FRAUD ON THE MARKET: ANALYSIS OF THE EFFICIENCY OF THE CORPORATE BOND MARKET†

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The efficiency of the corporate bond market is not well understood. Although many of the factors used to analyze stock market efficiency translate with some adjustments to corporate bond markets, the cause-effect factor is not intuitive and can be a source of significant confusion. In this paper we analyze bond market efficiency in the context of a recent court decision concerning allegations of securities fraud perpetrated by the American International Group ("AIG"). The decision turned on an empirical analysis of whether certain AIG bonds traded in open, developed, and efficient markets. The court found insufficient empirical evidence to hold that the $1.71 billion in AIG bonds, issued by the world's largest

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insurance company, traded in open, developed, and efficient markets. If the market for these bonds had been found efficient, there would have been grounds to certify the bondholders as a class. Unfortunately, the AIG court missed salient differences between the stock and bond markets in reaching its conclusion. Our paper describes the analysis missed by the court and supports a contrary result. The AIG decision has serious implications not only for the corporate bond market but also for public policy. When market efficiency is important for determining certification of a class of security holders, it is critical that courts carefully consider how different markets operate.

I. INTRODUCTION

The efficiency of the corporate bond market is not well understood. Although many of the factors used to analyze stock market efficiency translate with some adjustments to corporate bond markets, the cause-effect factor is not intuitive and can be a source of significant confusion. In this paper we analyze bond market efficiency in the context of a recent court decision.

In *In re American International Group, Inc. Securities Litigation* (*AIG*), the lead plaintiffs asked a U.S. district court to certify a class with claims against American International Group ("AIG") and various other defendants for numerous violations of the securities laws.[1] The gist of the lead plaintiffs' claims was that the defendants made material misstatements and omissions in AIG's financial statements, causing artificial inflation of the valuation of AIG's financial assets.[2] Investors who purchased the securities at the allegedly inflated prices claimed to be harmed when the prices fell upon revelation of the omissions and misstatements.[3] The court certified a class of equity holders but denied the lead plaintiffs' request for certification of a class of AIG bondholders.[4]

The *AIG* court denied class certification to these bondholders because it was not convinced that the bonds traded in an open, developed, and efficient market. This finding was based on the *AIG* court's application of empirical tests initially articulated for equity markets by the district court in *Cammer v. Bloom*,[5] and expanded by other court decisions.[6] These courts have listed a series of factors

[1] 265 F.R.D. 157, 161 (S.D.N.Y. 2010).

[2] *Id.* at 160.

[3] *Id.* at 163, 173.

[4] *Id.* at 189.

[5] 711 F. Supp. 1264 (D.N.J. 1989).

[6] *See infra* notes 44–55 and accompanying text.

relevant for determining the efficiency of equity markets.[7] The *AIG* court applied the same factors in rendering its decision regarding the efficiency of the market for the AIG bonds, without properly adjusting the factors to account for distinctions between the stock and bond markets. Had the court found sufficient evidence to support a conclusion that the AIG bonds traded in an efficient market, there would likely have been common issues of law or fact justifying class certification.

The court's holding that there was insufficient evidence to support a conclusion that $1.71 billion in AIG bonds, traded in an open, developed and efficient market, has serious implications for the corporate bond market.[8] Throughout the Class Period[9] AIG was the world's largest insurance company, with over $100 billion in revenues, $850 billion in assets, $85 billion in shareholders' equity, and $750 billion in debt and other liabilities, as well as listings on three international exchanges—the New York Stock Exchange ("NYSE"), the Tokyo Stock Exchange and the Irish Stock Exchange—and service provided to over sixty million customers.[10] On the basis of the empirical evidence the *AIG* court relied upon in its finding that the company's bonds did not trade in an open, developed, and efficient market, the *AIG* court's decision raises the question whether, based on this precedent, a court could find that *any* corporate bonds trade in open, developed, and efficient markets. At best, the court's decision denies AIG bondholders an opportunity to evaluate the merits of their claims and prove their damages, as a class, in court. At worst, it effectively precludes investors in the $7.4 trillion corporate bond market[11] from

[7] *Cammer*, 711 F. Supp. at 1286–87.

[8] *AIG*, 265 F.R.D. at 180–81.

[9] The Class Period is defined as the period beginning on October 28, 1999 and ending on April 1, 2005. *Id.* at 160, 189.

[10] Am. Int'l Group, Inc., Annual Report Pursuant to Section 13 or 15(D) of the Securities Exchange Act of 1934 (Form 10-K) (Mar. 16, 2006).

[11] Note that the bond market is only slightly smaller in size than the United States Treasury Market of $8.9 trillion. *See* SEC. INDUS. & FIN. MKTS. ASS'N, OUTSTANDING U.S. BOND MKT. DEBT, http://www.sifma.

utilizing class actions as a means to recover legitimate economic losses. An ancillary consequence of this decision is that additional risks will be transferred from issuers to investors[12] should bondholders be denied class certification and thus have no practical recourse for recovery of legitimate claims. Without legal recourse there likely will be an increase in the costs of capital for bond issuers.[13]

As analyzed below, the decision turned on an evaluation of whether the bond market in which the AIG bonds traded is open, developed, and efficient.[14] Unfortunately, in determining that the bonds were not traded in an open, developed, and efficient market, and thus not finding "questions of law or fact common"[15] to the class of bondholders, the court failed to sufficiently adjust the analysis of factors commonly used for determining whether

org/uploadedFiles/Research/Statistics/StatisticsFiles/CM-US-Bond-Market-Outstanding-SIFMA.xls (last updated Dec. 16, 2010).

[12] *See* Clifford W. Smith, Jr., *On Financial Contracting: An Analysis of Bond Covenants*, 7 J. FIN. ECON. 117 (1979).

[13] "If the probability of a complete wealth transfer to stockholders prior to required payments to bondholders is 1, then the bonds will sell for a zero price." *Id.* at 119 n.5.

[14] *AIG*, 265 F.R.D. at 175–76 (adopting "the *Cammer* factors as a framework"). The *Cammer* court noted:

> An open market is one in which anyone, or at least a large number of persons, can buy or sell. A developed market is one which has a relatively high level of activity and frequency, and for which trading information (e.g., price and volume) is widely available. It is principally a secondary market in outstanding securities. It usually, but not necessarily, has continuity and liquidity (the ability to absorb a reasonable amount of trading with relatively small price changes). An efficient market is one which rapidly reflects new information in price. These terms are cumulative in the sense that a developed market will almost always be an open one. And an efficient market will almost invariably be a developed one.

Cammer v. Bloom, 711 F. Supp. 1264, 1276 n.17 (D.N.J. 1989) (quoting 4 ALAN R. BROMBERG & LEWIS D. LOWENFELS, SECURITIES FRAUD AND COMMODITIES FRAUD, § 8.6 (1988)).

[15] *AIG*, 265 F.R.D. at 172.

common stock is traded in an efficient market to account for the trading of corporate bonds. This paper proposes a comprehensive analysis that takes into account the differences between the stock and bond markets, which also can be applied to other types of securities. Specifically, the factors courts have found indicative of an efficient stock market—frequency of ownership turnover,[16] analyst reporting,[17] and price-related issues associated with cause-and-effect[18]—must be adjusted to take into account the nuances of the bond market. Our analysis of these factors lends support to a conclusion, contrary to that reached by the *AIG* court, that the AIG bonds indeed traded in open, developed, and efficient markets and that certification of a class of bondholders pursuing claims for material misleading statements and omissions would have been warranted.[19]

To address these issues, this paper is organized as follows. Part I provides an overview of the law as it has developed regarding certification of class actions and the elements of a claim of fraud on the market as relevant to the lead plaintiffs' claims of violations of the securities laws. Part II introduces the required empirical analysis and benchmarks to evaluate a claim of fraud on the market. Part III continues with a theoretical discussion of the distinctions missing in the *AIG* analysis between bonds and stocks relevant to determining whether the bond market should be afforded the fraud on the market presumption. Part IV builds on this with a discussion of our alternate empirical analyses. Part V summarizes our conclusions.

II. SECURITIES CLASS ACTIONS AND FRAUD ON THE MARKET

The AIG litigation involved the request for class certification by Ohio Public Employees Retirement System,

[16] *Cammer,* 711 F. Supp. at 1286.

[17] *Id.*

[18] *Id.* at 1287.

[19] The authors are not making any assertions regarding liability and materiality of the AIG bondholders' claims.

State Teachers Retirement System of Ohio, and the Ohio Police & Fire Pension Fund (collectively, "Lead Plaintiffs") against AIG, Maurice "Hank" Greenberg—AIG's former Chief Executive Officer and Chairman—the firm's outside auditors and other corporations and individuals (collectively, "Defendants").[20] After making a number of modifications to the definition of the class, the court granted class certification to the stockholders, but denied class certification to the AIG bondholders.[21]

The first question that the court addressed in evaluating the bondholders' claims was whether they had standing. Although the court found that the bondholders did not have standing to bring some of their claims—the Sections 11[22] and 15[23] claims under the Securities Act of 1933[24]—it found standing for their Securities Exchange Act Section 10(b)[25] and Securities and Exchange Commission ("SEC") Rule 10b-5[26] claims. It was thus the Section 10(b) and Rule 10b-5 claims for which the court considered whether class certification of the bondholders would be appropriate.[27]

Rule 23 of the Federal Rules of Civil Procedure[28] outlines the requirements for class certification.[29] The salient missing element with respect to the proposed class of bondholders in the AIG litigation involved the requirement of Rule 23(b)(3) that "questions of law or fact common to class members predominate over any questions affecting only

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[20] *AIG*, 265 F.R.D. at 160–61.

[21] Claims against the defendants Wachovia Securities, Merrill Lynch, Gen Re, Ferguson, Houldsworth, and Naples were also dismissed. *Id.* at 161, 189.

[22] Securities Act of 1933 § 11, codified at 15 U.S.C. § 77a (2010).

[23] Securities Act of 1933 § 15, codified at 15 U.S.C. § 77b (2010).

[24] *AIG*, 265 F.R.D. at 189.

[25] *Id.* at 157–66; Securities Exchange Act § 10(b), codified at 15 U.S.C. § 78a (2010).

[26] *AIG*, 265 F.R.D. at 157–66; SEC Rule 10b-5, 17 C.F.R. § 240.10b-5 (2010).

[27] *AIG*, 265 F.R.D. at 167.

[28] FED. R. CIV. P. 23.

[29] *AIG*, 265 F.R.D. at 157–66.

individual members."[30] As the *AIG* court explained the rule, the "predominance requirement is met 'if the plaintiff can establish that the issues in the class action that are subject to generalized proof, and thus are applicable to the class as a whole . . . predominate over the issues that are subject only to individualized proof.'"[31]

A significant part of the analysis in *AIG* for determining whether the predominance requirement was met involved whether common issues of "reliance on the integrity of the price set by the market"[32]existed. In order to establish that common issues of reliance predominated, the court found it necessary for the Lead Plaintiffs "to meet the requirements of the fraud on the market presumption"[33] as described by the U.S. Supreme Court in *Basic, Inc. v. Levinson.*[34] According to *Basic,* "the fraud on the market theory is based on the hypothesis that, in an open and developed securities market, the price of a company's stock is determined by the available material information regarding the company and its business .... Misleading statements will therefore defraud purchasers of stock even if the purchasers do not directly rely on the misstatements."[35]

The *AIG* court further cited the Second Circuit Court of Appeals opinion in *In re Salomon Analyst Metromedia Litigation,*[36] where the court explained *Basic* as follows: "The *Basic* court thereby set forth a test of general applicability that where a defendant has (1) publicly made (2) a material misrepresentation (3) about stock traded on an impersonal, well-developed (i.e. efficient) market, investors' reliance on those misrepresentations may be presumed."[37]

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[30] *Id.* at 172 (citing FED. R. CIV. P. 23(b)(3)).

[31] *Id.* (quoting Cordes & Co. Fin. Servs., Inc. v. A.G. Edwards & Sons, Inc., 502 F.3d 91, 108–09 (2d Cir. 2007)).

[32] *Id.* at 172, 173–74 (quoting Basic, Inc. v. Levinson, 485 U.S. 224, 245 (1988)).

[33] *Id.* at 174.

[34] 485 U.S. 224 (1988).

[35] *Id.* at 241–42.

[36] 544 F.3d 474 (2d Cir. 2008).

[37] *AIG,* 265 F.R.D. at 174 (quoting *Salomon,* 544 F.3d at 481).

An integral part of the court's analysis, then, was its determination of whether the securities held by the bondholders traded in an efficient market. In *Cammer v. Bloom*,[38] the district court detailed a five-factor test for determining the efficiency of equity markets.[39] The *AIG* court identified the following factors, emanating from those identified by *Cammer,* as important for establishing that stocks are traded in an efficient market:

> (1) a large weekly trading volume;
>
> (2) a significant number of securities analysts following and reporting on a company's stock;
>
> (3) the presence of market makers and arbitrageurs who are able to react swiftly to company news and drive the price;
>
> (4) the eligibility of the company to file an S-3 Registration Statement for its public offerings; and
>
> (5) empirical facts showing a cause and effect relationship between unexpected corporate events or financial releases and an immediate response in the stock price.[40]

Though recognizing that the Second Circuit has not adopted a test to determine whether bonds have been traded in an efficient market, the *AIG* court noted that Second Circuit courts often apply the factors listed by the *Cammer* court in cases involving common stock[41] and that these factors may be used as an analytical tool in litigation involving bonds.[42] The *AIG* court then analyzed the efficiency of the AIG bond market, using these factors as a

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[38] 711 F. Supp. 1264 (D.N.J. 1989).

[39] *Id.* at 1286–87.

[40] *AIG,* 265 F.R.D. at 176 (quoting *In re* SCOR Holding (Switz.) AG Litig., 537 F. Supp. 2d 556, 574 (S.D.N.Y. 2008) (citing *Cammer*, 711 F. Supp. at 1286-87)).

[41] *Id.* at 175.

[42] *Id.* at 175–76 (citing Teamsters Local 445 Freight Div. Pension Fund v. Bombardier Inc., 546 F.3d 196, 204 n.11 (2d Cir. 2008)).

framework while also considering other evidence it found relevant to the efficiency of the bond market.[43]

III. EMPIRICAL ANALYSIS AND BENCHMARKS

To certify an investor class in Section 10 and Rule 10b-5 securities litigation the federal courts have relied for almost twenty years on the *Cammer* court's list of factors as a framework for determining whether securities traded in open, developed, and efficient markets, with various modifications.[44] The factors articulated by the court in *Cammer*, as expanded, enhanced, and modified by courts throughout the years, are referred to herein, collectively, as the *Cammer* factors. These factors can be separated into two general categories: operational factors and price-related factors. The operational factors include a determination of whether:

> (1) there was high average weekly turnover of the securities;[45]
>
> (2) there was continuous coverage of the securities by investment professionals, along with regular disclosures by the company;[46]

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[43] *Id.* at 176.

