113. Mr. Arnott had knowledge of the aforementioned article and the product commercialized by Paul Wood and Counsel Trust when he submitted his sworn Declaration.

114. Mr. Arnott made similar false statements in the other applications, *e.g.*, the '577, '502, and '740 Patent applications.

115. At least named inventor Robert Arnott and Research Affiliates' prosecuting attorney, Ralph Albrecht owed the USPTO a duty of candor and good faith in connection with the applications that led to the patents-in-suit.

116. On March 5, 2005, Robert Arnott executed a Combined Declaration for Patent Application and Power of Attorney in connection with the application for the '719 Patent ("the '719 Patent Inventors' Declaration"), in which he stated that he had reviewed and understood the contents of the specification, including the claims. By signing the '719 Patent Inventors' Declaration, Robert Arnott explicitly acknowledged his duty to disclose to the USPTO information that is material to the examination of the application for the '719 Patent in accordance with 37 C.F.R. § 1.56.

117. On November 17, 2006, Robert Arnott executed a Combined Declaration for Patent Application and Power of Attorney in connection with the application for the '502 Patent ("the '502 Patent Inventors' Declaration"), in which he stated that he had reviewed and understood the contents of the specification, including the claims. By signing the '502 Patent Inventors' Declaration, Robert Arnott explicitly acknowledged his duty to disclose to the USPTO information that is material to the examination of the application for the '502 Patent in accordance with 37 C.F.R. § 1.56.

118. On November 15, 2007, Robert Arnott executed a Combined Declaration for Patent Application and Power of Attorney in connection with the application for the '740 Patent ("the '740 Patent Inventors' Declaration"), in which he stated that he had reviewed and understood the contents of the specification,

including the claims. By signing the '740 Patent Inventors' Declaration, Robert Arnott explicitly acknowledged his duty to disclose to the USPTO information that is material to the examination of the application for the '740 Patent in accordance with 37 C.F.R. § 1.56.

119. Robert Arnott was not unsophisticated about IP matters including the inventor's duty of disclosure to the USPTO. For example, on November 8, 2004, in an email to several individuals including Paul Wood, Robert Arnott demonstrated full appreciation of the duty of candor and good faith to the USPTO when he warned the inventor of a competing patent application: "[H]e has a *legal* obligation to note prior art (GSAM and Morris) in his patent applications…else the patent is likely to be voided on fraudulent misrepresentation grounds." (Exh. A, Nov. 8, 2004 email from Arnott). Robert Arnott was well aware of his duty to disclose prior art to the USPTO.

120. By prosecuting and ultimately obtaining allowance of claims directed to methods of selecting and weighting assets on factors other than price to create an index, the Robert Arnott and Ralph Albrecht asserted that they were entitled to those claims, and that those claims met the statutory requirements of patentability. Upon information and belief, at least Robert Arnott and Ralph Albrecht knew before the issuance of the patents-in-suit that the Dow Jones Select Dividend Index and the iShares Dow Jones Select Dividend Index Fund selected and weighted assets on a factor other than price.

121. At least Robert Arnott and Ralph Albrecht breached their duty of candor and good faith with intent to deceive the US PTO by failing to disclose the Dow Jones Select Dividend Index and the iShares Dow Jones Select Dividend Index Fund. Additional facts about the intent of Robert Arnott and Ralph Albrecht to deceive the USPTO are believed to be in the exclusive control of Research Affiliates and its attorneys and cannot be reasonably known to Defendants without discovery.

122. But for Robert Arnott's and Ralph Albrecht's failure to disclose the iShares Dow Jones Select Dividend Index Fund and its underlying Dow Jones Select Dividend Index to the USPTO, at least claims 1-4, 15, 18-20, 23, 31, 33-34, 38-41, 49 and 52-55 of the '502 Patent, claims 1 and 34-36 of the '719 Patent and claims 1, 6, 8, 10, 23-25 and 73 of the '740 Patent would not have been issued or allowed by Patent Office.

123. In sum, on information and belief, at least claims 1-4, 15, 18-20, 23, 31, 33-34, 38-41, 49 and 52-55 of the '502 Patent; claims 1 and 34-36 of the '719 Patent; and claims 1, 6, 8, 10, 23-25 and 73 of the '740 Patent would not have issued or been allowed but for Robert Arnott's and Ralph Albrecht's foregoing material misrepresentations and omissions, and Robert Arnott and Ralph Albrecht made each of the foregoing misrepresentations and omissions with a specific intent to deceive the USPTO.

Robert Arnott's Failure to Disclose the work of David Morris using the FTSE for the GWA Wealth-Based Index to the USPTO

124. Robert Arnott engaged in inequitable conduct during the prosecution of the applications for the '502, '719 and '740 patents (collectively, the "patents-in-suit") in the United States Patent and Trademark Office ("USPTO") by withholding David Morris' work using FTSE for the GWA Wealth-based Indexes from the Examiner during prosecution. That inequitable conduct renders the patents-in-suit and each of their claims unenforceable.

