The Pricing and Performance of New Corporate Bonds: TRACE-Era Evidence*

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Current version: July 6, 2011

ABSTRACT

We test several hypotheses about the pricing and performance of new corporate bonds, examining 965 issues by seasoned publicly-traded U.S. firms for the years 2005-09, when trade data on bonds is available from TRACE. Our novel empirical approach includes several ex ante and ex post pricing and performance measures. Initially we find that the discrepancy between yield on a new corporate bond, Y, and the contemporaneous yield on a benchmark index matched on credit rating, maturity, and callability, Yb, (Y-Yb), is consistently negative. This discrepancy indicates that new corporate bonds generally are overpriced. For the typical BBB-rated bond issue of $450 mn., our estimate of the excess market value at issuance is $16.32 mn., or 3.63%. Returns on overpriced bonds exhibit return reversal behavior over time, consistent with a 'flipping' hypothesis associated with mispricing. In addition, both (Y-Yb) and long-term Rba are negatively related to pre-offering 'alpha' from pricing models applied to the issuing-firms' stocks, while post-offering abnormal returns on issuing-firms' stocks are positively related to (Y-Yb). These results link the overpricing of new corporate bonds to the overpricing of the issuing firm's stock.

JEL classification: G12; G14
Key words: Corporate bonds; Yield; Asset Pricing; Mispricing; Factors

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The pricing of new corporate bonds is an important issue because, historically, debt financing is the most important source of external capital for large, mature firms (e.g., Myers, 1984; Myers and Majluf, 1984; Caton et al., 2011). Yet extant empirical evidence is mixed as to whether new corporate bonds are fairly priced, underpriced, or overpriced. Several studies find that the yields on new corporate bonds are higher than benchmarks matched on the bases of credit rating, maturity, and callability, indicating that new corporate bonds are underpriced (Sorensen, 1982; Ederington, 1974; Lindvall 1977). In contrast, Fung and Rudd (1986) find that when better quality bond price data is used, underpricing disappears. Several additional studies address the issue by examining initial returns on new corporate bonds. Lindvall (1977) and Weinstein (1978) find that new corporate bonds have high benchmark-adjusted initial returns, and conclude that new corporate bonds are underpriced. Datta et al. (1997) find initial benchmark-adjusted returns of 1.86% for speculative-grade bonds and *negative* initial returns for investment-grade bonds. Similarly, Cai, Helwege, and Warga (2007) find positive (insignificant) initial benchmark-adjusted returns for new speculative-grade (investment-grade) bonds. Goldstein and Hotchkiss (2007) also find positive initial returns on new corporate bonds.

However, two related types of studies raise doubt about the conclusion that new corporate bonds are underpriced. First, Spiess and Affleck-Graves (1999), Clarke, Dunbar, and Kahle (2001), Bradshaw, Richardson, and Sloan (2006), and Cohen and Lys (2006) all document evidence that debt-issuing firms are overpriced, as their stocks generally have high (low) pre-(post-) issuance abnormal returns. This evidence indirectly suggests that new corporate bonds would be overpriced, rather than underpriced.

Second, the use of initial post-issuance returns to assess initial pricing status is open to question. For instance, in the stock IPO literature numerous studies have found that IPOs have very large first-day returns but very poor long-term performance thereafter. (e.g., Ritter 1991; Loughran and Ritter,1995; Hanley, 1993; Krigman, Shaw, and Womack, 1999). These results have led some researchers to question the basic conclusion in the literature that IPOs are underpriced at the offering. Purnanandam and Swaminathan (2004) compare valuations of IPO firms (based on the offer price) to valuations of industry peer firms. They find that the median IPO was significantly overvalued at the offer price relative to peers. Moreover, they find that the more highly overvalued IPOs have especially high first-day returns and especially low long-term returns. In addition, Krigman, Shaw, and Womack (1999) document evidence that large, supposedly informed, traders flip "hot" IPOs that are destined to perform worst in the future. That is, informed traders take advantage of the immediate post-issuance increase in price driven by uninformed investors by selling to them. (See also Aggarwal (2003).) This 'flipping potential' hypothesis thus explains the return reversal evidence observed in the IPO market. Moreover, the hypothesis suggests that higher initial post-issuance returns are an indicator of *overpricing* rather than underpricing.