[44] *See, e.g.*, Freeman v. Laventhol & Horwath, 915 F.2d 193, 199 (6th Cir. 1990); *In re* HealthSouth Corp. Sec. Litig., 257 F.R.D. 260, 280–82 (N.D. Ala. 2009); *In re* DVI Inc. Sec. Litig., 249 F.R.D. 196, 208 (E.D. Pa. 2008), *aff'd*, 639 F.3d 623 (3d Cir. 2011); *In re* PolyMedica Corp. Sec. Litig., 453 F. Supp. 2d 260, 265–66 (D. Mass. 2006); *In re* Enron Corp. Sec., Derivative & "ERISA" Litig., 529 F. Supp. 2d 644, 692–94 (S.D. Tex. 2006); AAL High Yield Bond Fund v. Ruttenberg, 229 F.R.D. 676, 683–85 (N.D. Ala. 2005); Krogman v. Sterrit, 202 F.R.D. 467, 474 (N.D. Tex. 2001).

[45] Weekly trading volume has been called possibly "one of the most important" of the *Cammer* factors. *PolyMedica*, 453 F. Supp. 2d at 266 (quoting *Krogman*, 202 F.R.D. at 474).

[46] *See In re* Xcelera.com Sec. Litig., 430 F.3d 503, 514 (1st Cir. 2005) ("[T]he greater the number of securities analysts following and reporting on a company's stock, the greater the likelihood that information released by a company is being relied upon by investors.").

(3) there were a relatively high number of market makers or dealers of the securities, along with arbitrageurs;[47]

(4) the securities were eligible to file on SEC Form-S-3 and to incorporate by reference on SEC Form S-4;[48]

(5) there was a relatively large cumulative face value of the securities;[49]

(6) there was a relatively large proportion of institutional holdings of the securities;[50]

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[47] *See Polymedica*, 453 F. Supp. 2d at 267–68 ("The existence of market makers and arbitrageurs would ensure completion of the market mechanism; these individuals would react swiftly to company news and reported financial results by buying or selling stock and driving it to a changed price level.") (quoting Cammer v. Bloom, 711 F. Supp. 1264, 1286–87 (D.N.J. 1989)). Furthermore, according to *PolyMedica*, "[a] market-maker is '[o]ne who helps establish a market for securities by reporting bid-and-asked quotations' (the price a buyer will pay for a security and the price a seller will sell a security) . . . . A market-maker also 'stand[s] ready to buy or sell at these publicly quoted prices.'" *Id.* at 268 (citations omitted).

[48] To be eligible to file a Form S-3 registration statement an issuer of securities must: (1) have been filing reports under the Securities Exchange Act of 1934 for twelve months; and (2) in cases where the issuer is undertaking a new offering of equity securities, the market value of its publicly-held voting stock must be at least $75 million. THOMAS LEE HAZEN, SECURITIES REGULATION 160 (7th ed. 2006). *See also Cammer*, 711 F. Supp. at 1271 n.5 ("Generally speaking, it is the largest and most well known companies which register equity securities on Form S-3".); *id.* at 1284 ("This form [S-3] is predicated on the Commission's belief that the market operates efficiently for these companies, i.e., that the disclosure in Exchange Act reports and other communications by the registrant, such as press releases, has already been disseminated and accounted for by the market place." (citing SEC Securities Act Release No. 6331, 27 C.F.R. § 239 (1981)); U.S. SECURITIES AND EXCHANGE COMMISSION, OMB NO. 3235-0073, FORM S-3, *available at* http://www.sec.gov/about/forms/secforms.htm; U.S. SECURITIES AND EXCHANGE COMMISSION, OMB NO. 3235-0324, FORM S-4, *available at* http://www.sec.gov/about/forms/secforms.htm.

[49] *See Krogman*, 202 F.R.D. at 478 ("Market capitalization, calculated as the number of shares multiplied by the prevailing share price, may be an indicator of market efficiency because there is a greater incentive for stock purchasers to invest in more highly capitalized corporations.").

> (7) there were opportunities for arbitrage, supported by evidence that short selling was available at reasonable borrowing rates or there were few observed violations in put-call parity;[51]
>
> (8) there was a reasonably small bid-ask spread;[52] and
>
> (9) there was a sufficiently large float (i.e., the amount of outstanding securities that are not held by insiders of the corporation).[53]

Price-related factors include a determination of:

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[50] For example, in *In re Enron Corp. Securities Derivative & "ERISA" Litigation*, the court decided that the Enron bonds traded in efficient markets partially based on:

> data on institutional holdings demonstrat[ing] that from 20 to 115 institutions held Enron bonds during any quarter end during the Class Period (65 on average, a median of 65). Total holdings for all reporting institutions at a quarter-end during the Class Period ranged from 2.7% of face value to 93% of face value per issue (45% on average, a median of 49%). The total reported increases in holdings for quarters in the Class Period (Q4-98 through Q4-01) as a percentage of issue amount ranged from 12% to 137% per issue (77% on average, a median of 69%). Thus, there was active trading in Enron Registered Bonds throughout the Class Period, [and] there were a substantial number of institutional investors.

529 F. Supp. 2d 644, 756 (S.D. Tex. 2006).

[51] *See PolyMedica*, 453 F. Supp. 2d at 273 ("This Court rejects the assertion that arbitrage is the *only* mechanism of information efficiency, but accepts that the significant role of arbitrageurs toward that end is widely acknowledged in academic commentary—including sources cited by the First Circuit in *PolyMedica*.").

[52] *See Krogman*, 202 F.R.D. at 478 ("A large bid-ask spread is indicative of an inefficient market, because it suggests that the stock is too expensive to trade.").

[53] Insiders cannot freely trade in the stock of their firm based on their privileged, nonpublic information. They are subject to both trading restrictions (blackout periods, and restrictions of Rule 10b-5 and the Securities and Exchange Act of 1934 §§ 16(b) and 16(c)), as well as the reporting requirements of § 16(a). *See* 17 C.F.R. § 240.10b-5 (2010); 15 U.S.C. §§ 78p(b), 78p(c), 78p(a) (2010).

> (1) whether there was a rapid price reaction to new information relevant to the valuation of these securities;[54] and
>
> (2) whether there were certain statistical properties of price or yield movements, such as the lack of autocorrelation.[55]

The criteria outlined by various courts addressing whether a particular securities market is open, developed, and efficient have generally been used to examine a corporation's common stock and thus require adjustment when the securities market at issue is a corporate bond market. Unfortunately, in *AIG*, both the economic and legal analyses failed to account for the critical differences between the functioning and performance of common stock markets versus corporate bond markets. Specifically, it is necessary to further evaluate the AIG bonds' rate of turnover,[56] the coverage by investment professionals,[57] and the speed of the reaction in the bond market to new information about AIG in order to determine whether the company's bonds traded in

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[54] *See PolyMedica*, 453 F. Supp. 2d at 271 ("In other words, for a market to be efficient, the response of a stock's price to news must be made completely (i.e., have reached a new equilibrium) before an 'ordinary investor' can earn a trading profit based upon it.").

[55] "Autocorrelation is usually found in time-series data. Economic time-series often displays a 'memory' in that variation is not independent from one period to the next." WILLIAM H. GREENE, ECONOMETRIC ANALYSIS 358 (2d ed. 1993). In other words, autocorrelation is the measurement of the relationship between the security return at time t and the return of the same security at some fixed time in the past. First-order autocorrelation would be found when there is a statistically significant relationship between the bond return today and the bond return yesterday. Another way of looking at this concept is that if an observer can use the return from yesterday to predict with some level of certainty the return today there exists autocorrelation. *See* Lehocky v. Tidel Techs., Inc., 220 F.R.D. 491, 505 n.15, 506 n.18, 506 n.20 (S.D. Tex. 2004) (noting that both parties' experts agreed on the helpfulness of autocorrelation); *PolyMedica*, 453 F. Supp. 2d at 276–78.

[56] *AIG*, 265 F.R.D. 157, 176–77 (S.D.N.Y. 2010) (describing the trading frequency of the AIG Debt Securities).

[57] *Id.* at 177.

an efficient market.[58] Furthermore, close examination of these factors sheds light on the differences between the trading of stocks and bonds. The *AIG* court instead focused on the alleged lack of transparency of the bond market.[59] Transparency in securities markets suggests that price and volume information is readily available at low cost to most, if not all, traders. In equity markets, increased transparency plays a greater role because typical trades are between small retail investors and have transaction sizes of a few thousand dollars.[60] Thus the costs to observe price and volume information must be kept low. In the bond markets, where most trades are between sophisticated institutional traders and the transaction size is often more than one million dollars, transparency plays a reduced role.[61] In bond markets, sophisticated institutional traders use basic communication (e.g., computers, telephones, email, etc.) to generate market transparency about prices and order flow, even though this information is more costly to obtain and not always freely available. The *AIG* court missed this important distinction between equity and bond markets. To more fully address how the bond market differs from the stock market, Part IV provides a brief primer on corporate bonds, followed in Part V by the bond market analysis missing in *AIG*.

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[58] *Id.* at 178–79.

[59] *Id.* at 179.

[60] According to the NYSE Factbook, in 2010, total dollar trading volume equaled $11.968 trillion for a total of 1.481 billion trades, giving an average transaction size of $8,078. *See* DAILY NYSE GROUP VOLUME IN NYSE LISTED, 2010, (data for 2010 appears below the table for 2011 year-to-date Group Volume), http://www.nyxdata.com/nysedata/asp/factbook/viewer_edition.asp?mode=table&key=3141&category=3 (last visited on Dec. 1, 2011).

[61] For example, the average par value per transaction was approximately $600,000 for the 0.5% Cash Exchangeable Equity-Linked Senior Notes and approximately $3.0 million for the Zero-Coupon Convertible Senior Debentures. *See* Declaration of John D. Finnerty, Ph.D., in Support of Lead Plaintiffs' Motion for Class Certification at ¶ 62, *AIG*, 265 F.R.D. 157 [hereinafter Finnerty Declaration] (S.D.N.Y. 2010) (No. 04 Civ. 8141 (DAB)).

IV. FRAUD ON THE MARKET: STOCKS VS. BONDS AND THE MISSING THEORETICAL ANALYSIS

A. The Corporate Bond Market

A corporate bond is a security issued in connection with a corporation's borrowing activity. The borrower (the corporation) receives a lump sum payment in return for a promise to make periodic payments to the lender in the future. These periodic payments typically include semiannual payments of interest to lenders (called coupon payments), as well as a lump sum payment at maturity (called a principal payment).[62]

After the corporate bonds are issued, investors can, if they wish, buy and sell the bonds in the secondary market. If the corporate bonds are not registered with the SEC, trading can only take place based on applicable SEC rules. Under SEC Rule 144A, unregistered securities may only be bought and sold by Qualified Institutional Buyers.[63] If, however, the bonds are registered with the SEC, any investor may buy or sell bonds in the secondary market.

Even so, for registered corporate bonds, the market is primarily composed of institutional traders. Furthermore, most transactions take place over-the-counter, where the potential bond trader cannot observe quotes on a centralized or electronic exchange.[64] Instead, the institution or customer

[62] Corporate bonds frequently have covenants or terms whereby the bond may be put to the company by the investor or called by the company. They can be convertible and/or secured by assets.

[63] SEC Rule 144A(a) defines a Qualified Institutional Buyer as any institution that manages at least $100 million in securities, including banks, savings and loans institutions, insurance companies, investment companies, employee benefit plans, or an entity owned entirely by qualified investors. Also included are registered broker-dealers owning and investing, on a discretionary basis, $10 million in securities of non-affiliates. 17 C.F.R. §§ 230, 144A(a)(1) (2010).

[64] Corporate bonds also trade on the New York Stock Exchange, a centralized exchange where there are readily available price quotes. Estimates suggest that only a small proportion of all corporate bond trades are made on the New York Stock Exchange. *See* Frank J. Fabozzi & Frank

must call one or more dealers for quotes or alternatively, have access to the broadcast list of bonds that are trading from various dealers for quotes through electronic platforms[65] such as Bloomberg, a vendor of quotes and financial information that is popular with institutions.[66]

B. Corporate Bond Prices and Price Movements

The price of bonds is calculated as the present value of the expected future cash flows they generate. In turn, the present value calculation depends upon the magnitude and timing of promised bond payments and the likelihood of repayment, as well as the market interest rates for comparable securities. The price of a fixed coupon bond is inversely related to its yield. This means that as bond prices fall, the yield rises.

Therefore both the price and yield[67] of corporate bonds are determined by six components[68]:

J. Jones, *The Primary and Secondary Bond Markets*, *in* THE HANDBOOK OF FIXED INCOME SECURITIES 31, 40 (Frank J. Fabozzi ed., 7th ed. 2005).

[65] *See id.*

[66] *See id.*

[67] The value of a bond with a fixed coupon is expressed as a price relative to $100 par value. This price relative to par value is inversely related to its yield. This means that as the bond price falls, the yield rises.

[68] The first three components of the value of a corporate bond are discussed in detail in Robert C. Merton, *On the Pricing of Corporate Debt: The Risk Structure of Interest Rates,* 29 J. FIN. 449, 450–55, 467–69 (1974). With respect to components (4) and (6), see, for example, Edwin Elton, Martin Gruber, Deepak Agrawal & Christopher Mann, *Factors Affecting the Valuation of Corporate Bonds*, 28 J. BANKING & FIN. 2747, 2756–59 (2004); Merton H. Miller, *Debt and Taxes*, 32 J. FIN. 261, 262–67 (1977); Merton Miller & Myron Scholes, *Dividends and Taxes*, 6 J. FIN. ECON. 333, 342–46 (1978); Harry DeAngelo & Ronald W. Masulis, *Leverage and Dividend Irrelevancy under Corporate and Personal Taxation*, 35 J. FIN. 453, 458–61 (1980). With respect to component (5), interest income from municipal bonds is free from federal taxation. *See* I.R.C. § 103(a) (2010). Thus, municipal bonds sell at lower yields (or higher prices) compared to similar risk, fully-taxable corporate bonds.

> (1) the expected rate of return on similar maturity, riskless debt (i.e., government or Treasury bonds);
>
> (2) the various covenants, provisions, and restrictions associated with the particular bond (e.g., call terms, convertibility features, seniority in the event of default, maturity date, etc.);
>
> (3) the default risk or the probability that the company will be unable to satisfy some or all of the indenture requirements given current and expected future economic conditions;
>
> (4) the likely recovery rate of the bonds in case of bankruptcy or liquidation given current and expected future economic conditions;
>
> (5) the tax considerations of the bond payments; and
>
> (6) the likelihood of being able to sell the corporate bond in a liquid market.