125. But for Robert Arnott's failure to disclose David Morris's work and the FTSE GWA Indexes to the USPTO, at least claim 1 of the '502 Patent, claim 1 of the '719 Patent, and claim 1 of the '740 Patent would not have issued or been allowed by Patent Office.

126. The FTSE All-Share Index was originally called the FT Actuaries All-Share Index at its inception in 1962. The Index was then enhanced with the addition

of two new sub-indices, namely the FTSE 100 and FTSE 250 in January 1984 and October 1992 respectively. (FTSE All-Share Index Fact Sheet at 1).

127. David Morris of Global Wealth Allocation ("GWA") reached an agreement with the FTSE to launch an active index that reweights the underlying FTSE market capitalization index by company book value, cash flow and net profit. (D. Morris and T. Leake, *Where Next For The Index Business Model?*, JOURNAL OF INDEXES, May/June 2006 at 25).

128. On July 14, 2005 FTSE and GWA announced seven new "non-price" based indexes. The new indexes were weighted "not by market capitalisation, but by net income, cash flow, and book value." (July, 14, 2005 Press Release "New non-price indices from FTSE Group and GWA").

129. In his 2006 article, Mr. Arnott distinguished the earlier work of David Morris but acknowledged that Mr. Morris's work starting in 2003 reweighting the FTSE All-Share Index was "the **functional equivalent** of a **true Fundamental Index™** of all companies." (Arnott, *An Overwrought Orthodoxy*, INSTITUTIONAL INVESTOR, Dec. 2006 at 40, (emphasis added)).

130. "Fundamental Index™" referred to the fundamental indexes marketed by Robert Arnott and Research Affiliates. On information and belief, "Fundamental Index™" referred to the fundamental indexes Robert Arnott and Research Affiliates were seeking to patent. Therefore, upon belief and understanding, Robert Arnott's statement that the Morris FTSE GWA Index work was the "functional equivalent" meant that he understood that work to be highly relevant to the applications leading to the patents-in-suit.

131. Publications by David Morris regarding his work in 1997 and 2001 on an EAFE GWA Index were cited to the USPTO examiner during prosecution of the patents-in-suit. However, no disclosure was made regarding David Morris's work using FTSE that Robert Arnott called the "functional equivalent" of his own.

132. Upon information and belief, the asserted claims of the patents-in-suit have a priority date no earlier than February 2004.

133. On information and belief, David Morris's work and the FTSE GWA Indexes, therefore are prior art to the Patents-in-Suit under, at least, 35 U.S.C. §§ 102(a) and 102(g).

134. David Morris's work and the FTSE GWA Indexes are but for material under 35 U.S.C. §§ 102 and 103 for at least claim 1 of the '502 Patent, claim 1 of the '719 Patent, and claim 1 of the '740 Patent. Moreover, the FTSE GWA Indexes in combination with other prior art renders the asserted claims of the Patents-in-Suit obvious. Had the USPTO Examiner known of the FTSE GWA Indexes, these claims would not have issued.

135. Based on Robert Arnott's admission that Mr. Morris's work on the FTSE GWA Indexes was "the functional equivalent" to the indexes created by Research Affiliates, on information and belief, the FTSE GWA Indexes are but-for material references that are but for material under 35 U.S.C. §§ 102 and 103 for at least one claim from each of the Patents-in-Suit.

136. Furthermore, any differences between the asserted claims of the Patents-in-Suit and David Morris's work on the FTSE GWA Indexes are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made.

137. Because David Morris's work on the FTSE GWA Indexes discloses each of the limitations of claim 1 of the '502, '719 and '740 Patents, the FTSE GWA Indexes are therefore but-for material prior art.

138. Mr. Morris's work on the FTSE GWA Indexes was not cumulative of references cited during the prosecution of the applications leading to the patents-in-suit. The prosecution record of the patents-in-suit does not reflect disclosure by Mr. Arnott or consideration by the patent examiner of the Morris FTSE GWA Indexes.

139. As reflected by the statement in the 2006 article referenced above, Mr. Arnott knew during the prosecution of the applications that led to the patents-in-suit that Mr. Morris's work on FTSE GWA Indexes was material prior art.

140. On November 7, 2004 the New York Times published an article entitled "Why your stock index fund is lagging the market" that attributed Robert Arnott as the "creator" of the idea to weight stock according to variables other than market cap. (M. Hulbert, *Why Your Stock Index Fund Is Lagging The Market*, N.Y. TIMES, Nov. 7, 2004).

141. In response to that article, a colleague of Paul Wood, Richard Evans, notified the New York Times that Mr. Wood in fact was the "creator" of this approach, not Mr. Arnott. Responding to this allegation, Mr. Arnott stated:

> "[A]s I've already noted to Paul [Wood], **he has a *legal* obligation to note prior art (GSAM and Morris) in his patent applications**. This prior art, coupled with the fact that his 'patent' is so broad as to encompass investment strategies based on P/E or ROE, will almost certainly mean that no patent will be granted. We have already amended our far narrower patent application to acknowledge Paul's work (and the reasons that we think it's not applicable). He has a legal obligation to do the same with his applications, else the patent is likely to be voided on fraudulent misrepresentation grounds."