The flipping potential hypothesis may also apply to the market for new corporate bonds. Specifically, "hot" new corporate bonds may actually be overpriced at issuance, and yet will exhibit high initial returns because of high demand by uninformed retail investors, which further drives up their price.[1] However, these issues are then even more overpriced, and so will have poor long-term performance after an initial trading period. Moreover, flipping potential may be greater with the advent of the TRACE secondary-market trade-reporting system, which has

[1] Goldstein and Hotchkiss (2007) document indirect evidence of flipping in the market for new corporate bonds.

substantially enhanced the ability of both informed (institutional) and uninformed (retail) investors to trade corporate bonds (Bessembinder et al., 2006; Bessembinder and Maxwell, 2008).

In light of the above discussion, this paper conducts empirical analyses of the pricing and performance of new corporate bonds issued during the TRACE era (specifically, 2005-09). Our analyses are more comprehensive than those of previous studies because we use ex ante and ex post pricing and performance measures for both: (a) the issued bond itself (i.e., yield discrepancy vs. benchmark and post-offering price performance); and (b) the issuing firm's stock price performance (i.e., pre-offering 'alpha' from asset pricing models and post-offering abnormal returns).

Denoting as (Y-Yb) the discrepancy between yield on a new corporate bond, Y, and the contemporaneous yield on a benchmark index matched on credit rating, maturity, and callability, Yb, we find that (Y-Yb) is reliably negative for the full sample and numerous subsamples, indicating that new corporate bonds are generally overpriced. For the typical BBB-rated bond issue of $450 mn., our estimate of the excess market value at issuance is $16.32 mn. In comparison, Ritter and Welch (2002) estimate that the average amount of money left on the table due to underpricing of equity IPOs in 1980–2001 is $17 million per IPO (in 2001 dollars; see their Table I). Thus, the mispricing of new corporate bonds is roughly as economically large as mispricing of equity IPOs.

Denoting post-offering benchmark-adjusted bond returns as Rba, we find that initial (i.e., short-term) Rba's are consistently positive. This result is sharply at odds with the evidence of overpricing based on (Y-Yb). However, for bonds that are especially overpriced on the basis of (Y-Yb), short-term Rba's are reliably reversed in the longer-term. Thus, the results are consistent

with the flipping potential hypothesis. Moreover, this return-reversal behavior is concentrated among firms that (a) are infrequent issuers, and (b) issued bonds with lower credit ratings.

Regarding the stock price performance of issuing firms, we initially find results consistent with previous literature noted above: On average issuing firms have positive pre-offering 'alpha' and negative post-offering abnormal returns. In addition, both (Y-Yb) and long-term Rba are negatively related to pre-issue stock alpha, while post-offering abnormal returns are positively related to (Y-Yb). These results link the overpricing of new corporate bonds to the overpricing of the issuing firm's stock.

The paper is organized as follows. Section I describes the data and methodology that we use in our empirical analyses. Section II presents results of pricing and performance analyses for the sample of corporate bonds. Section III presents results that relate bond pricing and performance to the pre-offering 'alpha' and post-offering abnormal returns on the issuing-firms stocks. Section IV concludes.

I. Data and Methodology

A. Data

We restrict our sample of new corporate bonds to those issued publicly by U.S. firms during the TRACE era. TRACE (Trade Reporting and Compliance Engine) was developed on a limited basis in 2002, and fully implemented for all publicly-issued U.S. corporate bonds in January 2005. Thus, we search for corporate bonds issued in 2005 or later, and extend the sample period to August 2009, which allows us to collect trade data on all sample bonds for 18 months after issuance. We use the Securities Data Corporation (SDC) database, the FINRA (Financial Industry Regulatory Authority) database, Citi's Yield Book database, and the TRACE database to identify and screen new issues of corporate bonds for various criteria.