In an efficient market, changes in these factors will explain the variation in the prices and yields of corporate bonds. Generally, however, daily changes in corporate bond prices and yields are most often a function of only three of these factors: changes in risk-free Treasury rates of interest, changes in risk premiums for similar-risk corporate bonds, and changes in the company's likelihood of default on its obligations.[69] Most important, and key to any proper analysis of whether a debt security trades in an efficient market, is understanding that, all else constant, if firm-

[69] Typically, tax, recovery rate, and liquidity factors are stable day-to-day. Another variable that can affect the valuation of the bonds, the age of the bond, is deterministic (i.e., known in advance). Thus, while all of these factors affect bond prices, they will have only a small effect day-to-day. *See* Frank J. Fabozzi, *Bond Pricing, Yield Measures, and Total Return*, *in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 73; Bruce J. Feibel, *Calculating Investment Returns*, *in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 107; Frank J. Fabozzi, *The Structure of Interest Rates*, *in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 135.

specific disclosures do not alter the company's likelihood of default, bond pricing theory predicts that there will be little change in the price or yield of the bond.[70] In addition, bond pricing theory predicts that changes in risk-free interest rates or changes in risk premiums, say from an economy-wide shock, might cause a price reaction for a corporate bond. Thus, even without any new firm-specific information or change in the company's likelihood of default on its obligations, bond pricing theory predicts that there might be a price change due to changes in other factors.[71]

Although U.S. Government obligations are traditionally viewed as free from default risk, the same is not true for corporate bonds. Corporations can and do default on their promises to make future payments or otherwise abide by the bond indentures and covenants.[72] Bond default risk, also called credit risk, is measured by various rating agencies, such as Moody's Investors Service, Standard & Poor's Corporation, Duff & Phelps Corporation, and Fitch Ratings. Bonds are generally separated into two groups: investment-grade bonds, with Standard & Poor's ratings BBB- or higher, and speculative-grade bonds with ratings BB+ or lower.[73]

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[70] *See* Frank J. Fabozzi et al., *Corporate Bonds*, *in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 305.

[71] *See id.* Fama and French use regression analysis to attempt to adjust bond returns for these changes in risk-free rates and risk-premiums. *See* Eugene F. Fama & Kenneth R. French, *Common Risk Factors in the Returns on Stocks and Bonds*, 33 J. FIN. ECON. 3, 7 (1993).

[72] *See* Frank J. Fabozzi, *Credit Analysis for Corporate Bonds*, *in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 739; Tim Backshall et al., *Credit Risk Modeling*, *in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 779.

[73] Throughout the Class Period, the bond ratings for the AIG debt provided by Moody's Investors Service and Standard & Poor's were Aaa and AAA, respectively. For information on bond ratings, see STEPHEN A. ROSS, RANDOLPH W. WESTERFIELD & JEFFREY JAFFE, CORPORATE FINANCE 247–48 (9th ed. 2010); *see also* STANDARD & POOR'S, GUIDE TO CREDIT RATING ESSENTIALS 10–12 (2011), *available at* http://img.en25.com/Web/StandardandPoors/SP_CreditRatingsGuide.pdf.

Highly rated investment-grade bonds rarely default.[74] In other words, firms issuing investment-grade bonds have adequate cash flows to cover current interest and principal payment obligations and sufficient assets to back up the long-term payment obligations. The relative safety of the investment-grade bonds in effect separates the pricing of the investment-grade bonds (if they are not convertible or if the stock price is significantly below the conversion price for convertible bonds) from day-to-day stock price fluctuations of the issuing firm. Consequently, in efficient capital markets the price of investment-grade bonds is not very sensitive to day-to-day stock price fluctuations of the issuer, nor will it always react to corporate announcements.[75] Hence, in efficient capital markets, most of the variation in the prices of investment-grade bonds comes from fluctuations in economy-wide interest rates, as opposed to firm-specific information.[76]

Defaults on non-investment-grade, high-yield or speculative-grade bonds (also called junk bonds) are much more common. About half of all bonds that are rated CCC by Standard & Poor's have defaulted within ten years.[77] High-

[74] For A or higher-rated investment-grade bonds, default is rare, as demonstrated by a cumulative ten-year default rate of less than one percent. Hence, fewer than one out of 1,000 of the A or higher rated investment-grade bonds have defaulted in a given year. Nevertheless, some highly rated bonds have defaulted. In May 2001, WorldCom sold $11.8 billion of highly rated bonds. A year later, the firm filed for bankruptcy, and the bonds lost more than eighty percent of their investment value. For the lowest level of investment-grade bonds, the BBB-rated bonds, the cumulative default rate after ten years is around ten percent, or about one percent per year. Overall, investment-grade bonds are characterized by high interest coverage and low debt-to-capital ratios. *See, e.g.*, ROSS, WESTERFIELD & JAFFE, *supra* note 73, at 247–48.

[75] *See* Backshall et al., *supra* note 72.

[76] An investment-grade bond is assigned a rating in the top four categories by commercial credit rating companies. Standard & Poor's classifies investment-grade bonds as BBB or higher, and Moody's classifies investment-grade bonds as Baa or higher. *See* ROSS, WESTERFIELD & JAFFE, *supra* note 73, at 247–48.

[77] *See id.*

yield bonds, like investment-grade bonds, are sensitive to changes in interest rates and credit market conditions. In addition, high-yield bonds are sensitive to stock price behavior of the issuing firm and other firm-specific announcements.[78] Therefore, in efficient markets, we expect an issuer's news announcements that affect stock prices also to affect high-yield bond prices.

A hypothetical example will demonstrate how economic factors might differentially affect the prices of investment-grade and high-yield corporate bonds. Assume an investment-grade bond has a coupon of ten percent, it is priced in the market at its par value of $100, and it will be paid off at $100 in one year. All else constant, if the stock price of the issuer doubles, there will be little if any impact on the price of the investment-grade bond, because the maximum payoff at maturity is $100. If interest rates double to twenty percent, however, the value of the bond with its fixed coupon is reduced and the bond price will fall. Alternatively, a speculative-grade bond with a coupon of twenty percent, par value of $100, and a market price of $50 will react to both of these events. A doubling of interest rates to twenty percent will, like its effect on the investment-grade bond, cause downward pressure on the price of the speculative-grade bond. However, if the stock price doubles, signaling an increased likelihood that the bond will be redeemed at $100, then in an efficient market, bond-pricing theory predicts there will be upward pressure on the speculative-grade bond price.

This example also demonstrates an important observation about corporate bonds: investment-grade bond prices are expected to be sensitive only to bond pricing factors, such as risk-free interest rates, the default premium, and the term spread.[79] Speculative-grade bond prices are expected to be sensitive not only to these same bond pricing

[78] *See* Backshall et al., *supra* note 72.

[79] *See id.*

factors, but also to stock market pricing factors, such as stock returns for the underlying firm.[80]

C. The Impact of Corporate Bond Covenants on Price Movements

One must have a full understanding of the various covenants, provisions and restrictions associated with a particular bond (e.g., call terms, convertibility features, seniority in the event of default, maturity date, redemption terms, etc.) in order to evaluate properly the way bond prices react to new information. For example, assume there is a bond covenant that requires a full and immediate repayment of a corporation's debt in the event of a delay in the filing of any of the corporation's SEC reports. In an efficient market, an announcement by this corporation that it is delaying its SEC filing will likely be considered as negative news leading to a decline in the stock price. Because this same announcement would increase the likelihood that the corporation would have to redeem its debt immediately, the disclosure would be considered to be positive news to bondholders leading to an increase in the bond price.[81] Any observer not aware of this bond covenant will find the opposite movements of the stock and bond prices in response to the same news announcement to be anomalous. Hence, a meaningful analysis of bond market efficiency must account for this important factor—i.e., the covenant—in the determination of the bond's price movements.

The AIG bonds were convertible into AIG common stock. This means that AIG bondholders had the right to exchange their bonds for a preset number of shares of AIG stock. Covenants, such as conversion rights, can cause the bond prices to react in different ways than stock prices when there are firm-specific disclosures. Furthermore, covenants, such as conversion rights, can cause bond prices to react in different ways to firm-specific disclosures depending on the

[80] This dichotomy of variables that explain variations in bond prices is explained in Fama & French, *Common Risk Factors*, *supra* note 71.

[81] *See* Backshall et al., *supra* note 72.

level of stock prices. The magnitude of the price reaction associated with a firm-specific disclosure will differ depending on whether the bond's conversion option is said to be "in-the-money" or "out-of-the-money." The conversion option is in-the-money if the price of the stock is above the conversion price for the bonds. The conversion option is out-of-the-money if the price of the stock is below the conversion price for the bonds. In an efficient market, for bonds where the conversion option is in-the-money, bond pricing theory predicts a close, almost one-for-one relationship between bond and stock price movements.[82] For bonds whose conversion options are out-of-the-money, and especially for investment grade debt, bond pricing theory predicts that in an efficient market, firm-specific information will have little if any impact on the price of the bond, and there will be little relationship between stock and bond price movements.[83]

A hypothetical example will demonstrate how economic factors might differentially affect the prices of bonds where the conversion option is in-the-money versus out-of-the-money. Assume an investment-grade bond has a par value of $100 and a market price of $100, and is convertible into one share of common stock. This means that if the price of the common stock is above $100, the bond's conversion option is in-the-money. Thus, if the stock is trading at $120, bond pricing theory predicts that the bond will trade at or around $120, because the bondholders can convert each of their bonds into one share of stock valued at $120. In this case, if there were to be a disclosure of firm-specific information that led to a reduction in the stock price to $119, in an efficient market, bond pricing theory would predict that the bond price would also fall to about $119. Alternatively, when the stock is trading at $50 per share, this hypothetical bond's conversion option is out-of-the-

[82] *See* Chris P. Dialynas & John C. Ritchie, Jr., *Convertible Securities and their Investment Characteristics, in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 1371; Mihir Bhattacharya, *Convertible Securities and Their Valuation, in* THE HANDBOOK OF FIXED INCOME SECURITIES, *supra* note 64, at 1393.

[83] *See* Dialynas & Ritchie, *supra* note 82; Bhattacharya, *supra* note 82.

money. Thus, the same disclosure that causes a stock price reduction from $50 to $49 per share would not necessarily be expected to have any impact on the bond price in an efficient market. In fact, if the disclosure does not lead to a change in the likelihood of the company defaulting on its debt obligations, then in an efficient market, bond pricing theory would predict no change in the price of the bond.

D. Adjustments Required to Analyze Corporate Bonds

In general, in an efficient market, bond pricing theory predicts that, all else constant, the relationship between stock and bond price movements, and firm-specific disclosures, will be stronger as the stock price moves toward the conversion price—i.e., as the conversion option gets closer to being in-the-money. In other words, all else constant, bond pricing theory predicts that in an efficient market there will be a non-linear relationship between bond and stock returns.[84]

Other *Cammer* factors such as turnover also require some adjustments to translate properly from the stock market to the bond market. Corporate bonds will likely trade less frequently than stocks because outside macro-economic and internal financial factors generally both have smaller effects on bond pricing than on stock pricing.[85] Unlike common stocks, corporate bonds have predictable cash flows, predictable terminal values, fixed upside opportunities—namely, redemption at par value or $100 in our example—and a priority claim in a sale or liquidation of the corporation's assets. As such, many corporate bonds are

[84] A linear relationship suggests that as the stock price goes up by a certain percentage the bond price will, on average, go up by that percentage multiplied by some fixed constant. For example, if the multiplier is 0.50, then a linear relationship would imply that when the stock price goes up by ten percent, the expected bond price increase is five percent. As established above, the relationship between bond and stock price movements will not have a fixed linear relationship.

[85] *See* S. Edith Hotchkiss & Gergana Jostova, *Determinants of Corporate Bond Trading: A Comprehensive Analysis* 12–14 (July 9, 2007) (unpublished manuscript), *available at* http://ssrn.com/ abstract=1001459.

close substitutes for one another. This is especially true for AAA-rated bonds such as the AIG bonds. On the other hand, corporate equity does not have predictable cash flows, predictable terminal values, fixed upside opportunities, or priority on the corporate assets.[86] These critical differences in the characteristics of stocks and bonds lead to the differential influence of firm-specific and external economic factors. Thus, many fixed income investors tend to buy and hold bonds until maturity. Research has shown that few, if any, corporate bonds, (i.e., less than one percent) will trade each business day in a given calendar year.[87] A large proportion of corporate bonds (greater than forty percent) do not trade even once a year.[88] Less frequent trading does not by itself suggest the security trades in an inefficient market.

V. FRAUD ON THE MARKET: *AIG* AND THE MISSING EMPIRICAL ANALYSIS

A. Background Related to AIG Bonds

The Consolidated Third Amended Class Action Complaint brought in *AIG* describes five AIG bond offerings that took place between October 28, 1999, and April 1, 2005, (the

[86] *See In re* HealthSouth Corp. Sec. Litig., 261 F.R.D. 616, 631 (N.D. Ala. 2009) (noting that, after evaluating the differences between stocks and bonds, the court was "led to the conclusion that certainly some of those differences [in stocks] must be considered when evaluating the efficiency of a bond market").

[87] Sriketan Mahanti, Amrut Nashikkar, Marti Subrahmanyam, George Chacko & Gaurav Mallik, *Latent Liquidity: A New Measure of Liquidity, with an Application to Corporate Bonds*, 88 J. FIN. ECON. 272, 278 (2008).

[88] *Id.* at 281–82 ("For the median traded bond, the average time between trades varied between 12 days and 18 days within the sample period. (There are roughly twenty-two trading days in a calendar month). For the median stock, in comparison, this value is more on the order of minutes. For the most liquid stocks, this statistic is in seconds."). The authors also found that "[b]onds in the financial services industry (the banks and the other financial categories) traded the most during the sample period. This is not surprising because the financial services industry is the biggest issuer of corporate debt." *Id.* at 280.

"Class Period").[89] Four counts relating to the bond offerings were dismissed. The remaining count relating to bonds involved $210 million worth of 0.5% Cash Exchangeable Equity-Linked Senior Notes, due May 15, 2007, and issued on or about May 11, 2000, (0.5% Notes),[90] and $1.5 billion of Zero-Coupon Convertible Senior Debentures, due November 9, 2031, and issued on or about November 9, 2001, (Zero-Coupon Debentures).[91] The Zero-Coupon Debentures and the 0.5% Notes (collectively, the "AIG Debt Securities") are the primary focus of our analysis.

The AIG Debt Securities were rated AAA by Standard & Poor's throughout the Class Period, until March 30, 2005, when the rating dropped to AA+.[92] These securities were also simultaneously rated Aaa by Moody's until March 31, 2005, when the rating dropped to Aa1.[93] Therefore, the AIG Debt Securities were investment-grade throughout the Class Period. The observed patterns of trading prices of the AIG Debt Securities are consistent with investment grade fixed income securities. As shown in Figure 1 below, the 0.5% Notes traded at close to par value (or $100), while the price of the Zero-Coupon Debentures slowly increased over the relevant time period. This slow increase would be expected from a zero-coupon security where the yield does not come from a coupon payment, but from a capital gain.

In addition, Figures 1 and 2 also show that AIG's stock price varied substantially enough that the conversion options

[89] Consolidated Third Amended Class Action Complaint at 3, *AIG*, 265 F.R.D. 157 (S.D.N.Y. 2010) (No. 04 Civ. 8141 (DAB)).

[90] Am. Int'l Grp., Inc., Prospectus Supplement (Form 424B5) (Mar. 4, 2001); Consolidated Third Amended Class Action Complaint, *supra* note 89, at 56. *AIG,* 265 F.R.D. 157.