(Exh. A, Nov. 8, 2004 email from Arnott (emphasis added)).

142. Despite Mr. Arnott's knowledge of Mr. Morris's work and the FTSE GWA Indexes, and his clear understanding that material prior art must be disclosed to the USPTO, he failed to disclose Mr. Morris's work on FTSE GWA Indexes to the USPTO with the intent to deceive the USPTO.

143. As discussed above in paragraphs 115-118, Robert Arnott, owed the USPTO a duty of candor and good faith in connection with the applications that led to the Patents-in-Suit.

144. By prosecuting and ultimately obtaining allowance of claims directed to methods of selecting and weighting assets on factors other than price, the Applicants including Robert Arnott asserted that they were entitled to those claims, and that those claims met the statutory requirements of patentability. Upon information and belief, however, the Applicants, including Robert Arnott, knew before the issuance of the Patents-in-Suit that David Morris's work and the FTSE GWA Indexes weighted assets on a factor other than price.

145. At least Mr. Arnott breached his duty of candor and good faith with intent to deceive the US PTO by failing to disclose Mr. Morris's work on the FTSE GWA Indexes which he had conceded was the "functional equivalent" to his own. Additional facts about the intent of Mr. Arnott to deceive the USPTO are believed to be in the exclusive control of Research Affiliates and its attorneys and cannot be reasonably known to Defendants without discovery.

146. But for Robert Arnott's failure to disclose David Morris's work and the FTSE GWA Indexes to the USPTO Examiner, at least claims 1 of the '502 Patent, '719 Patent and the '740 Patent would not have issued or been allowed by Patent Office.

147. In sum, on information and belief, at least 1 claim of each of the patents-in-suit would not have been issued or allowed but for Robert Arnott's foregoing material omissions, and Robert Arnott made each of the foregoing omissions with a specific intent to deceive the USPTO.

Robert Arnott's Failure to Disclose Robert C. Jones's Earning-Weighted Index and GSAM's Earnings-Weighted Index Fund to the USPTO

148. As a named inventor, Robert Arnott engaged in inequitable conduct during the prosecution of the applications for the '502, '719 and '740 patents (collectively, the "patents-in-suit") in the United States Patent and Trademark Office ("USPTO") by withholding the Earnings-Weighted Index developed by Robert C. Jones of Goldman Sachs Asset Management ("GSAM") and GSAM's Earnings-

Weighted Index Fund from the examiner during prosecution. That inequitable conduct renders the patents-in-suit and each of their claims unenforceable.

149. But for Robert Arnott's failure to disclose Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund , at least claims 1-4, 15, 18-20, 23, 31, 33-34, 38-41, 49 and 52-55 of the '502 Patent; claims 1 and 34-36 of the '719 Patent; and claims 1, 6, 8, 10, 23-25 and 73 of the '740 Patent would not have issued or been allowed by the USPTO.

150. On August 31, 1988, Robert C. Jones authored an article Portfolio Strategy: Stock Selection. (Goldman Sachs Portfolio Strategy, Aug. 31, 1988 (hereinafter "Jones-88")).

151. On August 6, 1990, Robert C. Jones was interviewed for an article in Pensions & Investments entitled "Earnings Basis for Weighting Stock Portfolios." (PENSIONS & INVESTMENTS, *Earnings basis for weighting stock portfolios*, Aug. 6, 1990 (hereinafter "Jones-90")).

152. In 1990, Mr. Jones also publicly disclosed a presentation entitled "Quantitative Equity: Earnings Weighted Index" (hereinafter "Jones-EWI").

153. Because Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund was the subject of publications and was also commercially available in the United States in the 1990s, it is prior art to the Patents-in-Suit under at least 35 U.S.C. §§ 102(a) and (b). (Jones-90 (noting "the firm manages about $50 million for one pension fund client using the earnings-weighted index fund approach.").

154. Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund are but for material under 35 U.S.C. §§ 102 and 103 for at least claims 1-4, 15, 18-20, 23, 31, 33-34, 38-41, 49 and 52-55 of the '502 Patent; claims 1 and 34-36 of the '719 Patent; and claims 1, 6, 8, 10, 23-25 and 73 of the '740 Patent. Moreover, Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund in combination with other prior art renders the

asserted claims of the Patents-in-Suit obvious. Had the USPTO Examiner known of Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund, these claims would not have issued.

155. For example, Claim 1 of the '502 Patent claims a method of creating an index by selecting constituents of the index based upon at least one accounting data other than price; weighting the constituents of the index based upon at least one accounting data other than price; and managing the index. ('502 Patent at 21:1-36).

156. Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund disclose an "index of financial objects" constructed with a computer-implemented method meeting all the elements of claim 1 of the '502 Patent.

157. The method of claim 1of the '502 Patent creates, by at least one computer, the index of the financial objects. ('502 Patent at 21:5-6). Robert C. Jones disclosed such a method: "Goldman Sachs Asset Management, New York has developed a method for weighting stocks in an equity portfolio based on a company's adjusted earnings in relation to the total U.S. corporate earnings. The concept is the brainchild of Robert C. Jones, quantitative equity strategies manager at GSAM, who conceived of the weighting methodology while running some backtests in 1987. The firm manages about $50 million for one pension fund client using the earnings-weighted index fund approach. For the six months the firm has run an actual portfolio, the strategy has returned 2.5% vs. 2.2% for a model using reported earnings and 3.1% for the Standard & Poor's 500 stock index." (Jones-90, p. 1).