The sample development process is summarized in Table I. We initially identified 3,682 corporate bonds that were publicly issued in the U.S. by U.S. firms and were recognized on TRACE. From this total we eliminated 1,249 issues of retail notes, which are small-volume bonds issued frequently and directly to retail investors. Next we eliminated 124 bonds that had non-standard characteristics (puttable, STEP, zero-to-full (ZTF) issues, and 144A bonds), 298 bonds that were not rated by any of the three major credit rating agencies, and 548 issues that were not traded on TRACE within 180 days of issuance. The large number of eliminations on the basis of non-trading attest to the thinness of trading in corporate bonds, even in the TRACE era. These eliminations resulted in a preliminary sample of 1,463 bonds. Finally, we eliminated 498 bonds that were issued by either privately-held firms or firms whose equity traded publicly for less than 18 months prior to the bond offering. Our final sample then consists of 965 bonds that were issued by seasoned publicly-traded U.S. firms and with at least one trade recorded on TRACE within 180 days of issuance.

The remainder of Table I shows breakdowns of the final sample in terms of issuer issuance frequency and initial trade on TRACE. Roughly half of our sample bonds (480 in total) were issued by firms that had not issued another bond within 18 months before or after the focal bond, while the other half (485 bonds in total) were issued by firms that had issued another bond within 18 months before or after. Issuer frequency is an important variable because frequent issuers may be less likely than infrequent issuers to issue overpriced bonds. Both Spiess and Affleck-Graves (1999) and Butler and Wan (2010) restrict their samples of new corporate bonds to issuers that did not have another bond offering within five years. We do not restrict our sample in terms of firm-level issue frequency because we want to investigate the effects of issue frequency on bond pricing and performance. We do so by splitting the sample by issue frequency, as defined.

A total of 790 (175) of the bonds in our final sample traded (did not trade) within 7 days of the offering. As with issuer frequency, we do not restrict our sample to bonds that trade within a specified number of days (e.g., 7 days) after issuance, even though we do not, and practically cannot, measure the post-issuance performance of bonds that do not trade soon after issuance. Given the general thinness of trading in corporate bonds, it is important to investigate the characteristics and pricing behavior of late-trading bonds to the extent possible.

Table II provides summary statistics for the characteristics of the new corporate bonds in our sample, as well as their issuers. The initial columns show frequency distributions for the full sample by: (i) issuer size decile; (ii) issuer age (since IPO); (iii) industry; (iv) seasoned vs. initlal bond offering status; (v) issue size; (vi) years to maturity; (vii) credit rating: (viii) callability; and (ix) year of issuance. The remaining columns show corresponding frequencies for subsamples of: (a) frequent vs. infrequent issuers; and (b) bonds with initial trade on TRACE within or later than 7 days of issuance.

The bond issuers in our sample generally are very large and mature. At year-end before the offering, 71.1% of the firms are in the largest size decile (decile 10) in terms of market equity value relative to all NYSE, AMEX and NASDAQ firms, and 81.7% of the issuers have been publicly traded for more than 10 years. However, the infrequent issuers, and the firms that issued bonds with late trading commencement on TRACE, are somewhat smaller and younger. Bonds of infrequent issuers and those with late trading commencement also tend to have lower credit ratings. Maturities range widely, but bond maturities of more than 20 years are fairly unusual. Regarding callability, the industry standard is the make whole call provision, accounting for 78.8% of all bonds in the sample. Finally, offering dates are fairly evenly distributed across the sample years. This is important because the sample period includes the period of the credit crisis,

which peaked in late 2008 through early 2009. Indeed, relatively few bonds in our sample were issued during the crisis.