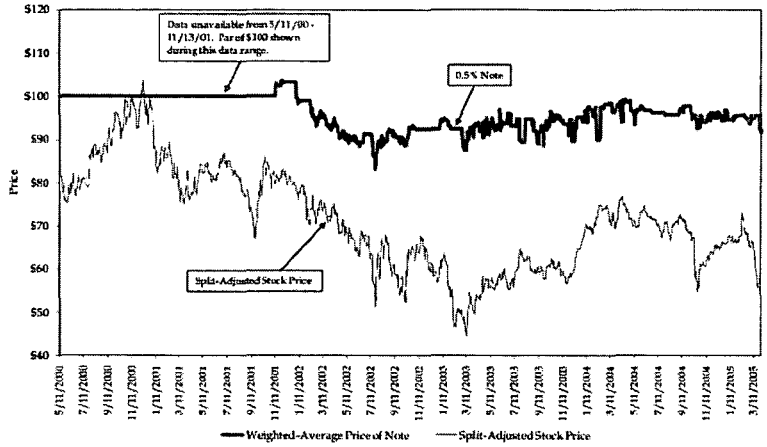
[91] *AIG*, 265 F.R.D. at 175 ("[B]ecause Lead Plaintiffs have standing for the § 10(b) and Rule 10b-5 bond claim, the Court must examine whether the members of the class can rely on the fraud-on-the-market presumption in bringing claims against AIG related to price decreases in its Zero-Coupon and 0.5% Debt Securities under Count Five of the Third Amended Complaint.").

[92] Finnerty Declaration, *supra* note 61, at ¶ 35.

[93] *Id.* at ¶ 36.

for the bonds would have also varied considerably. We discuss this further below in Section C.

FIGURE 1: AIG SPLIT-ADJUSTED STOCK PRICE VS. WEIGHTED-AVERAGE PRICE OF 0.5% NOTE[94]

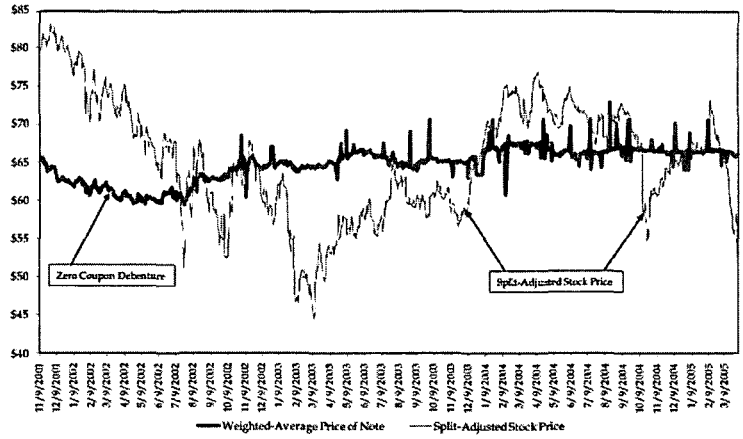


Source: Bloomberg and TRACE[95]

[94] CUSIP: 026874AN7.

[95] Bloomberg data is used for the 0.5% Note from May 11, 2000 to Feb. 28, 2003 (pricing data begins on Nov. 14, 2001). TRACE data for the 0.5% Note is used for Mar. 3, 2003 to Apr. 1, 2005.

FIGURE 2: AIG SPLIT-ADJUSTED STOCK PRICE VS. WEIGHTED-AVERAGE PRICE OF ZERO COUPON DEBENTURE[96]



Source: Bloomberg and TRACE[97]

B. Applying the *Cammer* Factors to the Bond Market

This section examines the important components of the operational and price-related *Cammer* factors and highlights the need for additional empirical analyses or background on bond pricing theory when differentiating between the stock and bond markets. The operational *Cammer* factors focus on the trading activity in the market and are primarily examined to answer the question of whether a security trades in an open and developed market.[98] An open capital market is one in which anyone can buy and sell securities.[99] A developed capital market is one that has a high level of trading activity, and for which trading information is readily

[96] CUSIP: 026874AP2.

[97] Bloomberg data is used for the Zero Coupon Debenture from Nov. 9, 2001 to June 28, 2002. TRACE data for the Debenture is used for July 1, 2002 to Apr. 1, 2005.Bloomberg data is used for the Zero Coupon Debenture from Nov. 9, 2001 to June 28, 2002. TRACE data for the Debenture is used for July 1, 2002 to Apr. 1, 2005.

[98] Cammer v. Bloom, 711 F. Supp. 1264, 1286–87 (D.N.J. 1989).

[99] *See* BROMBERG & LOWENFELS, *supra* note 14, at § 7.484.

available.[100] Developed capital markets are characterized as liquid markets that can absorb a reasonable amount of trading volume at relatively low trading costs.[101] The price-related *Cammer* factors are primarily used to examine whether the market price for a security rapidly reflects new information as would be expected in an open, developed, and efficient market.[102]

The first subsection below focuses on the operational *Cammer* factors of turnover or market activity followed by a discussion of transaction size and frequency in subsection two. In addition, because it is often confused with turnover, subsection three examines what economists call "transparency."[103] The *AIG* court[104] and some economists[105]

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[100] *Id.* ("A developed market is one which has a relatively high level of activity and frequency, and for which trading information (e.g., price and volume) is widely available. It is principally a secondary market in outstanding securities. It usually, but not necessarily, has continuity and liquidity (the ability to absorb a reasonable amount of trading with relatively small price changes).").

[101] According to Bromberg and Lowenfels, "An efficient market is one which rapidly reflects new information in price. These terms are cumulative in the sense that a developed market will almost always be an open one. And an efficient market will almost invariably be a developed one." *Id.*

[102] *Cammer,* 711 F. Supp. at 1291 ("[O]ne of the most convincing ways to demonstrate [market] efficiency would be to illustrate, over time, a cause and effect relationship between company disclosures and resulting movements in stock price."). *See also In re* Xcelera.com Sec. Litig., 430 F.3d 503, 511 (1st Cir. 2005) (citing *Cammer*, 711 F. Supp. at 1286–87); *In re* SCOR Holding (Switz.) AG Litig., 537 F. Supp. 2d 556, 574 (S.D.N.Y. 2008) (citing *Cammer*, 711 F. Supp. at 1286–87); Krogman v. Sterritt, 202 F.R.D. 467, 477 (N.D. Tex. 2001) ("In an efficient market, a stock's price remains relatively stable in the absence of news, and changes very rapidly as the market receives new and unexpected information.").

[103] *See* Amy K. Edwards, Lawrence E. Harris & Michael S. Pipowar, *Corporate Bond Market Transaction Costs and Transparency*, 62 J. FIN. 1421, 1422–23 (2007).

[104] *AIG*, 265 F.R.D. 157, 179 (S.D.N.Y. 2010).

[105] *See* FINANCIAL SERVICES AUTHORITY, TRADING TRANSPARENCY IN THE UK SECONDARY BOND MARKETS 6 (2005), *available at* http://www.fsa.gov.uk/pubs/discussion/dp05_05.pdf. ("[W]e also recognise that transparency should be viewed as a facilitator of market efficiency and

appear to rely on rhetorical arguments related to this ambiguous and undefined concept. Yet, this concept appears to be a straw man that, when used, virtually eliminates the possibility of certifying any bondholder class for the $7.4 trillion corporate bond market. Part B concludes with subsection four, which addresses analyst coverage and corporate bonds.

1. Turnover and Corporate Bonds

In his report and testimony, Lead Plaintiffs' expert witness opined, with regard to the AIG Debt Securities, that "[b]oth securities were actively traded."[106] He concluded, "Since bonds whose transactions are reported on TRACE tend to be liquid, the relatively high volume of trading is evidence that the markets for the Debt Securities were efficient during the Class Period."[107] The *AIG* court, however, disagreed and instead concluded that Lead Plaintiffs did not show "evidence of an efficient market based on volume of trading."[108] The court noted that the expert did not state his basis for opining that the AIG bonds have a large trading volume.[109]

Unfortunately, although turnover is arguably one of the most critical factors demonstrating whether a market is open and developed, no meaningful measure of turnover was

investor protection, not an end in itself. 'Maximum' transparency is not necessarily optimal.").

[106] Finnerty Declaration, *supra* note 61, at ¶ 62.

[107] *Id.* at ¶ 63.

[108] *AIG*, 265 F.R.D. at 177.

[109] *Id.* ("Although Dr. Finnerty has shown that the 0.5% and Zero-Coupon bonds trade at a higher average volume and in larger average dollar amounts than the majority of TRACE-reported bonds, this cannot support his claim that the AIG bonds trade in an efficient market without some further showing that these other bonds trade in an efficient market themselves. This Dr. Finnerty has not done. Nor has Dr. Finnerty compared the volume and value of trading in the AIG bonds to other securities for which studies or courts have found them to trade in efficient markets.").

presented to the court.[110] The *Cammer* court is clear that this is an important benchmark for determining market efficiency, stating that "average weekly trading of two percent or more of the outstanding shares would justify a strong presumption that the market for the security is an efficient one; one percent would justify a substantial presumption."[111]

A variety of turnover measures can be computed for each of the AIG Debt Securities. For example, utilizing information from the Defendants' expert report: "AIG estimates the daily trading volume of the Zero-Coupon Debentures between November 7, 2001 and November 9, 2006 was $12,156,000. AIG estimates the daily trading volume of the 0.5% Notes between May 8, 2000 and May 15, 2007 was approximately $11,000,334."[112] Based on these two estimates of trading volume of the AIG Debt Securities, the average weekly turnover for the Zero-Coupon Debentures and the 0.5% Notes can be calculated at approximately 4.1% and 26.2% per five-day week, respectively. If one conservatively assumes that these AIG estimates count both sides of each transaction—i.e., both seller and buyer activity—and thus represent double counting of transaction volume,[113] the estimates of turnover are still 2.0% and 13.1%, respectively. Moreover, these calculations represent the minimum levels because the estimates are based on market values of the bonds that traded rather than par values of $100 per bond. As shown in Figures 1 and 2, because the market values of the AIG Debt Securities were lower than par values, these turnover calculations are understated.[114]

[110] *See* Krogman v. Sterritt, 202 F.R.D. 467, 474 (N.D. Tex. 2001) (Weekly trading volume "appears to be one of the most important [indicators] in gauging the efficiency of the market for a particular stock"). (citation omitted).

[111] Cammer v. Bloom, 711 F. Supp. 1264, 1286 (D.N.J. 1989).

[112] Finnerty Declaration, *supra* note 61, at ¶ 62.

[113] Often both parties to a trade will report their activity, so this number might be double-counting turnover.

[114] Each of the AIG Debt Securities had a face value of $1,000, (though par price is often stated in terms of $100 value). Figures 1 and 2 show the

As further stated by the *AIG* court, it would have been helpful had Lead Plaintiffs "compared the [average weekly turnover,] volume, and value of trading in the AIG bonds to other securities for which studies or courts have found there exists an efficient market."[115] But, because no calculation of turnover was presented, the court had no basis from which to compare the trading of the AIG Debt Securities to the debt securities of other companies, such as Enron,[116] Just-For-Feet,[117] HealthSouth Corporation,[118] or DVI.[119] In litigation concerning bonds issued by each of these companies, the courts found sufficient evidence that all the bonds traded in efficient markets.[120] For example, a comparison of the

market value per security would be less as neither traded at or above par value. The authors also calculated turnover using information in the Plaintiffs' expert report (Exhibit P) which shows that the Average Value of Daily Trading Volume for Morgan Stanley alone was $1,841,182 and $38,722,246 for the 0.5% Notes and the Zero-Coupon Debentures, respectively. Along with the total number of trades for Morgan Stanley, the report contains enough information to calculate Morgan Stanley's total volumes over the period, which were $2.3 billion and $33.2 billion, respectively. Finally, the authors also used the number of weeks the AIG Debt Securities traded over the Class Period to calculate yet another measure of average weekly turnover for the 0.5% Notes and the Zero-Coupon Debentures, of 4.2% and 12.5%, respectively. Additional data based on the transaction volume reported in TRACE is also presented in the report. Calculations using these alternative data sources also show that turnover of the AIG Debt Securities was well in excess of the levels specified in *Cammer*. *See Cammer,* 711 F. Supp. at 1286; Finnerty Declaration, *supra* note 61.

[115] *AIG*, 265 F.R.D. 157, 177 (S.D.N.Y. 2010).

[116] *In re* Enron Corp. Sec., Derivative & "ERISA" Litig., 529 F. Supp. 2d 644, 752 (S.D. Tex. 2006).

[117] AAL High Yield Bond Fund v. Ruttenberg, 229 F.R.D. 676, 685 (N.D. Ala. 2005).

[118] *In re* HealthSouth Corp. Sec. Litig., 261 F.R.D. 616, 634 (N.D. Ala. 2009).

[119] *In re* DVI, Inc. Sec. Litig., 249 F.R.D. 196, 209, 214–15 (E.D. Pa. 2008), *aff'd*, 639 F.3d 623 (3d Cir. 2011).

[120] *In re* Enron Corp. Sec., Derivative & ERISA Litig., No. H 01-3624, 2005 U.S. Dist. LEXIS 41240, at *91 (S.D. Tex. Dec. 22, 2005); *DVI,* 249 F.R.D. at 209; *HealthSouth*, 261 F.R.D. at 634; *AAL High Yield Bond Fund*, 229 F.R.D. at 684–85.

turnover rates of the AIG Debt Securities with the bonds issued by these companies shows that the turnover of the AIG Debt Securities exceeded most of the Enron Notes,[121] and the two DVI Notes.[122] Average weekly turnover of the 0.5% Notes exceeded not only the turnover levels of DVI and Enron, but also average weekly turnover of the Just-For-Feet Bonds.[123] Had these measures of turnover been presented to the court, it is conceivable that the *AIG* court may have reached a different conclusion.[124]

2. Transaction Size and Frequency

Section III.A, above, discusses the characteristics of corporate bonds. These features and the forces of supply and demand in the corporate bond market make clear why corporate bonds will trade far less frequently than daily.[125]

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[121] Declaration of Suresh M. Sundaresan in Support of the Deutsche Bank Entities' Opposition to Lead Plaintiffs' Amended Motion for Class Certification at ¶¶ 82–83, *In re* Enron Corp., Derivative & "ERISA" Litig., 529 F. Supp. 2d 644 (S.D. Tex. 2006) (No. H-01-3624).

[122] *DVI*, 249 F.R.D. at 209, 214–15.

[123] *AAL High Yield Bond Fund*, 229 F.R.D. at 684–85. *See also* Plaintiffs' Response to Defendant Banc of America's Supplemental Opposition To Plaintiffs' Motion for Class Certification at 13, *AAL High Yield Bond Fund*, 229 F.R.D. 676 (N.D. Ala. 2005) (No. 2:00 Civ 01404) ("[A]verage weekly trading volume for the JFF Bonds (excluding the first week of trading) was 7.8% . . . .").