158. On information and belief, Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund was created and managed by using at least one computer or processor. In fact, Research Affiliates admitted during prosecution of App. No. 10/159,610 "that computers and processing systems were well known in the art in relation to construction and management of a financial

index or investment instruments…" (Response to Office Action in App. No. 10/159,610, submitted 6/9/2008 (pp.13-15), 5/4/2009 (pp. 13-14), and 2/8/2010 (pp. 18-19)). Thus, in the unlikely event Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund was found not to be created with a computer, it would have been obvious to create the index "by at least one computer" as claimed.

159. In the method of claim 1 of the '502 Patent the index is created by "selecting, by at least one computer, financial objects as constituents of the index based upon at least one accounting data regarding entities issuing the financial objects rather than price of the financial objects." ('502 Patent at 21:7-10). Robert C. Jones's Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund disclose such a selection: "If you can identify the ones that are undervalued and overvalued, then perhaps a stock selection system on top of this weighting system would make sense." (Jones-90, p. 2).

160. In the method of claim 1 of the '502 Patent the selection criteria of constituent financial objects must include at least one of several accounting data, including "cash flow of the entities issuing the financial objects, sales of the entities issuing the financial objects, book value of the entities issuing the financial objects or any dividends of the entities issuing the financial objects." ('502 Patent at 21:11-16). Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses such a selection: "The rationale for EWIs is contained in a 1980 article by Fischer Black entitled 'The Magic in Earnings' (available on request). In that study, Fischer demonstrates that earnings, rather than book value, is the best accounting estimate of a company's worth. We have recently updated this research to show that earnings is a better measure of value than any other readily-available accounting figure -- including cash flow, free cash flow, dividends, sales, assets, and EBITD. Earnings was also found to be a better, less volatile estimate of value than price itself." (Jones-EWI, p. 1).

161. In addition to "selecting," the index is created in the method of claim 1 of the '502 Patent by "weighting, by the at least one computer, the constituents of the index based upon at least one accounting data regarding the entities issuing the financial objects rather than price of the financial objects, to obtain constituent weightings of the constituents of the index." ('502 Patent at 21:17-22). Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund disclose such a weighting: "any cap-weighting scheme like an index fund will, almost by definition, mathematically over-weight the overvalued stocks and underweight the undervalued stocks. If you assume prices eventually will tend toward fair value, that would make an [market-cap-weighted] index fund a suboptimal portfolio. Our idea is to weight using another measure that is a better representation of the economic importance of the company [than market cap]." (Jones-90, pp. 1-2).

162. Like the selecting criteria, in the method of claim 1 of the '502 Patent, the weighting criteria of constituent financial objects must include at least one of several accounting data, including "cash flow of the entities issuing the financial objects, sales of the entities issuing the financial objects, book value of the entities issuing the financial objects or any dividends of the entities issuing the financial objects." ('502 Patent at 21:22-26). Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses such weighting criteria. The Earnings-Weighted Index "weight[s] stocks in an equity portfolio based on a company's adjusted earnings in relation to the total U.S. corporate earnings." (Jones-90, p. 1).

163. The method of claim 1 of the '502 Patent also includes a managing step providing for "managing, by the at least one computer, the index, and managing at least one portfolio of financial objects based on the index." ('502 Patent at 21:28-30). It was well known that Robert C. Jones and GSAM managed the Earnings-Weighted Index: "Goldman Sachs Asset Management, New York has developed a

method for weighting stocks in an equity portfolio based on a company's adjusted earnings in relation to the total U.S. corporate earnings. The concept is the brainchild of Robert C. Jones, quantitative equity strategies manager at GSAM, who conceived of the weighting methodology while running some backtests in 1987. The firm manages about $50 million for one pension fund client using the earnings-weighted index fund approach. For the six months the firm has run an actual portfolio, the strategy has returned 2.5% vs. 2.2% for a model using reported earnings and 3.1% for the Standard & Poor's 500 stock index." (Jones-90, p. 1).

164. The managing step of the method of claim 1 of the '502 Patent also includes "altering, by the at least one computer, the relative weightings of the financial objects within said at least one portfolio of financial objects based on the index as the at least one accounting data concerning the entities of the financial objects changes or the constituents of the index change over time" ('502 Patent at 21:31-36), which is also disclosed by the withheld prior art. For example, "How often is the portfolio rebalanced? We rebalance quarterly, pretty much in conjunction with the earnings cycle for companies on a calendar quarter." (Jones-90, p. 2). On information and belief, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund was rebalanced or re-weighted by using at least one computer or processor.

165. Any differences between the asserted claims of the '502 Patent and Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. Because Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses each of the limitations of claim 1 and claims 2-4, 15, 18-20, 23, 31, 33-34, 38-41, 49 and 52-55of the '502 Patent, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund were therefore but-for material prior art.

166. Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund also disclose "a method of constructing an index of assets" meeting all the elements of claim 1 of the '719 Patent.

167. The method of claim 1 of the '719 Patent constructs an index by first "**accessing** by the at least one analysis host processor of one or more databases storing and permitting retrieval of data (D) about a plurality of entities (E) and a plurality of corresponding assets (A) each issued by or having been issued by at least one of the plurality of entities (E)." ('719 Patent at 10:47-51). Second, the method of claim 1 of the '719 Patent constructs an index by "**receiving** by the at least one analysis host processor at least one objective measure of scale (O) regarding one or more of the plurality of said assets, or one or more of the plurality of said entities (E) associated with said corresponding assets (A)." ('719 Patent at 10:53-56). Third, the method of claim 1 of the '719 Patent constructs the index by "**retrieving** by the at least one analysis host processor one or more of said data (D) about said plurality of said entities (E) and said corresponding assets (A)." ('719 Patent at 10:57-59). On information and belief, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund was created and/or managed by accessing a database and receiving/retrieving data. Also, as Applicant has admitted that the use of computers for construction and management of indices or funds was well known in the art (Response to Office Action in App. No. 10/159,610, submitted 6/9/2008 (pp.13-15), 5/4/2009 (pp. 13-14), and 2/8/2010 (pp. 18-19)), it necessarily follows that the "accessing," "receiving," "retrieving," and "storing" of related data/information steps recited in claim 1 are also firmly in the prior art because these are all required computing operations.

168. Construction of the index claimed in method claim 1 of the '719 Patent also includes a "selecting" step: "selecting by the at least one analysis host processor a selection from said plurality of said assets (A) and said entities (E) to comprise a plurality of constituent index assets (IA) comprising the index of assets

(I)." ('719 Patent at 10:60-64). As discussed above for the '502 Patent, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund disclose such a selection: "If you can identify the ones that are undervalued and overvalued, then perhaps a stock selection system on top of this weighting system would make sense." (Jones-90, p. 2). On information and belief, a selection of "financial objects as constituents of the index" is performed to generate the EWI because the creation of EWI started with S&P500 components but ended up with 499 constituents. (See Jones-EWI, p. 11).

169. The "selecting" step of the method claim 1of the '719 Patent further comprises:

> "selecting by the at least one analysis host processor said one or more data (D) to be a quantitative data (Q) reflecting the amount of said at least one objective measure of scale (O) associated with each of said entities . . . wherein said at least one objective measure of scale (O) comprises a measure of size (SZ) of each said entity (E) associated with each said given asset (A), and wherein said measure of the size (SZ) of each said entity (E) corresponding to each said asset (A) comprises at least one of: a demographic measure of a said entity (E) associated with said asset (A); a financial metric of a said entity (E) associated with said asset (A); a metric from information disclosures of a publicly traded entity; or a metric from information about a said entity (E) associated with said asset (A)"

('719 Patent at 10:65-11:20). As discussed above, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses such a selection: "The rationale for EWIs is contained in a 1980 article by Fischer Black entitled 'The Magic in Earnings' (available on request). In that study, Fischer demonstrates that earnings, rather than book value, is the best accounting estimate of a company's worth. We have recently updated this research to show that earnings is

a better measure of value than any other readily-available accounting figure -- including cash flow, free cash flow, dividends, sales, assets, and EBITD. Earnings was also found to be a better, less volatile estimate of value than price itself." (Jones-EWI, p. 1). Thus, in selecting high earning companies for Earnings-Weighted Index, the various earnings data constitute "a financial metric of a said entity (E) associated with said asset (A)" and therefore "a measure of size (SZ)", as claimed.

170. Furthermore, the "selecting" step of method of claim 1comprises "ranking by the at least one analysis host processor said entities (E) based upon at least one of a said quantitative data (Q) associated with the at least one objective measure of scale (O) of each of said entities (E) and selecting by the at least one analysis host processor said selection from said plurality of said assets (A) or said entities (E) to comprise said plurality of constituent index assets (IA) based on said ranking." ('719 Patent at 11:21-29). As discussed above, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund disclose such a ranking: "If you can identify the ones that are undervalued and overvalued, then perhaps a stock selection system on top of this weighting system would make sense." (Jones-90, p. 2).

171. Finally, construction of the index claimed in the method claim 1 of the '719 Patent includes a "calculating" step:

> "calculating by the at least one analysis host processor proportional weights for the index of assets to be objective measure of scale weights (OW) substantially independent of the market prices (P) of any of said assets (A) and substantially independent of a market capitalization (MC) of any of said entities (E), wherein said calculating comprises: (i) adding by the at least one analysis host processor the quantitative data (Q) of each of said at least one objective measure of scale (O) for all of said constituent index assets

(IA) to yield a sum total quantitative data (SUMQ) for said at least one objective measure of scale (O); and (ii) determining by the at least one analysis host processor a relative size of the quantitative data (Q) of a said at least one objective measure of scale (O) for each said constituent index asset (IA) as a proportion of said sum total quantitative data (SUMQ) for said at least one objective measure of scale (O) to yield the objective measure of scale weight (OW) of each of the constituent index assets (IA) comprising the index of assets (I), wherein said at least one objective measure of scale (O) comprises a measure of size (SZ) of each said entity (E) associated with each said given constituent index asset (IA), and wherein said measure of the size (SZ) of each said entity (E) corresponding to each said constituent index asset (IA) comprises at least one of: a demographic measure of a said entity (E) associated with said constituent index asset (IA); a financial metric of a said entity (E) associated with said constituent index asset (IA); a metric from information disclosures of a publicly traded entity; or a metric from information about a said entity (E) associated with said constituent index asset (IA)."