Finally, we use Yield Book to collect information about bond issues, bond indicative data and rating histories from three major rating agencies (Standard and Poor's, Moody's and Fitch), while other indicative data is obtained from FINRA. We also use Yield Book for yields and returns on benchmark indexes. Yield Book's corporate indexes are more detailed than those that can be obtained from Lehman, including breakdowns by credit rating, maturity, and callability.[2] Of course, TRACE is our source of all secondary-market bond prices. We also use data from the Center for Research in Security Prices (CRSP) monthly database to estimate pricing models for the stocks of the issuing firms and to calculate post-offering abnormal returns on the stocks.

B. Methodology

As noted earlier, we calculate yield discrepancy, (Y-Yb), as the difference between yield on a new corporate bond, Y, and the contemporaneous yield on a benchmark index matched on credit rating, maturity, and callability, Yb. Y, Yb, and (Y-Yb) are expressed in percent throughout the paper. We use the yield discrepancy measure rather than the *yield spread* over treasuries because several studies indicate that yield spreads contain a substantial illiquidity component, and this liquidity component is strongly related to credit rating (e.g., Chen, Lesmond and Wei, 2007; Bao, Pan, and Wong, 2010).Thus, the yield discrepancy measure should well control for liquidity.

[2] For comparable indexes, the correlations of daily yields on Lehman and Yield Book indexes are very high (exceeding 0.99). Bessembinder, Kahle, Maxwell, and Xu (2009) argue against using partitions along other dimensions in studies of bond excess returns and do not support finer partitions that leave too few bonds in each index.

All bond returns are benchmark-adjusted holding-period returns, and are calculated as follows. Denoting the offer price as P_0 and a subsequent trade-weighted price[3] at date t as P_t, the holding-period return on the bond is

$$R_{0,t} = (P_t - P_0 + AccInt)/P_0, \quad (1)$$

where AccInt is the accrued interest on the bond over the period (0, t).[4] Denoting as $Rb_{0,t}$ the analogous return on the benchmark index, the bond's benchmark-adjusted return, $Rba_{0,t}$, is

$$Rba_{0,t} = R_{0,t} - Rb_{0,t} \quad (2)$$

We denote the benchmark-adjusted return on a bond from the offer price to the first trade on TRACE as $Rba_{0,first}$. Benchmark-adjusted returns from the offer price to 1, 2, 6, and 18 months after the offering are denoted as $Rba_{0,1}$, $Rba_{0,2}$, $Rba_{0,6}$, and $Rba_{0,18}$, respectively. Benchmark returns from the end of the first month to the end of two, six, and 18 months are denoted as $Rba_{1,2}$, $Rba_{1,6}$, and $Rba_{1,18}$, respectively. All Rba's are expressed in percent and are not annualized.

In the latter part of the paper we analyze the stock price performance of the issuing firms' stocks for evidence of mispricing, and also relate pre- and post-issue stock performance to the pricing and performance of the issued bonds. For this purpose we measure stock price performance using alternatively the market model and the Fama-French (1993) three-factor model, and using monthly data. Defining the issue month as month 0, we estimate each model for each issuing firm by regressing excess returns on the firm's stock on (a) excess returns on the market portfolio (MKTRF), for the market model, and (b) MKTRF, the size factor SMB, and the

[3] See Bessembinder et al (2009) for discussion of the importance of using trade-weighted prices in the calculation of bond returns. TRACE records large volume transaction without providing precise transaction size: all transactions above $1 million for speculative grade bonds and above $5 million for investment grade bonds are recorded as $1 million and $5 million correspondingly. We used these values for transaction sizes. Results of using opening or closing bond prices instead of the trade-weighted average price are quantitatively similar and are not reported.

[4] Both offer price and transaction prices from TRACE are clean (or *flat*), so accrued interest must be added.

book-to-market factor HML, using monthly returns from months -18 through -1. For each model the intercept of the regression, denoted as ALPHA, is our measure of the firm's ex ante performance. To assess post-issuance stock price performance, we use the estimated parameters of the pricing model to calculate abnormal excess returns for each month from month 0 through month +18. For each stock, the average abnormal return for the post-issuance months is denoted as AARpost.