[124] The *Dynex* court minimized the importance of a precisely calculated turnover measure and suggested an "active" market for bonds was sufficient for a finding in favor of efficiency. *In re* Dynex Capital, Inc. Sec. Litig., No. 05 Civ. 1897 (HB), 2011 WL 781215, at *4 (S.D.N.Y. Mar. 7, 2011) ("This factor is not dispositive. First, even if a presumption based on 1% trading volume is not triggered, Dr. Ferri has shown that trading in the Bonds was active. Moreover, the *Cammer* presumption applied to stock trades, whereas the type of bonds at issue in this case trade 'relatively infrequently' in general . . . . A turnover rate below the 1% threshold established in *Cammer* for the stock market does not, without more, defeat a finding of an efficient bond market.").

[125] *See* Mahanti et al., *supra* note 87, at 278. *See also* NAT'L ASS'N OF SEC. DEALERS, TRADE REPORTING AND COMPLIANCE ENGINE FACT BOOK, FINANCIAL INDUSTRY REGULATORY AUTHORITY, 59–61 (2005), *available at* http://www.finra.org/web/groups/industry/@ip/@comp/@mt/documents/apps

In fact, nothing in the economics literature or in the case law suggests that in an efficient market a security must trade every day. The critical differences in the characteristics of stocks and bonds discussed above explain why there might be differences in the average transaction size and frequency of trades. Therefore, in order to assess correctly whether a security trades in an efficient market, it is important for courts to consider the differences between stock and bond market structures.[126] It is critically important to recognize and adjust for the fact that, while stock trading has a much higher level of retail or individual participation, bonds are traded primarily by institutions. The courts recognized the differences in the *HealthSouth,*[127] *DVI,*[128] and *Dynex Capital*[129] cases and, unlike the *AIG* court, these courts

upportdocs/p017618.pdf ("TRACE Fact Book"). According to the TRACE Fact Book for 2005, there were approximately 22,500 active publicly traded corporate bonds. Thus, this sample is very representative of the universe of corporate bonds.

[126] *See DVI*, 249 F.R.D. at 215 ("However, the trading level of the Senior Notes must be viewed in the context of corporate bond market.").

[127] *In re* HealthSouth Corp. Sec. Litig., 261 F.R.D. 616, 639 (N.D. Ala. 2009) ("[D]enying application of fraud on the market to the bond market because it does not operate in the same way as a national exchange or trade in the same volume, frequency, or manner as equity on those exchanges [would be like] throwing out oranges because they are not apples. The Court finds that the issue is not whether the market for equity is more efficient than the market for debt securities, but whether the market for debt securities is adequately informationally efficient (whether the price reflect[s] all publicly available information) to trigger the fraud-on-the-market presumption of reliance.") (citations omitted).

[128] *DVI*, 249 F.R.D. at 214 ("[A] comparison between equity and bond markets is a comparison between the proverbial apple and orange . . . [and] corporate bond investors cannot be categorically denied an opportunity to utilize the fraud on the market theory simply because of a structural difference in the way that debt securities are marketed and traded vis-a-vis equity securities.") (citations omitted).

[129] *Dynex Capital*, 2011 WL 781215, at *4 ("Dr. Ferri [the plaintiff's expert] has shown that trading in the Bonds was active. Moreover, the *Cammer* presumption applied to stock trades, whereas the type of bonds at issue in this case trade 'relatively infrequently' in general . . . . [A] turnover rate below the 1% threshold established in *Cammer* for the stock

concluded it was proper to compare the bond trading activity relative to other similar securities—i.e., the universe of corporate bonds.[130]

Moreover, even when a bond does not trade or trades infrequently, it does not mean that the market is shut down, the flow of information is restricted, or that firm-specific and external economic information is not being disseminated throughout the market. Interested investors can simply contact bond dealers and learn about dealers' buying and selling (bid and ask) prices and quantities. That there may be no trade on a given day does not mean that interested investors are not communicating, or that price and volume information is not readily available at low cost—i.e., that traders are unable to generate "transparency." The concept of transparency is discussed further below. Moreover, infrequent trading does not contradict the *Cammer* court's conclusion that in an efficient market "information (e.g., price and volume) is widely available."[131]

Lead Plaintiffs' expert concluded that both the AIG 0.5% and Zero-Coupon bonds were actively traded during the period when the Trade Reporting and Compliance Engine ("TRACE")[132] was in place. He observed that "[t]rades of the 0.5% Notes were reported [o]n TRACE beginning March 3,

market does not, without more, defeat a finding of an efficient bond market.").

[130] *See DVI*, 249 F.R.D. at 215 ("Furthermore, relative to other corporate bond issuances, the Senior Notes were very actively traded."); *HealthSouth*, 261 F.R.D. at 634 ("The comparisons Professor Seyhun made to the trading activity of other bonds are particularly helpful in that regard.").

[131] Cammer v. Bloom, 711 F. Supp. 1264, 1276 (D.N.J. 1989).

[132] "The Trade Reporting and Compliance Engine is the FINRA [Financial Institution Regulatory Authority] developed vehicle that [as of July 2, 2002] facilitates the mandatory reporting of over the counter secondary market transactions in eligible fixed income securities. All broker/dealers who are FINRA member firms have an obligation to report transactions in corporate bonds to TRACE under an SEC approved set of rules." TRADE REPORTING AND COMPLIANCE ENGINE, http://www.finra.org/Industry/Compliance/MarketTransparency/TRACE/ (last visited Dec. 1, 2011).

2003" while "[t]rades of the Zero-Coupon Debentures were reported . . . beginning July 1, 2002."[133] He also observed that the 0.5% bonds averaged 239 trades per year and 0.95 trades per trading day, while the Zero-Coupon bonds averaged 1,506 trades per year and 5.98 trades per trading day.[134]

AIG's expert countered this testimony, claiming that the trading of the bonds did not support a conclusion of market efficiency and noting that "the 0.5% Notes and the Zero-Coupon Debentures did not trade at all on approximately 283 days and 62 days [during the Class Period] respectively,"[135] and that this was true even though TRACE was active during the period in question.[136] The court agreed. Yet, as discussed above, the court's refusal to find market efficiency on the basis of the fact that the AIG Debt Securities failed to trade each day of the Class Period does not take into account the realities of the bond market. No benchmarks or accepted methodologies are described to determine how many days the securities need to trade before the market is found to be efficient. Thus, if the number of trading days for the AIG Debt Securities when there was no activity were 282 or 141 or 70 or one, instead of 283, would that lead to a fact-based conclusion that the bond is more likely to trade in a more efficient market? Or, alternatively, if the number of trading days in the Class Period when there was no activity were 300, 350 or more, would that lead to a fact-based conclusion that the bond is less likely to trade in a more efficient market? The answer to both questions must be no. Otherwise, all bonds trading in the $7.4 trillion corporate debt market must trade in inefficient markets, because few if any corporate bonds trade every day, year after year.[137]

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[133] Finnerty Declaration, *supra* note 61, at ¶ 60.

[134] *Id.* at ¶¶ 62–63.

[135] Declaration of Charles C. Cox at ¶ 62, *AIG*, 265 F.R.D. 157 (S.D.N.Y. 2010) (No. 04 Civ. 8141 (DAB)).

[136] *AIG*, 265 F.R.D. at 177.

[137] In 2000, out of 18,293 bonds, there were zero bonds that traded more than 200 days, while 7,872 bonds did not trade even once. More

The *AIG* court's finding that there was insufficient support for bond market efficiency on the basis of the number of trading days is also contrary to the economic theory of why parties trade in securities markets. Parties seek to trade to gain from informational advantages when they possess new information or have differences of opinions. Investors will enter into transactions only when there are differences of opinion based on changes in information. Thus, the finding in *AIG* could lead to the nonsensical conclusion that for a security to trade in an efficient market, it must trade each day even if there is no new information or changed investor circumstances. As discussed above, the differences between stocks and bonds suggest there will be on average fewer corporate bond transactions. In fact, if information or opinions do not change each day, yet there is high frequency of trading, this might be a sign that that security actually trades in an inefficient market that possibly resembles a casino.[138]

Unfortunately, the empirical analysis that the *AIG* court relied on failed to compare measures of transaction size and frequency of trading to those measures observed for other debt securities where other courts found that the securities

recent years also show similar patterns. *See* Mahanti et al., *supra* note 87, at 279 Table 5.

[138] Stock market efficiency does not require that there be a trade all the time, only that when there is a trade, the price at which the trade takes place should properly reflect all publicly available evidence. Some markets are simply less liquid than others, though this does not make them less efficient. Investors trade for different reasons, including to allocate their endowments, to achieve better diversification, to deal with shocks to liquidity, or because of the differences in their beliefs or information. It is possible that the arrival of some new information results in such a stock price reaction where all potential buyers and sellers believe that there is no advantage to be gained by trading at the new stock price. In this case, there can be zero trade associated with news arrival. Such an occurrence is not inconsistent with market efficiency. *See* G. William Schwert, *Stock Exchange Seats as Capital Assets*, 4 J. FIN. ECON. 51, 77 (1977) (finding that the market for New York Stock Exchange seats is highly efficient and reflects rents available from the seat, even though the trading is highly illiquid). In fact, New York Stock Exchange seats traded less than once a year.

trade in efficient markets.[139] The frequency of trading of the AIG Debt Securities is far greater when compared to the activity of the Just-for-Feet unregistered bonds,[140] the hundreds of Enron Notes,[141] and the DVI Notes,[142] all of which were found to have traded in efficient markets. The Zero-Coupon Debentures traded on 90% of the trading days, while the 0.5% Notes traded on 36% of the trading days or about two days per week.[143] For comparison, the Just-for-Feet unregistered bonds traded approximately 54% of the trading days or 2.7 days per week—in other words, less frequently than the Zero-Coupon Debenture.[144] Also trading far less frequently than the Zero-Coupon Debenture were the DVI Notes, which were traded on only 52% of trading days within the Class Period.[145] Finally, when compared to the frequency of trading of the Enron Notes, which also were found to be traded in an efficient market, it is clear that the AIG Debt Securities traded in a far more active market than the Enron Notes: the percentage of days on which the trades occurred for the AIG Debt Securities (90% and 36% for the

[139] *See, e.g., In re* DVI, Inc. Sec. Litig., 249 F.R.D. 196, 214–215 (E.D. Pa. 2008), *aff'd*, 639 F.3d 623 (3d Cir. 2011); *In re* Enron Corp. Sec. Derivative & "ERISA" Litig., 529 F. Supp. 2d 644, 756 (S.D. Tex. 2006); AAL High Yield Bond Fund v. Ruttenberg, 229 F.R.D. 676, 684–85 (N.D. Ala. 2005).

[140] *See AAL High Yield Bond Fund*, 229 F.R.D. at 685 (concluding that, regarding the Just for Feet bonds, "[t]he market for these bonds was informationally efficient notwithstanding that on some days the trading volume was low and on others, there was no trading at all . . . . The trading volume of the JFF high yield bonds *was not thin.* They traded on at least 75 of the 140 days between the initial offering and the Chapter 11 bankruptcy filing on November 3, 1999. Excluding the first week of trading, the average daily trading amount of JFF bonds was $3,245,107. The total face amount purchased by investors over the 140 days was $138,205,000, and the total sales were $316,110,000.") (citations omitted) (emphasis in original).

[141] *Enron*, 529 F. Supp. 2d at 756.

[142] *DVI*, 249 F.R.D. at 214–15.

[143] Finnerty Declaration, *supra* note 61, at Exhibit G.

[144] *AAL High Yield Bond Fund*, 229 F.R.D. at 685.

[145] *DVI*, 249 F.R.D. at 214–215.

Zero-Coupon Debenture and 0.5% Note, respectively) met or exceeded the percentages for all the Enron bonds.[146]

Finally, the average transaction sizes for the AIG 0.5% Notes and the Zero-Coupon Debentures, based on data from certain market makers, were $881,146 and $16,190,369, respectively.[147] That the market was able to absorb trades of this magnitude on a regular basis, without massive price movements accompanying the trades, suggests by itself that the AIG Debt Securities traded in an efficient market, not unlike the observations made by the *HealthSouth* court.[148] In the absence of information releases, efficient markets have sufficient liquidity to absorb large amounts of trading volume without large price fluctuations. The AIG Debt Securities' average transaction sizes are relatively large in comparison with those of other securities.[149] This suggests that the AIG Debt Securities market was in fact open, developed, and efficient, because it had the necessary liquidity to absorb these large transactions. It also shows there was substantial participation of sophisticated institutional traders. The participation of these institutional traders helps in price discovery and the efficiency of the

[146] The *Enron* court noted that "[t]he underwriter data reflect over 15,800 trades for Enron Registered Bonds during the Class Period. The number of transactions per issue during the Class Period ranged from 24 to 3,684 per issue, an average of 69, a median of 282 . . . . The percentage of days on which the trades occurred and the issue was outstanding falls between 1% (11 days) to 36% (132 days), with an average of 12.2% and a median of 9.71%." *Enron*, 529 F. Supp. 2d at 756.

[147] These figures are computed based on the data given in the Finnerty Declaration, *supra* note 61, at Exhibit P.

[148] *See, e.g., In re* HealthSouth Corp. Sec. Litig., 261 F.R.D. 616, 634 (N.D. Ala. 2009) ("The court finds that the substantial trading in HealthSouth bonds, as reflected in the relatively . . . large transaction amounts demonstrate that the market for HealthSouth bonds was developed and efficient, and that the secondary market was open throughout the class period.").

[149] *See, e.g., id.* at 634 ("The average dollar value of a single note transaction ranged from $500,000 to $1.5 million.").

market.[150] Moreover, as a proportion of the typical trade size, the normal search and other costs associated with these large transactions will be relatively small, thereby reducing the costs of trading.

3. The Straw Man of Transparency

The *AIG* court relied heavily on the concept of market transparency to support its ruling that the AIG Notes did not trade in or did not trade "consistent with" an efficient market.[151] The court concluded "that during the period in which AIG's bonds were reported on TRACE, there was increased transparency in those markets."[152] That finding, however, begs the question of whether those markets were efficient during the period when they were not reported on TRACE.[153]

The court's analysis has several major shortcomings. To begin with, transparency means that price and volume information is readily available to potential traders at a relatively low cost. For exchange-traded securities, exchanges collect and disseminate this information at a minimal cost to all interested parties. For over-the-counter traded bonds, price and volume information are not available at zero cost. At any given moment, however, this does not mean that interested investors are not communicating, or do not or cannot generate transparency (price and volume information for recently completed transactions or for future

[150] *See* Ekkehard Boehmer & Eric K. Kelley, *Institutional Investors and the Informational Efficiency of Prices*, 22 REV. FIN. STUD. 3563, 3574–80 (2009).

[151] *AIG*, 265 F.R.D. 157, 180–81 (S.D.N.Y. 2010).

[152] *Id.* at 177.