('719 Patent at 11:30-65). As discussed above, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses such a step. "Goldman Sachs Asset Management, New York has developed a method for weighting stocks in an equity portfolio based on a company's adjusted earnings in relation to the total U.S. corporate earnings. The concept is the brainchild of Robert C. Jones, quantitative equity strategies manager at GSAM, who conceived of the weighting methodology while running some backtests in 1987. The firm manages about $50 million for one pension fund client using the earnings-weighted index fund approach. For the six months the firm has run an actual portfolio, the strategy

has returned 2.5% vs. 2.2% for a model using reported earnings and 3.1% for the Standard & Poor's 500 stock index." (Jones-90, p. 1).

172. Any differences between the asserted claims of the '719 Patent and Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. Because Robert C. Jones' Earnings-Weighted Index discloses each of the limitations of claims 1 and 34-36 of the '719 Patent, the Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund were therefore but-for material prior art.

173. The Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund also disclose "a computer-implemented method for constructing data indicative of a financial object index" meeting all the elements of claim 1 of the '740 Patent.

174. The method of claim 1of the '740 Patent "construct[s], by at least one computer processor, data indicative of the financial object index comprising selecting . . .data indicative of constituent financial objects of the financial object index based upon at least one accounting data. . . said at least one accounting data regarding at least one entity relating to each of said financial objects, the at least one entity comprising at least one of a region, a country, a company, or a sovereign associated with said each of said financial objects." ('740 Patent at 78:6-16). Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses such a method. "Goldman Sachs Asset Management, New York has developed a method for weighting stocks in an equity portfolio based on a company's adjusted earnings in relation to the total U.S. corporate earnings. The concept is the brainchild of Robert C. Jones, quantitative equity strategies manager at GSAM, who conceived of the weighting methodology while running some backtests in 1987. The firm manages about $50 million for one pension fund client

using the earnings-weighted index fund approach. For the six months the firm has run an actual portfolio, the strategy has returned 2.5% vs. 2.2% for a model using reported earnings and 3.1% for the Standard & Poor's 500 stock index." (Jones-90, p. 1).

175. In addition to "selecting," the index is constructed in the method of claim 1 of the '740 Patent by "weighting, by the at least one computer processor, data indicative of said constituent financial objects based upon at least one accounting data . . . said at least one accounting data regarding the at least one entity, to obtain data indicative of constituent weightings for each of said constituent financial objects." ('740 Patent at 17-23). As discussed above, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund disclose such a weighting: "any cap-weighting scheme like an index fund will, almost by definition, mathematically over-weight the overvalued stocks and underweight the undervalued stocks. If you assume prices eventually will tend toward fair value, that would make an [market-cap-weighted] index fund a suboptimal portfolio. Our idea is to weight using another measure that is a better representation of the economic importance of the company [than market cap]." (Jones-90, pp. 1-2).

176. The method of claim 1 of the '740 Patent also includes a storing step whereby "storing, by the at least one computer processor, said data indicative of said constituent financial objects and said constituent weightings on at least one computer storage device." ('740 Patent at 78:24-27). On information and belief, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund was constructed and/or managed by using at least one computer or processor, including for the purposes of storing said data on a computer storage device. Applicants repeatedly admitted during prosecution of Application Number 10/159,610 "that computers and processing systems were well known in the art in relation to construction and management of a financial index or investment instruments…" (Response to Office Action in App. No. 10/159,610, submitted

6/9/2008 (pp.13-15), 5/4/2009 (pp. 13-14), and 2/8/2010 (pp. 18-19)). Thus, even if Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund were not found to be constructed with a computer, it would have been obvious to construct the index and store data "by at least one computer" as claimed.

177. Claim 1 of the '740 Patent also broadly recites that the "financial "objects" . . . include one or more of the following:

> "a bond; a fixed income debt instrument; a debt instrument; an emerging market debt instrument; a high yield debt instrument; a corporate debt instrument; an investment grade debt instrument; a debenture; a bank loan; a convertible bond; a senior debt; a subordinated debt; a term loan; a government debt instrument; a government bond; a corporate bond; a high yield bond; an emerging market bond; a municipal bond debt instrument; a treasury bond debt instrument; a treasury bill debt instrument; a mortgage based debt instrument; a securitized debt instrument; a security; **a stock**; a commodity; a futures contract; a mutual fund; a hedge fund; a fund of funds; an exchange traded fund (ETF); a derivative; a negative weighting on any asset; an asset account; a separate account; a pooled trust; or a limited partnership."

