Fe, NM, June 2011
Western Finance Association Meeting, Victoria, British Columbia, Canada, June 2010
Western Finance Association Meeting, San Diego, CA, June 2009
Financial Management Association European meetings, Torin, Italy, June 2009
Western Finance Association Meeting, Waikoloa, Hawaii, June 2008
Western Finance Association Meeting, Big Sky, Montana, June 2007
American Finance Association Meeting, Boston, MA, January 2006
Financial Management Association, Chicago, IL, October 2005
Western Finance Association Meeting, Los Cabos, Mexico, June 2003
American Finance Association Meeting, Washington, DC, January 2003
American Finance Association Meeting, New Orleans, LA, January 2000
American Finance Association Meeting, New York, NY, January 1999
American Finance Association Meeting, Chicago, IL, January 1998
Western Finance Association Meeting, Sunriver, Oregon, June 1996
American Finance Association Meeting, Washington, D.C., January 1995
Federal Reserve Bank Meeting, Coconut Grove, FL, February 1994
Western Finance Association Meeting, Whistler, British Columbia, June 1993
American Finance Association Meeting, Anaheim, California, January 1993
American Finance Association Meeting, New Orleans, Louisiana, January 1992
Western Finance Association Meeting, Jackson Hole, WY, June 1991
American Finance Association Meeting, Washington, D.C., December 1990
Northern Finance Association Meeting, Banff, Alberta, September 1990
Western Finance Association Meeting, Santa Barbara, CA, June 1990
Northern Finance Association Meeting, Ottawa, Ontario, September 1989
Options: Recent Advances in Theory and Practice, University of Warwick, Coventry, England, September 1989
Western Finance Association Meeting, Seattle, Washington, June 1989

Imperfections in Financial Markets Conference, Minaki, Ontario, Canada, June 1989
ORSA/TIMS Meeting, Vancouver, British Columbia, May 1989
American Finance Association Meeting, New York, New York, December 1988
Western Finance Association Meeting, Napa, California, June 1988
Western Finance Association Meeting, San Diego, California, June 1987
American Finance Association Meeting, New Orleans, Louisiana, December 1986
Financial Management Association, New York, New York, October 1986
Chicago Board of Trade Research Symposiums: Paper selection committee chairman for derivatives research symposiums 1987-1998. Responsible for program content in:

Month	*Location*	*Month*	*Location*
United States		**Europe**	
Dec-87	Chicago Board of Trade, Chicago, IL	Oct-88	Barcelona, Spain
May-88	Chicago Board of Trade, Chicago, IL	Oct-89	Paris, France
Dec-88	Chicago Board of Trade, Chicago, IL	Oct-90	The Hague, The Netherlands
May-89	Chicago Board of Trade, Chicago, IL	Oct-91	Porto, Portugal
Dec-89	Duke University, Durham, NC	Oct-92	Brussels, Belgium
May-90	Chicago Board of Trade, Chicago, IL	Oct-93	Manchester, England
Dec-90	Vanderbilt University, Nashville, TN	Oct-94	Bonn, Germany
May-91	Chicago Board of Trade, Chicago, IL	Sep-95	Barcelona, Spain
Dec-91	Chicago Board of Trade, Chicago, IL	Sep-96	Tilburg, The Netherlands
May-92	Chicago Board of Trade, Chicago, IL	Sep-97	London, England
Dec-92	Chicago Board of Trade, Chicago, IL	Sep-98	Marseille, France
May-93	Chicago Board of Trade, Chicago, IL		
Dec-93	Chicago Board of Trade, Chicago, IL	**Pacific Basin**	
May-94	Chicago Board of Trade, Chicago, IL	Jul-90	Hong Kong
Dec-94	Chicago Board of Trade, Chicago, IL	Jul-91	Singapore
May-95	Chicago Board of Trade, Chicago, IL	Mar-92	Hong Kong
Dec-95	Rice University, Houston, TX	Mar-93	Hong Kong
May-96	Chicago Board of Trade, Chicago, IL	Mar-94	Taipei, Taiwan
Dec-96	Chicago Board of Trade, Chicago, IL	Mar-95	Hong Kong
May-97	Chicago Board of Trade, Chicago, IL	Feb-96	Singapore
Dec-97	Chicago Board of Trade, Chicago, IL	Feb-97	Hong Kong
		Feb-98	Sydney, Australia
		Feb-98	Hong Kong

Ph.D. Committee Service:

S. Kim, *Price Discovery from Peers,* Owen Graduate School of Management, Vanderbilt University, 2008.

K. Barraclough, *A State Contingent Claim Approach to Asset Valuation,* Australian National University, 2007. (External examiner)

L. Bai, *The Intraday Price Effect of the Short Sale Uptick Rule–Can It Alleviate Downward Price Pressure,* Fuqua School of Business, Duke University, 2006. (Chairman).

K. Felixson, *Finnish Short Term Stock Returns,* Swedish School of Economics and Business Administration, Department of Finance and Statistics, 2003. (External examiner)

R. Guido, *Essays on the Role of Information in Financial Markets,* Australian Graduate School of Management, University of New South Wales, 2003. (External examiner)

K.D. Walsh, *Essays in Asset Pricing,* Australian Graduate School of Management, University of New South Wales, 2003. (External examiner)

E.A. Kalotay, *Portfolio Efficiency and Model Uncertainty,* Australian Graduate School of Management, University of New South Wales, 2001. (External examiner)

P. Gray, *Bayesian Methods in Empirical Finance,* Australian Graduate School of Management, University of New South Wales, 2000. (External examiner)

K.R. Pattenden, *Tax Effects in Corporate Finance: Three Essays*, Australian Graduate School of Management, University of New South Wales, 2000. (External examiner)

N.P.B. Bollen, *The Valuation of Options in Regime-Switching Models*, Fuqua School of Business, Duke University, 1997. (Chairman)

K. Kantor, Stock Option Evaluator, Fuqua School of Business/Department of Computing Science, Duke University (Master's thesis).

G.L. Gannon, Models of Simultaneous Volatility, Monash University, Clayton, Australia, 1997.

P. Dennis, *Using Linear Programming to Establish Optimal Bid-Ask Arbitrage Bounds on S&P 500 Index Options*, Kenan-Flagler School of Business, University of North Carolina at Chapel Hill, 1996.

D. Guo, *Essays on Implied Stochastic Volatility From Currency Options*, Department of Economics, University of Toronto, 1995.

C.M. Kirby, *Interpreting Evidence of Predictable Variation in Stock and Bond Returns*, Fuqua School of Business, Duke University, 1994.

B. Ostdiek, *Empirical Investigations of the World Ex Ante Risk Premium and the Flow of World Information*, Fuqua School of Business, Duke University, 1994. (Co-Chairman)

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