[153] In contrast to the *AIG* court, the court in *In re Dynex Capital, Inc. Securities Litigation*, No. 05 Civ. 1897 (HB), 2011 WL 781215, at *5 (S.D.N.Y. Mar. 7, 2011) stated: "The Second Circuit has approved the use of matrix [or derived] prices 'as long as they are shown to be consistent and reliable proxies for transaction prices.'" The *Dynex* court thus concluded that reporting on TRACE is not required and that, in fact, reported transaction prices are not required when one is examining whether a bond trades in an efficient market.

potential trades). As discussed above, an efficient market does not require that price and volume information be available at zero cost. E-mails or a simple telephone call, or, for that matter, twenty simultaneous emails or telephone calls from the trading floor or web access to the buy/sell offers on the Bloomberg Terminal[154] will supply sufficient transparency. As discussed above, the average dollar size of trades ranges from $818,000 for the AIG 0.5% Notes to over $16.0 million for the AIG Zero-Coupon Debentures. Hence, the cost of making a few, twenty, or even hundreds of telephone calls relative to the dollar volume of typical trade is miniscule on a percentage basis. Moreover, a majority of AIG Debt Security holders were the most sophisticated institutional traders, including insurance companies, hedge funds, mutual funds and others who are generally active traders in the corporate bond market.[155] It would not be too costly for bond traders to generate sufficient pricing information or transparency about the AIG Debt Securities by contacting the dealers[156] and negotiating their best deals with them.

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[154] The Bloomberg Terminal is a computer system provided by Bloomberg L.P. that enables financial professionals to access the Bloomberg Professional service through which users can monitor and analyze real-time financial market data movements and place trades. *See* BLOOMBERG, http://www.bloomberg.com/professional/ (last visited Dec. 1, 2011).

[155] *See AIG*, 265 F.R.D. at 177 ("For the third *Cammer* factor, Dr. Finnerty explained that the AIG bonds were underwritten by Morgan Stanley, a market maker with average daily trading volumes for both bonds in the millions of dollars, and that they were also heavily traded by other major brokers such as Deutsche Bank, Citigroup, Bear Stearns, Lehman Brothers and Goldman Sachs.").

[156] *See, e.g.*, *In re* HealthSouth Corp. Sec. Litig., 261 F.R.D. 616, 639 (N.D. Ala. 2009) ("Bond traders at large institutions who make transactions of six figures or more simply do not trade on insufficient information, or information perceived to be unreliable, or on less than all publicly available information. To argue that the investors in HealthSouth bonds did not have sufficient publicly available information in making their decisions about buying and/or selling HealthSouth bonds, and what would be a reasonable price for those bonds, defies logic and

This analysis is consistent with other courts' findings. For example, in *Enron*, the court stated that "transparency has not been established as the standard for an informationally efficient, over-the-counter bond market. Obviously 'transparency' is relative, involving consideration of numerous factors. No standard of requisite transparency has been established by the courts."[157] Broad generalizations about the institutional structure of the over-the-counter corporate bond market used to argue that the whole market is not transparent and thus is inefficient[158] are nonsensical. Otherwise, this logic would lead to the fallacy that all corporate bonds must trade in an inefficient market,[159] and

ignores the realities of the bond market in which billions of dollars trade hands.").

[157] *In re* Enron Corp. Sec. Litig., 529 F. Supp. 2d 644, 767 (S.D. Tex. 2006); *see also In re* DVI, Inc. Sec. Litig., 249 F.R.D. 196 (E.D. Pa. 2008), *aff'd*, 639 F.3d 623 (3d Cir. 2011).

[158] *See HealthSouth*, 261 F.R.D. at 639 ("Transparency has not to date been recognized as a requirement for an efficient market. In any event, transparency is relative and relative matters should be compared like to like. In terms of the bond market the court, therefore, concludes that the HealthSouth bond market traded on all the publicly available information and thus meets the test for informational efficiency.").

[159] The *HealthSouth* court noted:

> The Defendants then argue that, unlike stock, bonds do not trade on a formal, impersonal, centralized exchange, like the NYSE; that over-the-counter transactions are conducted over the phone or by computer; that an investor has to seek out a dealer to get a quote on a bond and may in fact receive different quotes from different dealers; and that an investor would thus have difficulty determining the prevailing price for a specific corporate bond . . . . In effect, the Defendants argue that the market for *all* bonds is inefficient because it does not function like the stock market. If the court were to accept these challenges, it would be "[d]enying application of fraud on the market to the bond market because it does not operate in the same way as a national exchange or trade in the same volume, frequency, or manner as equity on those exchanges [and would be like] throwing out oranges because they are not apples. The Court finds that the issue is not whether the market for equity is more efficient than the market for debt

thus no class of bondholders would be certified in class action litigation. As the *HealthSouth* court said, "to exclude over-the-counter transactions from the fraud-on-the-market presumption of reliance would severely limit the public policy behind the securities laws."[160] The corporate bond market is $7.4 trillion in size, compared to approximately $17.3 trillion in market capitalization of the equities traded on the NYSE and the National Association of Securities Dealers Automated Quotations ("NASDAQ") Stock Market as of December 2010.[161] Arguments regarding the lack of transparency in these markets are not well-founded. Furthermore, if these arguments are accepted by courts, they will also actively undermine the public policy underlying the securities laws as noted by the *HealthSouth* court.[162]

In *AIG,* there appears to be no direct connection between the discussion of transparency in the general state of trading in corporate bonds and the activity in AIG Debt Securities in particular. Unfortunately, the discussion of transparency related to the AIG Debt Securities does not offer a meaningful standard. Without a reliable benchmark, the issue of transparency turns rhetorical.[163]

> securities, but whether the market for debt securities is adequately informationally efficient (whether the price reflect[s] all publicly available information) to trigger the fraud-on-the-market presumption of reliance."

Id. at 638–39 (quoting *Enron*, 529 F. Supp. 2d at 768).

[160] *HealthSouth*, 261 F.R.D. at 639. *Cf.* DiRienzo v. Philip Servs. Corp., 294 F.3d 21, 33 (2d Cir. 2002) ("As the statute explaining the need for regulation and control of transactions in securities exchanges and over-the-counter markets states, these transactions are 'affected with a national public interest.'" (quoting 15 U.S.C. § 78b (2010)).

[161] In December 2010, the market capitalization of the U.S. stocks traded on the NYSE was $13.394 trillion, while on the NASDAQ the value was $3.889 trillion. Latest Statistics, WORLD FEDERATION OF EXCHANGES, http://www.world-exchanges.org/statistics/monthly-reports (last visited Dec. 1, 2011).

[162] *See supra* note 160 and accompanying text.

[163] Here, too, the *Enron* court's findings are instructive, and demonstrate an unwillingness to jettison longstanding and well-accepted standards for unsupported personal preferences: "The central question

Other courts have determined that the *Cammer* factors are the appropriate benchmarks for both over-the-counter common stocks and corporate bonds.[164] These factors are important because neither judicial precedent nor academic research have established an objective standard of transparency to define when a security trades in an efficient market.

4. Analyst Coverage and Corporate Bonds

Regarding the relevance of the *Cammer* factor concerning analyst coverage of bonds, the *AIG* court concluded that "the mere fact that a rating agency rates a bond is not indicative of it trading in an efficient market. Further . . . none of the industry analysts who examined AIG's Debt Securities discussed either the 0.5% or the Zero-Coupon bonds specifically, but rather analyzed AIG's bond ratings and financial performance generally . . . . Accordingly, the second *Cammer* factor provides little support to the claimed efficiency of the market for AIG's 0.5% and Zero-Coupon bonds."[165]

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under the fraud on the market theory is whether the stock price, *at the time a plaintiff effected a trade,* reflected the 'misinformation' alleged to have been disseminated." *In re* Enron Corp. Sec. Litig., 529 F. Supp. 2d 644, 767 (S.D. Tex. 2006) (citing Cammer v. Bloom, 711 F. Supp. 1264, 1282 (D.N.J. 1989)) (emphasis in original).

[164] *See, e.g.*, AAL High Yield Bond Fund v. Ruttenberg, 229 F.R.D. 676, 684–85 (N.D. Ala. 2005); *Enron,* 529 F. Supp. 2d 644; *In re* DVI, Inc. Sec. Litig., 249 F.R.D. 196 (E.D. Pa. 2008), *aff'd*, 639 F.3d 623 (3d Cir. 2011); *HealthSouth*, 261 F.R.D. 616; Krogman v. Sterrit, 202 F.R.D. 467, 477 (N.D. Tex. 2001); *In re* SCOR Holding (Switz.) AG Litig., 537 F. Supp. 2d 556, 574 (S.D.N.Y. 2008); *In re* Xcelera.com, 430 F.3d 503, 511 (1st Cir. 2005); Freeman v. Laventhol & Horwath, 915 F.2d 193 (6th Cir. 1990).

[165] *AIG*, 265 F.R.D. 157, 177 (S.D.N.Y. 2010). The idea that only analyst reports that analyze the individual securities that are being evaluated are relevant was dismissed in a recent court ruling where there were no analyst reports on the specific bonds, only general reports on the industry. *See In re* Dynex Capital, Inc. Sec. Litig., 05 Civ. 1897 (HB), 2011 WL 781215, at *5 (S.D.N.Y. Mar. 7, 2011) ("Nonetheless, Defendants' expert is unable to rebut the assertion that, in the context of the market for manufactured home bonds, there were enough reports throughout the

Financial information for a company will impact the prices of both its stock and bonds. An important concern to the bondholders is the overall financial health of the company, which determines the ability of the company to pay the promised series of coupons and the principal amount. Reports focused on a company's equity, which by definition is subordinate to the financial claims of bondholders, provide meaningful information on many financial factors, other than simply the outlook for stock prices and earnings. Thus, the equity reports provide vital information on the overall health of the firm.[166] Although positive equity reports would not have necessarily implied higher prices for the AAA-rated AIG Notes, negative equity reports might have implied lower prices. In particular, a substantial decline in stock prices could serve as an early warning sign for the bondholders. To this extent, both equity and credit reports provide important and useful information for AIG Debt Security holders.

The *AIG* court's finding that the analysts' coverage of the AIG bond ratings and general financial performance did not support the claim that the bonds traded in an efficient market is inconsistent with the conclusions reached by other courts finding that similar debt securities traded in efficient markets.[167] In *AIG*, twenty analysts followed the company.[168]

Class Period to provide a sufficient amount of information to satisfy this factor.").

[166] *See DVI*, 249 F.R.D. at 215 ("Though equity analyst coverage is not a perfect substitute for debt analyst coverage, the equity reports nevertheless provided substantial information to the Senior Notes investors. Such information, particularly forecasts of DVI's financial prospects and condition, would likewise have allowed bond investors to better understand DVI's risk profile and its potential for default."); *see also HealthSouth*, 261 F.R.D. at 635 ("The coverage by analysts of HealthSouth's equities also provided information of interest to the bond market when concerned with the overall financial health of the issuing firm . . . . The extensive coverage of HealthSouth in general and its bonds in particular by investment professionals, public media, and institutional investors reflects that HealthSouth notes traded in an efficient market.").

[167] *See, e.g., Enron*, 529 F. Supp. 2d at 768 (concluding that "plaintiffs made a *prima facie* showing that Enron Registered Bonds and Preferred Securities did trade in an efficient secondary market"); *DVI*, 249 F.R.D. at

By comparison, throughout the *Enron* Class Period, spanning from October 19, 1998 to November 27, 2001, approximately thirty different analysts prepared reports.[169] In *HealthSouth,* twenty different analysts prepared over three hundred reports.[170] In *DVI* only three analysts provided continuous coverage, issuing over eighty reports.[171] Thus, based on this *Cammer* factor, when compared to the findings of other courts, the evidence supports the conclusion that the AIG Debt Securities similarly traded in an efficient market.

C. Applying the Price-Related Factor to the Bond Market

The *Cammer* court's fifth factor for evaluating whether securities trade in an efficient market involves a showing of empirical facts demonstrating a cause-and-effect relationship between unexpected corporate events and a response in the stock price.[172] According to the U.S. Supreme Court in *Basic,* "the fraud on the market theory is based on the hypothesis that, in an open and developed securities market, the price of a company's stock is determined by the available material information regarding the company and its business."[173] As described above, bond pricing theory asserts that in an efficient market factors other than information regarding the company and its business are important determinants of the price of a company's corporate bond.

Understanding cause and effect for a particular bond price is not intuitive and it can be a source of confusion.

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216 (finding that "DVI's Senior Notes traded in an efficient market"); *AAL High Yield Bond Fund,* 229 F.R.D. at 685 (finding that "[p]laintiffs have made a sufficient showing of market efficiency to invoke the rebuttable presumption of reliance under [the 'fraud on the market' theory]").

[168] Finnerty Declaration, *supra* note 61, at ¶ 20.

[169] *Enron,* 529 F. Supp. 2d at 760.

[170] *HealthSouth,* 261 F.R.D. at 635.

[171] *DVI,* 249 F.R.D. at 209.

[172] Cammer v. Bloom, 711 F. Supp. 1264, 1287 (D.N.J. 1989).

[173] Basic, Inc. v. Levinson, 485 U.S. 224, 241–42 (1988) (quoting Peil v. Speiser, 806 F.2d 1154, 1160–61 (3d Cir. 1986)).

First, establishing *a priori* expectations is difficult for any securities market, let alone for a single bond. What is generally considered to be good news for a particular stock may be neutral or even bad news for a related bond. Similarly, what is generally considered to be bad news for a particular stock may again be neutral or even good news for the related bond. Moreover, for a given event the courts have understood bond price reaction will generally be less responsive than stock price reaction and may depend on the content and importance of the event.[174]

For example, in *HealthSouth,* the court found that "[t]he price of bonds reacts differently to unexpected new information than does the price of stocks. Information that may be material to a stock price, such as the announcement of a dividend, may not be material for a bond investor whose fixed return would not be affected. In contrast, the price of bonds may be affected by general, non-company specific information, such as changes in risk-free interest rates that would not affect stock prices."[175]

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[174] *See DVI,* 249 F.R.D. at 216 ("Lead Plaintiffs have established a sufficient cause and effect relationship to support a finding that the release of new public information affected the price of the Senior Notes. This finding is strengthened by the fact that, though debt securities are typically less responsive to new public information, there exists a high level of correlation between the Senior Notes' price changes and identifiable news events."). *See also* Jonathan R. Macey & Geoffrey P. Miller, *Good Finance, Bad Economics: An Analysis of the Fraud-on-the-Market-Theory,* 42 STAN. L. REV. 1059, 1085 (1990) ("[N]ot all corporate information will affect all securities of a given issuer in the same way. Debt securities will be more insulated from the shocks associated with bad news than will equity securities.").

[175] *HealthSouth,* 261 F.R.D. at 635. *See* Robert C. Merton, *On the Pricing of Corporate Debt: The Risk Structure of Interest Rates,* 29 J. FIN. 449, 455 (1974). The key element to stock and bond pricing theory is that both common stock and bonds may be viewed as options on the underlying assets of the corporation. Given limited liability, common shareholders have the option to default or pay off the bondholders in full when debt becomes due. If, when the debt matures, the value of the assets is less than the payment required to the bondholders, then shareholders will prefer to default and leave the assets to the bondholders. Otherwise, the shareholders will prefer to pay off the bondholders (by repaying the

Two examples will clarify this point. If a firm is doing well, and therefore the probability that it will default on its debt obligations is negligible, good news for the stock may be neutral news for the bonds because there is no upside earnings potential for the bonds. Similarly, bad news for the stock may be neutral news for the bonds if it does not affect the probability that the firm will default on its debt obligations. Also, although the stock price would likely react positively to unexpected dividend increases, bond prices may react positively to small dividends, but negatively to large dividends.[176] Therefore, without a full understanding of each bond's specific covenants and factors affecting its pricing, it is difficult to isolate and predict *a priori* the specific effects on bond prices of a specific news announcement.