('740 Patent at 78:32-79:1 (emphasis added)). It was well known that Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund were based on and comprised of stocks: "Goldman Sachs Asset Management, New York has developed a method for weighting stocks in an equity portfolio based on a company's adjusted earnings in relation to the total U.S. corporate earnings. (Jones-90, p. 1).

178. Lastly, the method of claim 1 of the '740 Patent requires that at least one accounting data comprise at least of "at least one financial metric of the at least one entity associated with each of said constituent financial objects; or at least one

metric, level, rate, or expenditure amount from information disclosures of the at least one entity." ('740 Patent at 79:1-6). In selecting high earnings companies for the Earnings-Weighted Index, the various earnings data constitute "at least one financial metric of the at least one entity associated with each of said constituent financial objects," and such data are well known to be from "information disclosures" (e.g., SEC filings and press releases) of the companies.

179. Any differences between the asserted claims of the '740 Patent and Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund are such that the subject matter as a whole would have been obvious to a person of ordinary skill in the art at the time the invention was made. Because Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses each of the limitations of claim 1 and claims 6, 8, 10, 23-25 and 73 of the '740 Patent, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund is therefore but-for material prior art.

180. Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund is not cumulative of references cited during the prosecution of the applications leading to the Patents-in-Suit. The prosecution record of the Patents-in-Suit reflects no indication that the index and fund disclosed in Robert C. Jones' Earnings-Weighted Index was considered by the patent examiner. Moreover, Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund discloses are but for material under 35 U.S.C. §§ 102 and 103 of the asserted claims of the Patents-in-Suit.

181. As reflected by the statement in the 2006 article referenced above, Robert Arnott knew during the prosecution of the applications that led to the Patents-in-Suit that Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund was material prior art. Mr. Arnott's 2006 article states "a number of money managers have experimented with fundamentally weighted portfolios over the years. **Robert Jones at Goldman Sachs Asset**

Management was, so far as I know, the first to do so, reweighting the S&P 500 on the basis of adjusted operating earnings. From 1990 to 1996 he managed money on this basis and beat the S&P 500 by 1.0 percentage point per year, but he never attracted serious assets." (R. Arnott, INSTITUTIONAL INVESTOR, *An Overwrought Orthodoxy* (Dec 2006) at 39 (emphasis added)).

182. On November 7, 2004 the New York Times published an article entitled "Why your stock index fund is lagging the market" that attributed Mr. Arnott as the "creator" of the idea to weight stock according to variables other than market cap. (M. Hubert, Why Your Stock Index Fund Is Lagging The Market, N.Y. Times, Nov. 7, 2004).

183. In response to that article, a colleague of Paul Wood, Richard Evans, notified the New York Times that Mr. Wood in fact was the "creator" of this approach, not Mr. Arnott. Responding to this allegation, Mr. Arnott stated:

> "[A]s I've already noted to Paul [Wood], **he has a *legal* obligation to note prior art (GSAM and Morris) in his patent applications**. This prior art, coupled with the fact that his 'patent' is so broad as to encompass investment strategies based on P/E or ROE, will almost certainly mean that no patent will be granted. We have already amended our far narrower patent application to acknowledge Paul's work (and the reasons that we think it's not applicable). He has a legal obligation to do the same with his applications, else the patent is likely to be voided on fraudulent misrepresentation grounds."

(Exh. A, Nov. 8, 2004 email from Arnott (emphasis added)).

184. Despite Mr. Arnott's knowledge of Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund, and his clear understanding that material prior art must be disclosed to the USPTO, he failed to disclose Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund to the USPTO with the intent to deceive the USPTO.

185. Robert Arnott, owed the USPTO a duty of candor and good faith in connection with the applications that led to the Patents-in-Suit. (See Paragraphs 115-118 above).

186. By prosecuting and ultimately obtaining allowance of claims directed to methods of selecting and weighting assets on factors other than price, the Applicants including Robert Arnott asserted that they were entitled to those claims, and that those claims met the statutory requirements of patentability. Upon information and belief, however, the Applicants, including Robert Arnott, knew before the issuance of the Patents-in-Suit that Robert C. Jones and GSAM had constructed an index based on a factor other than price (*i.e.*, the Earnings-Weighted Index and Fund).

187. At least Mr. Arnott breached his duty of candor and good faith with intent to deceive the US PTO by failing to disclose Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund. Additional facts about the intent of Robert Arnott to deceive the USPTO are believed to be in the exclusive control of Research Affiliates and its attorneys and cannot be reasonably known to Defendants without discovery.

188. But for Robert Arnott's failure to disclose Robert C. Jones' Earnings-Weighted Index and GSAM's Earnings-Weighted Index Fund to the USPTO, at least claims 1-4, 15, 18-20, 23, 31, 33-34, 38-41, 49 and 52-55 of the '502 Patent; claims 1 and 34-36 of the '719 Paten; and claims 1, 6, 8, 10, 23-25 and 73 of the '740 Patent would not have issued or been allowed by the USPTO.