II. Pricing and Performance: Initial Evidence

In this section we initially examine the discrepancy between yields on new corporate bonds and their benchmarks, defined earlier as (Y-Yb). Next, we examine the behavior of benchmark-adjusted returns, Rba, on new corporate bonds by investment horizon. We conclude the section with an illustration of the price behavior of new corporate bonds and a brief discussion of the economic importance of bond mispricing.

A. New-Issue Yield Discrepancy

Mean values of the yield discrepancy measure (Y-Yb) are shown in Table III for the full sample and various subsamples. For the full sample, the mean is -0.583%, and is highly significant (t-value=17.80). Moreover, the mean value of (Y-Yb) is reliably negative for nearly all subsamples in the table. Indeed, mean (Y-Yb) is positive for only one subsample in the entire table, that of bond IBOs for frequent issuers (i.e., the initial bond offering of a firm that will issue one or more bonds within 18 months); however, there are only 3 issues in this subsample (see Table II).

Mean (Y-Yb) it is noticeably smaller in absolute value for (i) small-cap issuers vs. large-cap issuers, and (ii) lower-rated bonds vs. higher-rated bonds. Interestingly, though, mean values of (Y-Yb) are very similar for (i) frequent vs. infrequent issuers, and (ii) bonds that are traded early

vs. later on TRACE. Nevertheless, the overal evidence attests to the ubiquity of the *overpricing* of new corporate bonds in the TRACE era, and is in contrast to the mixed evidence on yield discrepancy for new corporate bonds found in earlier studies, discussed in the introduction.

B. Benchmark-Adjusted Holding-Period Returns on New Corporate Bonds

Table IV shows mean and median benchmark-adjusted holding period returns from the offer price to the first trade and to two, six, and 18 months after issuance, for the full sample and various subsamples. Note, though, that the full sample here includes only those bonds that had an initial trade on TRACE within 7 days of issuance. For the full sample, both mean and median values of $Rba_{0,first}$ are reliably positive, with values of 0.687% and 0.470%, respectively. Mean and median Rba's then increase to 1.162% and 0.769% by the end of the first month. However, mean Rba's peak at this horizon. Mean and median Rba's are similar at the two-month horizon (1.153% and 0.792%, resp.), and then decline to the six-month horizon (0.639% and 0.635%, resp.) and then become negative, though insignificant, at the 18-month horizon (-0.252% and -0.537%, resp.). Thus, while initial post-issuance returns suggest underpricing consistent with previous research (discussed earlier), this evidence is deceptive because they tend to be reversed in the long-term. Indeed, this initial return-reversal evidence is consistent with the flipping potential hypothesis, and therefore suggests that new corporate bonds are actually *overpriced*. Below we conduct more formal tests of return-reversal behavior. Meanwhile, the initial evidence of return-reversal behavior in Table IV is consistent across all subsamples shown, though it is barely perceptible for the subsample of investment-grade bonds.

Next, we conduct more formal tests of return-reversal behavior. In our initial tests, we calculate mean and median benchmark-adjusted holding-period returns on the sample bonds from the end of the first month after issuance to, alternatively, two, six, and 18 months after

issuance, denoted earlier as $Rba_{1,2}$, $Rba_{1,6}$, and $Rba_{1,18}$, respectively. The results are displayed in Table V. For the full-sample, results of which are shown in Panel A, both the mean and median values of $Rba_{1,2}$ are insignificant. However, for both $Rba_{1,6}$ and $Rba_{1,18}$, both the mean and median are reliably negative. Thus, the sample bonds reliably underperform benchmarks after the first month, consistent with the flipping potential hypothesis.