There are two widely accepted hypotheses regarding the differential impact on bond and stock prices: (1) the information-effect hypothesis and (2) the wealth

principal amount of the debt) and 'purchase' the assets from the bondholders. Hence, we can view the common shareholders' claims on the firm as a call option on the assets with an exercise price equal to the face value of the bonds (i.e., the amount it takes to repay the principal amount of the debt). Similarly, the value of the bonds can be viewed as the value of the assets minus a call option on the assets. Viewed from this perspective, stock price and bond prices need not move in the same direction. As stated by Moody's, which has commercialized Dr. Merton's model, this theory suggests that "the default probability of the firm determines the default probability for all of the firm's debt or counterparty obligations. However, the loss in the event of default for each of the classes of obligations can vary widely depending on their nature (security, collateral, seniority, etc.)." *See* PETER CROSBIE & JEFF BOHN, MODELING DEFAULT RISK: MODELING METHODOLOGY 5 (Moody's KMV Company 2003), *available at* http://www.moodysanalytics.com/~/media/Insight/Quantitative-Research/Default-and-Recovery/03-18-12-Modeling-Default-Risk.ashx.

[176] *See* George Handjinicolaou & Avner Kalay, *Wealth Redistributions or Changes in Firm Value: An Analysis of Returns to Bondholders and Stockholders Around Dividend Announcements*, 13 J. FIN. ECON. 35 (1984). Also, Dhillon and Johnson find that stock prices and bond prices react in the opposite directions to dividend announcements. Stock prices increase by 0.98% while bond prices decline by 0.37% for dividend increases. For dividend decreases, stock prices decline by 2.01% while bond prices increase by 0.69%. *See* Upinder S. Dhillon & Herb Johnson, *The Effect of Dividend Changes on Stock and Bond Prices*, 49 J. FIN. 281, 287 (1994).

redistribution hypothesis. First, "[a]ccording to the information-effect hypothesis, changes in financial leverage convey management's expectations about the firm's prospects."[177] The information effect hypothesis, sometimes referred to as the information content hypothesis or the signaling theory, suggests that disclosures by firms that indicate improved prospects, all else constant, indicate greater cash flows. This suggests that stock and bond prices will move in tandem.

Second, "[t]he wealth redistribution hypothesis . . . differs from the information content hypothesis by stating that an increase (decrease) in the equity market value is accompanied by a decrease (increase) in the debt market value."[178] Thus, "the wealth redistribution hypothesis predicts offsetting changes in the values of individual classes of securities and no change in firm value."[179] This means that stock and bond price movements will be inversely related.

Thus, in general, any corporate disclosure must be carefully examined to determine whether it is negative for both bonds and stocks. An extreme hypothetical example will make this clear. Suppose Company A stock trades for $100 and its bonds trade at $50. There are $1.0 million in bonds that are expected to mature in five years and upon maturity bondholders will be paid $100 per bond. Next assume that after some period of time the Company announces it is really a shell corporation with only $1.0 million in cash. Further, assume that this triggers a violation in the bond covenants and requires immediate repayment of the debt at face value (i.e., $100). In this case, assuming no litigation or bankruptcy costs, bond pricing theory would predict that in an efficient market the bond

[177] Marcia Millon Cornett & Nickolaos G. Travlos, *Information Effects Associated with Debt-for-Equity and Equity-for-Debt Exchange Offers*, 44 J. FIN. 451, 453 (1989).

[178] Handjinicolaou & Kalay, *supra* note 176, at 38.

[179] Ronald W. Masulis, *The Effects of Capital Structure Change on Security Prices: A Study of Exchange Offers*, 8 J. FIN. ECON. 139, 143 (1980).

price would shoot up toward $100 and that the stock price would fall toward $0. Precisely the fact that stock and bond prices move in opposite directions is a sign that the two securities trade in efficient markets.

As it relates to the *AIG* matter, consider the following extreme hypothetical situation. Assume Company B, a large company with assets of $1.0 billion has equity worth $100 per share with its $1.0 million of AAA-rated bonds trading at par value or $100. For each of the next four quarters the company's performance exceeds expectations and when it discloses the positive news the stock increases by 10%. Would a bondholder be concerned that the price of the bond trading at par value did not increase upon these disclosures? Would we conclude that the bond traded in an inefficient market? The answer is "no" to both of these questions. In an efficient market, bond pricing theory would not predict that the bond price would increase upon the positive disclosures. Furthermore, that the firm-specific information has no impact on the bond price is not an indication that the bond trades in an inefficient market.

It is also instructive to take this example a step further. Assume that the Federal Reserve Bank announces an effort to generate higher interest rates, which leads to a large increase in Treasury rates. This will result in Company B's bonds falling in value as investors are able to secure higher returns from Treasury instruments. That the bond prices fall and the stock price goes up or does not change is not an indication that the bond trades in an inefficient market.

Finally, assume that Company B discloses that it has no assets, is going bankrupt, and will not be repaying the principal on its bonds. In this case the bond and stock prices will both fall, likely to zero. That up until that disclosure date the bond did not respond to firm-specific information, and yet then with this disclosure it does respond to firm-specific information, does not suggest the bond trades in an inefficient market. Instead, the losses to the bondholders can be directly linked to the bankruptcy disclosure, even though bond prices failed to react to prior firm-specific disclosures.

The relationship between price movements of the AIG Debt Securities and the AIG stock was also affected by the bond covenants, especially the rights of the bondholders to convert their AIG Debt Securities to stock. To understand this, we first describe the conversion rights for the holders of AIG's 0.5% Notes.

> (1) The bondholders had the right to exchange each of their Notes with a face value of $1,000 for the cash value of 7.17523 shares of AIG stock.[180]
>
> (2) The Notes were initially issued with a 20.6% conversion premium, which meant that for each share of stock the bondholder would need to convert $139.37 of the Notes. The $139.37 is called the conversion price. At a stock price below $139.37 it would be uneconomical for the bondholder to convert Notes to common stock.
>
> (3) Following a 3-for-2 stock split on July 31, 2000, the conversion price was adjusted to a price of $92.91. This meant that it was economical for a bondholder to convert the Notes to stock if the price were above $92.91.[181]

Next, we describe the conversion rights for the holders of AIG's Zero-Coupon Debentures.

> (1) The AIG Zero-Coupon Debentures were initially priced at 65.801% of the face value. It is common for zero-coupon securities to be priced below par value (i.e., $100) as they pay no interest, but instead appreciate over time as a substitute for interest payments.
>
> (2) These debentures had a conversion ratio of 6.0627, meaning they were convertible into 6.0627 shares of AIG common stock.

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[180] Hence, conversion ratio for the 0.5% Notes is 7.17523.

[181] This meant that also following a 3-for-2 stock split on July 31, 2000, the conversion ratio was increased to 10.7628, thus reaching a cash value equivalent to 10.7628 shares of AIG stock.

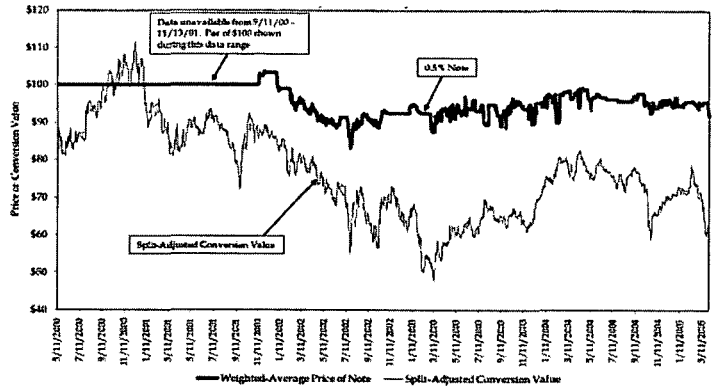
> (3) Thus, the initial conversion price for the Zero-Coupon Debentures was $108.53. This meant that it was economical for a bondholder to convert the Notes to stock if the price were above $108.53.
>
> (4) The conversion ratio was increased to 9.0942 shares of AIG common stock after the 3-for-2 stock split on July 31, 2000.
>
> (5) Thus, the conversion price for the Zero-Coupon Debentures was reduced to $72.35, which meant that it was economical for a bondholder to convert the Notes to stock if the price were above $72.35.

With this information we can examine Figures 3 and 4, which show both bond prices as well as conversion values. Conversion values represent the value of common shares that the bonds could be converted into. As discussed above, when the common stock price exceeds the conversion prices of the AIG Debt Securities, as they did in the early part of the Class Period (when the conversion values of the AIG Debt Securities based on AIG's split-adjusted common stock price stayed near or above these conversion prices), it was economical for bondholders to consider converting their bonds to stock. Economists would say that the conversion options for AIG Debt Securities were in-the-money. For instance, as shown in Figure 3, AIG common stock prices averaged $94.79, $96.75, and $98.33 during October, November, and December 2000, respectively (during the post-split period). Thus, the conversion option for the 0.5% Note was significantly in-the-money during this three-month period. For this reason, bond pricing theory predicts that in an efficient market the 0.5% Note would be expected to be sensitive to AIG common stock price movements in this early part of the Class Period. In fact, the prices of both AIG Debt Securities would be expected to reflect most of the changes in the stock price of AIG when they were close-to or in-the-money.

Figure 3 demonstrates that, during the period of corrective disclosures starting on October 14, 2004 to April 1,

2005, the conversion values on the 0.5% Notes based on AIG's split-adjusted common stock price (trading around $60 or less) remained well below the 0.5% Note prices, thus the conversion options for these Notes were out-of-the-money. As shown in Figure 4, during the period of Corrective Disclosures starting on October 14, 2004 to April 1, 2005 (the "Corrective Disclosure Period"), the conversion values on the Zero-Coupon Debentures based on AIG's split-adjusted common stock price (trading around $60–$65) generally remained at or below the Debenture prices, thus the conversion options for these Debentures were mostly out-of-the-money. In the ten months prior to the Corrective Disclosures, the conversion option on the Zero-Coupon Debenture was mostly at- or in-the-money, and would be expected to have exhibited sensitivity to AIG stock price movements and disclosures to firm-specific information. However, bond pricing theory predicts that in the Corrective Disclosure Period, in an efficient market, the prices of the AIG Debt Securities would behave similar to straight, non-convertible, investment grade Debentures, and therefore they would not exhibit as much sensitivity to AIG stock price movements and disclosures to firm-specific information that did not affect AIG's likelihood of default.

FIGURE 3: AIG SPLIT-ADJUSTED CONVERSION VALUE VS. WEIGHTED-AVERAGE PRICE OF 0.5% NOTE[182]

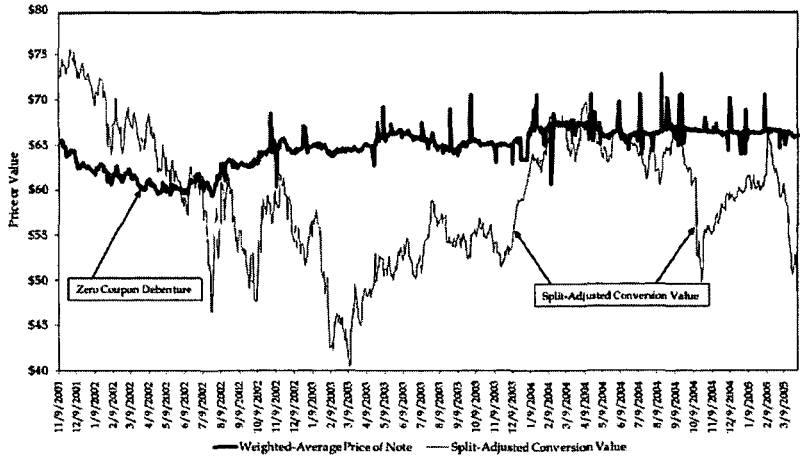


Source: Bloomberg and TRACE[183]

[182] CUSIP: 026874AN7.

[183] Bloomberg data is used for the 0.5% Note from May 11, 2000 to Feb. 28, 2003 (pricing data begins on Nov. 14, 2001). TRACE data for the 0.5% Note is used for Mar. 3, 2003 to Apr. 29, 2005.

FIGURE 4: AIG SPLIT-ADJUSTED CONVERSION VALUE VS. WEIGHTED-AVERAGE PRICE OF ZERO COUPON DEBENTURE[184]



Source: Bloomberg and TRACE[185]

1. Bonds Versus Stocks in Event Studies and Examining Returns

Even though there were distinctly separate periods where bond pricing theory would predict different relationships between the price movements of the AIG Debt Securities and AIG stock prices, Lead Plaintiffs presented a simple, linear regression analysis in an attempt to demonstrate that returns to the AIG Debt Securities reacted to value-relevant or firm-specific information.[186] Lead Plaintiffs' expert witness separately regressed each of the returns of the two AIG Debt Securities against AIG stock returns during the entire Class Period.[187] For both of the AIG Debt Securities,

[184] CUSIP: 026874AP2.

[185] Bloomberg data is used for the Zero Coupon Debenture from Nov. 9, 2001 to June 28, 2002. TRACE data for the Debenture is used for July 1, 2002 to Apr. 29, 2005.

[186] *See AIG*, 265 F.R.D. 157, 182–85 (S.D.N.Y. 2010).

[187] In the expert reports, there is no description of the data used in the regression analysis. Therefore, it is unclear what sources of price and return data were used. It is also unclear whether the analysis utilized

he found strong positive correlations between the returns of the AIG Debt Securities and the returns to AIG's stock. The adjusted R-square, used to measure the proportion of the stock returns that explain the returns to the debt, was 50%. In other words, he concluded that the variation in AIG's stock returns explained half of the variation in AIG Debt Securities returns. The t-statistics for the regression coefficients on the stock return variable, used to measure their statistical significance, ranged between 22.5 and 29.4, leaving no doubt about their statistical significance or importance for explaining the variation in the returns of the AIG Debt Securities. Thus, by using a simple linear regression, Lead Plaintiffs' expert demonstrated that the returns of the AIG Debt Securities reacted to firm-specific disclosures or value-relevant information during the Class Period.