189. In sum, on information and belief, at least claims 1-4, 15, 18-20, 23, 31, 33-34, 38-41, 49 and 52-55 of the '502 Patent; claims 1 and 34-36 of the '719 Patent; and claims 1, 6, 8, 10, 23-25 and 73 of the '740 Patent would not have been issued or allowed but for Robert Arnott's foregoing material misrepresentations and omissions, and Robert Arnott made each of the foregoing misrepresentations and omissions with a specific intent to deceive the USPTO.

The Patents-in-Suit are Unenforceable Due to Intentional False Statements and Egregious Misconduct Concerning False Claims of Joint Inventorship

190. At least Robert Arnott, founder of Research Affiliates LLC ("RA") and its patent attorney, Ralph Albrecht, engaged in affirmative, egregious misconduct and inequitable conduct during the prosecution of the applications for the '502 Patent, the '740 Patent and U.S. Patent No. 7,620,577 (the "'577 patent") that renders at least the '502 Patent and the '740 Patent and each of their claims unenforceable. In particular, during the prosecution of the '502, '740 and '577 patents Robert Arnott and Ralph Albrecht knowingly and intentionally falsely represented in the application for the '577 patent that Robert Arnott and Paul Wood were joint inventors of the subject matter disclosed and claimed therein. That misrepresentation was perpetuated when the applications for the '502 and '740 patents asserted priority to the '577 patent.

191. On or about June 3, 2002, U.S. Pat. Application No. 10/159,610 (the "'610 Application") was filed in the USPTO by Paul Wood. It was entitled "Fundamental Stock Market Index and Index Fund or Funds".

192. Paul Wood was the only named inventor on the '610 Application.

193. At the time he filed the '610 Application in 2002, Paul Wood was unaware of any work by Robert Arnott on subject matter disclosed in the '610 Application.

194. At the time Paul Wood filed the '610 Application in 2002, Robert Arnott was unaware that Paul Wood had filed that patent application.

195. At the time Paul Wood filed the '610 Application in 2002, Robert Arnott was unaware of any work by Paul Wood on subject matter disclosed in the '610 Application.

196. On or about May 24, 2002, Paul Wood executed a sworn declaration that was filed with the USPTO during the prosecution of the '610 Application

stating that he was the "original and first inventor of the subject matter" of that which was claimed in the '610 Application.

197. Robert Arnott did not invent any of the subject matter disclosed in the '610 Application.

198. Robert Arnott and Paul Wood did not collaborate on the invention of any of the subject matter disclosed in the '610 Application.

199. Robert Arnott and Paul Wood were not joint inventors with respect to any of the subject matter disclosed in the '610 Application.

200. On information and belief, as of June 3, 2002, the time the '610 Application was filed, Robert Arnott and Paul Wood had never spoken to each other or collaborated in any way with each other.

201. Paul Wood was the first to file a patent application in the United States directed to "fundamental indexes."

202. Paul Wood's '610 Application described using fundamental factors to not only weight the stocks in a fundamental index, but he also described using fundamental factors to **select** the stocks in the first place. (See 610 App., June 3, 2002 at para [009]).

203. On or about October 12, 2004, U.S. Pat. Application No. 10/961,404 (the "'404 Application") was filed in the USPTO. It was entitled "Valuation Indifferent Non-Capitalization Weighted Index."

204. Robert Arnott was named as the sole inventor of the subject matter of the '404 Application.

205. Ralph Albrecht, a patent attorney, was substantively involved in the prosecution of the '404 Application on behalf of Research Affiliates and Robert Arnott.

206. On or about March 5, 2005, Robert Arnott executed a declaration that was filed with the USPTO during the prosecution of the '404 Application stating that he was the "original and sole inventor … of the subject matter" claimed in the

'404 Application. In that declaration, Robert Arnott acknowledged his duty of candor and good faith to the USPTO.

207. Robert Arnott and Paul Wood did not collaborate on the invention of any subject matter disclosed in the '404 Application.

208. Robert Arnott and Paul Wood were not joint inventors or co-inventors of any of the subject matter claimed in the '404 Application.

209. On information and belief, as of the time the '404 Application was filed Robert Arnott and Paul Wood had never spoken to each other.

210. Robert Arnott's '404 Application described using fundamental factors to weight the stocks in a fundamental index, but failed to describe selecting the stocks using fundamental factors.

211. On or about January 18, 2005, Paul Wood assigned his '610 Application to Research Affiliates.

212. At the time of the assignment of Paul Wood's patent application to Research Affiliates, Robert Arnott was aware of the assignment of the '610 Application.

213. At the time of the assignment of Paul Wood's patent application to Research Affiliates, Robert Arnott was aware that he was not an inventor of the subject matter disclosed and/or claimed in the '610 Application.

214. At the time of the assignment of Paul Wood's patent application to Research Affiliates, Robert Arnott was aware that he did not collaborate with Paul Wood on any of the subject matter disclosed and/or claimed in the '610 Application.

215. On or about January 18, 2005, Ralph Albrecht became aware of the subject matter disclosed and claimed in the '610 Application. At that time, he knew that the subject matter disclosed and claimed in the '610 Application was not invented by Robert Arnott, and that Robert Arnott had not collaborated with Paul Wood on any of the subject matter disclosed and/or claimed in the '610 Application.