The *AIG* court, however, evidently lacked the requisite understanding of *why* stock and bond prices might move in the same direction or inversely, or why certain information might have a significant effect on one of the securities and not the other. It is easy to see how, without that critical understanding, the court concluded these results did not warrant a finding of market efficiency. What was not incorporated into either the Lead Plaintiffs' expert's report or the *AIG* court's analysis was the critical role the convertibility of the AIG Debt Securities played in the regression analysis. As discussed above, the convertibility option moved in- and out-of-the-money during the Class Period; a careful analysis would have incorporated an explicit modeling of the convertibility option to be included in the regression. Thus, on October 14, 2004, the AIG stock price was $60.19 per share, while the bond prices of the 0.5% Note and the Zero-Coupon Debentures were $95.625 and $66.60, respectively. On October 14, 2004, the 0.5% Note was out-of-the-money with a conversion value of $64.78,

transaction prices for the AIG Debt Securities with variable holding periods or whether the analysis relied upon matrix prices and daily returns of the AIG Debt Securities.

while the Zero-Coupon Debenture was in-the-money with a conversion value of $54.74. Therefore, there was no reason that the 0.5% Note should have traded, unless the disclosure had an impact on AIG's likelihood of defaulting on its debt obligations. Lead Plaintiffs' evidence omitted this critical feature by presenting a simple, linear regression.

Because the changing values of the conversion option were not incorporated in the regression analysis presented to the court, the overly simplistic linear regression results are not applicable to the required statistical tests for the entire Class Period. The linear regression analysis assumes that, on average, AIG Debt Securities prices must react in a similar way as AIG stock prices to firm-specific information, due to the convertibility of the AIG Debt Securities. As described above, when the AIG stock price traded above the conversion prices of the AIG Debt Securities (as it did early in the Class Period), the conversion option was in-the-money, and AIG Debt Securities prices would be expected to move almost one-to-one with the AIG stock price movements. Moreover, when AIG stock prices traded significantly below the conversion prices of the AIG Debt Securities (as they did starting with the Corrective Disclosure Period), the conversion option is out-of-the-money and, especially for investment grade bonds, bond prices would not be expected to move much, if at all, in unison with the AIG stock price movements.[188] In other words, during the Corrective Disclosure Period, the AIG Debt Securities were similar to straight, investment grade, non-convertible bonds. Thus, the average relation between Common Stock price and Note prices measured over the entire Class Period is not a good

[188] A corrective disclosure is a release of information by a firm that reveals a prior misstatement or omission. Plaintiffs bringing an action under section 10(b) of the Securities Exchange Act and seeking to recover damages based on the market price of a security may recover for the difference between the purchase price(s) of the security and the mean price of the security during the 90-day period following the disclosure. *See* 15 U.S.C. § 78-u4 (2010).

estimate of the dynamic relation between prices of Notes and Common Stock during the Corrective Disclosure Period.[189]

Thus, bond pricing theory predicts that in an efficient market, economy-wide factors rather than firm-specific factors would have had a greater impact on bond returns on October 14, 2004. Given that the firm-specific information disclosed on October 14 would not have affected AIG's likelihood of default, in an efficient market bond pricing theory would predict that AIG Debt Securities would not display any significant price movements, which was exactly what was observed.[190]

Finally, the *AIG* court held that "on two of the four dates that he measured the change in bond prices, the 0.5% bonds did not trade at all; a finding that Dr. Cox opined, and the Court agrees, is not indicative of market efficiency."[191] Yet, this conclusion is based on faulty premises. As demonstrated above, most corporate bonds do not trade very frequently; furthermore, absence of trading in the bond market is not indicative of lack of efficiency.[192] In addition, if

[189] The authors did not have access to price data for the AIG Debt Securities for the Class Period used by the experts, so the authors have not run appropriately specified regressions, which would include the impact of changes in the conversion option.

[190] During the early part of the Class Period, while the AIG Debt Securities were close-to or in-the-money, their prices would have been sensitive to common stock prices, and thus the return volatilities of AIG Debt Securities would have been directly driven by the volatility of the AIG common stock returns. During the later Corrective Disclosure Period, because the conversion options for AIG Debt Securities were out-of-the-money, AIG Debt Securities returns would no longer be driven by AIG Common Stock returns, and the return volatility, as investment grade bonds, AIG Debt Securities would have been substantially less. A proper regression analysis would have adjusted the standard errors of the regression used to estimate the statistical significance of the AIG Debt Securities excess returns during the Disclosure Period (such as on October 14, 2004).

[191] *AIG*, 265 F.R.D. at 179.

[192] In reaching the opposite conclusion, the *Dynex* court observed that there was no trading for at least fifty-seven days after the corrective disclosure. However, based on the subsequent movements of the matrix prices (not necessarily transaction prices) that followed fifty-seven days

there was disclosure of firm-specific information, but that information did not impact the firm's probability of default on that instrument, then unless there was additional information or changes in investors' opinions related to the firm's fixed income securities, there would be no trading, on average, in the bonds in an efficient market.[193] Without an analysis of the probability of default, there is no empirical or theoretical support from which to reach a conclusion regarding efficiency.

VI. CONCLUSION

There are important differences between the stock market and the bond market when analyzing the fraud-on-the-market theory. Although the *Cammer* factors can be used to analyze bond market efficiency, they require adjustments to account for these differences, such as the domination of institutional trading activity in bond markets and bond covenants and convertibility, that complicate simple pricing models. Failure to account for these and other differences will confuse the courts about the application of the *Cammer* factors when evaluating market efficiency in class certification.

After its examination of the five factors listed by the court in *Cammer* and the bid-ask spread, identified by a court subsequent to *Cammer*,[194] as well as the alleged lack of transparency in the market, the *AIG* court determined the

later, it held that there was support for *immediate* cause and effect. *In re* Dynex Capital, Inc. Sec. Litig., 05 Civ. 1897 (HB), 2011 WL 781215, at *7 (S.D.N.Y. Mar. 7, 2011).

[193] The authors believe it was error to conclude that "[t]he lack of sales [was] inconsistent with the theory of an efficient market, and thus . . . that [Lead Plaintiffs' expert had not] provided a credible explanation for the reason that no 0.5% bonds were sold on two of the AIG-related news days." *AIG*, 265 F.R.D. at 180.

[194] *Krogman* supplements the five-factor test from *Cammer* with an analysis of the bid-ask spread of the security in question. *See* Krogman v. Sterritt, 202 F.R.D. 467, 474 (N.D. Tex. 2001) (citing Serfaty v. Int'l Automated Sys., 180 F.R.D. 418, 423 (D. Utah 1998); O'Neil v. Appel, 165 F.R.D. 479, 503 (W.D. Mich. 1996)).

evidence did not support a conclusion that the AIG Debt Securities traded in open, developed, and efficient markets.[195] The court thus ruled against certification of the class of AIG bondholders.[196] Unfortunately, this analysis failed to account for the critical distinctions between the market for corporate stocks and corporate bonds. Careful application of bond pricing theory requires adjustments to a *Cammer*-type examination of turnover and the relative transaction sizes, frequency of trade, as well as analyst reporting and cause-and-effect to accommodate the salient differences between bonds and stocks. Taking into account these differences yields a conclusion contrary to that reached by the *AIG* court—namely, that the AIG Debt Securities traded in open, developed, and efficient markets. Furthermore, as demonstrated above, with proper adjustments, the *Cammer* factors can and should be applied to the corporate bond market.

The impending inclusion in the class action litigation arena of hundreds of billions of dollars of new and more complex securities, for instance, structured products such as mortgage backed securities,[197] credit default swaps,[198] and

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[195] *AIG*, 265 F.R.D. at 181, 188.

[196] *Id.*

[197] The Securities and Exchange Commission defines mortgage-backed securities as follows:

> Mortgage-backed securities (MBS) are debt obligations that represent claims to the cash flows from pools of mortgage loans, most commonly on residential property. Mortgage loans are purchased from banks, mortgage companies, and other originators and then assembled into pools by a governmental, quasi-governmental, or private entity. The entity then issues securities that represent claims on the principal and interest payments made by borrowers on the loans in the pool, a process known as securitization.

Mortgage-Backed Securities, SEC, http://www.sec.gov/answers/mortgage securities.htm (last visited Dec. 1, 2011).

[198] Credit Default Swaps ("CDS") are defined as:

> contingent claims with payoffs that are linked to the credit risk of a given entity. The buyer of the CDS receives

collateralized debt obligations ("CDOs"),[199] makes even more important a rigorous theoretical analysis describing the economic and financial factors determining the expected price movements–for example, for corporate bonds the relationship between stock and bond price movements, as well as bond-to-bond price movements.[200] This is because,

> protection from default risk in exchange for periodic payments . . . until the expiration of the contract or until a predefined credit event occurs which, for our data, is default by the given entity. In the event of default, the buyer of the CDS spread receives a payoff equal to the difference between the face value and the market value of the underlying debt minus the CDS premium which has accrued between the default date and the last periodic payment date. In practice, buying a CDS contract is tantamount to buying insurance against default where the quarterly premium payments are determined from the CDS spreads.

SANJIV DAS, PAUL HANOUNA & ATULYA SARIN, FUNDAMENTALS-BASED VERSUS MARKET-BASED CROSS-SECTIONAL MODELS OF CDS SPREADS (2006), *available at* http://www.fdic.gov/bank/analytical/cfr/2006/sept/hanouna_p.pdf.

[199] *See* 15 U.S.C. § 78c (2010) (providing a definition of the term "asset-backed security"). Nomura Securities defines CDOs as follows:

> A CDO is similar to a regular mutual fund that buys bonds. However, unlike a mutual fund, most of the securities sold from a CDO are themselves bonds, rather than shares. In the simplest terms, a CDO is an arrangement that raises money primarily by issuing its own bonds and then invests the proceeds in a portfolio of bonds, loans, or similar assets. Payments on the portfolio are the main source of funds for repaying the CDO's own securities.

See NOMURA SEC. INT'L, INC., CDO'S IN PLAIN ENGLISH (2004), *available at* http://www.vinodkothari.com/Nomura_cdo_plainenglish.pdf.

[200] According to the Bank for International Settlements, the notional principal of outstanding over-the-counter derivatives issued in G10 countries in 2010 exceeded $600 trillion. The market value of these derivatives is estimated to be around $25 trillion (of which about $7 trillion is issued in the United States). Both of these amounts would easily dwarf most other capital markets. *See* BANK FOR INT'L SETTLEMENTS, AMOUNTS OUTSTANDING OF OVER-THE-COUNTER (OTC)

with these instruments, the complexity of the analysis is accentuated relative to corporate bonds. Furthermore, each structured product is unique.[201] Thus, even more so than with corporate bonds, it is incumbent upon the courts to appropriately adjust application of the *Cammer* factors to account for how these markets differ from the markets for corporate stocks when determining whether the security trades in an open, developed, and efficient market and thus whether to certify a class of security holders. To make their case, it also becomes incumbent on the parties claiming that the securities trade in efficient markets to present a thorough theoretical analysis in combination with reporting, explaining and interpreting their empirical results. Litigation related to CDOs and other structured investment products is well underway.[202] The size of these markets is comparable to the $7.4 trillion corporate bond market,[203] highlighting the importance of properly adjusting the *Cammer* factors based on the underlying financial theory.

The *AIG* decision also raises significant issues of public policy. For instance, it is notable that the Lead Plaintiffs seeking to certify the class of AIG bondholders were retirement and pension funds. To the extent the *AIG*

DERIVATIVES, *available at* http://www.bis.org/statistics/otcder/dt1920a.pdf; BANK FOR INT'L SETTLEMENTS, STATISTICAL ANNEX (2011), *available at* http://www.bis.org/ publ/ qtrpdf/r_qa1103.pdf#page=104.

[201] For instance, it is unlikely that there exist analysts' reports describing the financial conditions of specific structured products.

[202] *See generally* Wells Fargo Mortgage-Backed Certificates Litig., No. 09 Civ. 1376 (LHK) (N.D. Cal. filed Dec. 27, 2010); *In re* Wachovia Corp. Preferred Sec. & Bond/Notes Litig., No. 09 Civ. 6351 (S.D.N.Y. filed Mar. 23, 2011); *In re* Morgan Stanley Mortgage Pass-Through Certificates Litig., No. 09 Civ. 2137 (LTS) (S.D.N.Y. filed Nov. 22, 2010); Pub. Employees' Ret. Sys. of Miss. v. Merrill Lynch & Co., Inc., No. 08 Civ. 10841 (JSR) (S.D.N.Y. filed Dec. 1, 2010); Pub. Employees' Ret. Sys. of Miss. v. Goldman Sachs Grp., Inc., No. 09 Civ. 01110 (HB) (S.D.N.Y. filed Jan. 12, 2011); Bear Stearns Mortgage Pass-Through Litig., No. 08 Civ. 8093 (LTS) (S.D.N.Y. filed Dec. 23, 2009); Dodona I, LLC v. Goldman, Sachs & Co., No. 10 Civ. 7497 (JM) (S.D.N.Y. filed Sept. 30, 2010).

[203] BANK FOR INT'L SETTLEMENTS, AMOUNTS OUTSTANDING OF OVER-THE-COUNTER (OTC) DERIVATIVES (2011), *available at* http://www.bis.org/ statistics/otcder/dt1920a.pdf.

decision may lead future courts to conclude that over the counter bond markets lack indicia of efficient markets, one is left to wonder whether this market will be considered prudent for future pension and retirement fund investments.[204]

Moreover, the decision might hinder economic growth and development by increasing the cost of capital to corporations. When bondholders are prevented from collecting legitimate damages from fraudulent activities they have increased risks associated with investing in corporate debt issues. The result could be an increase in the cost of capital for all debt brought to the market as investors will require greater compensation (in terms of interest payments or discounts). Raising the cost of capital to companies in this way has the possibility of harming economic growth and development.

Furthermore, in a variant of Gresham's Law where "good and bad money cannot circulate together," the good companies that honestly report their financial performances may find themselves at a disadvantage relative to the bad companies that file fraudulent financial statements.[205] Because investors will only know after-the-fact which companies are legitimate, the good companies will have a relatively higher cost of capital than the bad companies, all else constant. This too will hurt economic growth and development.

As described by the U.S. Supreme Court, private securities-fraud class actions are "an essential supplement to criminal prosecutions and civil enforcement actions"[206] that aim to deter fraud and "maintain public confidence in the marketplace."[207] Thus, the decision in *AIG* has much broader

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[204] ERISA applies a prudent person standard of care to fiduciaries of employee benefit plans. *See* 42 U.S.C. § 1104(a)(1)(a) (2010). *See also* SUSAN P. SEROTA AND FREDERICK A. BRODIE, ERISA FIDUCIARY LAW 32–33 (2d ed. 2006).

[205] HENRY DUNNING MACLEOD, ELEMENTS OF POLITICAL ECONOMY 475–76 (1858).

[206] Tellabs, Inc. v. Makor Issues & Rights, Ltd., 551 U.S. 308, 313 (2007).

[207] Dura Pharm., Inc. v. Broudo, 544 U.S. 336, 345 (2005).

implications than simply failing to allow the AIG Debt Securities holders to have their day in court. It may negatively affect a significant mechanism to deter fraud in the marketplace for all debt instruments and discourage future potential plaintiffs from seeking redress in the courts.

We thus urge future litigants to provide the courts with all the empirical evidence needed to determine whether the financial instrument trades in an open and efficient market. We further urge courts to make appropriate adjustments to the factors weighed to determine the efficiency of the market to take into account all the unique features of the security at issue.