Panels B and C show results for the subsamples of frequent and infrequent issuers. For both subsamples, long-term performance from month 1 through month 18 is reliably negative based on both mean and median values of $Rba_{1,18}$, though the infrequent issuers perform more poorly (e.g., mean values of $Rba_{1,18}$ are -0.841% and -2.070% for the frequent and infrequent issuers, respectively). This evidence suggests that the bonds of frequent issuers are less overpriced. Panels D, E, and F show results for the upper investment-grade, lower investment-grade (BBB), and speculative-grade bonds. The upper investment-grade bonds do not appear to perform poorly on average after month 1, as the average and median values of both $Rba_{1,6}$ and $Rba_{1,18}$ are insignificant. However, both the lower investment-grade bonds and the speculative-grade bonds exhibit reliably negative medium-term and long-term benchmark-adjusted returns, as for both subsamples the mean and median values of both $Rba_{1,6}$ and $Rba_{1,18}$ are reliably negative. Noting the associations among issue frequency, firm size, firm age, and credit ratings in Table II, we surmise that the evidence in Table V indicates that smaller, younger, riskier firms are more likely to issue overpriced bonds.

For our second test of return-reversal behavior, we estimate a cross-sectional regression of average monthly long-term returns, $Rba_{1,18}$, on short-term returns, $Rba_{0,1}$. Return-reversal behavior would be manifest in a negative slope coefficient in this regression. We initially estimate this regression using all observations. However, we suspect that return reversal would

be more strongly manifest for bonds that are overpriced on the basis of the yield discrepancy variable (Y-Yb). Thus, we split the sample at the median of (Y-Yb) to isolate bonds that are relatively overpriced (Y-Yb<median) vs. relatively underpriced (Y-Yb>median), and estimate the regression for each of these subsamples.

The results are displayed in Table VI. Results for the full sample and its median-split subsamples are shown in Panel A. Using all observations, the slope coefficient of the regression is insignificant. Thus, return-reversal behavior is not a general phenomenon. However, for the subsample of bonds that are more overpriced (i.e, Y-Yb<median), the coefficient is -0.326 and is significant at the 5% level. Thus, return-reversal behavior is manifest for bonds that are especially overpriced, consistent with the flipping potential hypothesis. Similar results obtain using subsamples of frequent vs. infrequent issuers (Panels B and C) and subsamples by credit rating (Panels D, E, and F).

Next, we again split the sample at the median of (Y-Yb) to isolate bonds that are relatively overpriced (Y-Yb<median) vs. relatively underpriced (Y-Yb>median), and calculate and compare the mean values of both $Rba_{0,1}$ and $Rba_{1,18}$ across these subsamples. We make these calculations alternatively using the full sample, frequent issuers, infrequent issuers, and issues in each of the previously-designated credit rating ranges.

The results are displayed in the left-most portions of Table VII. For the full sample and most subsamples, mean $Rba_{0,1}$ is reliably smaller for the (Y-Yb)-based relatively overpriced bonds than for the (Y-Yb)-based relatively underpriced bonds, though both are reliably positive. We interpret these results as indicating that, while "hot" issue, overpriced bonds have positive short-term returns, they are not as high, on average, as the short-term returns of "cold" issue, relatively underpriced bonds. Meanwhile, for the full sample mean $Rba_{1,18}$ is reliably lower for relatively

overpriced bonds than for relatively underpriced bonds (Diff.=-4.608%; t-value=7.85). Indeed, for the relatively overpriced bonds mean $Rba_{1,18}$ is reliably negative (-3.706%; t-value=-9.17), while for the relatively underpriced bonds mean $Rba_{1,18}$ is reliably positive (0.902%; t-value=2.12). Similar results obtain for the various subsamples with the exception of the speculative-grade bonds, where the individual means, as well as the mean difference, are basically insignificant.

Finally, the right-most portion of Table VII shows the results of regressions of, alternatively $Rba_{0,1}$ and $Rba_{1,18}$, on the yield discrepancy variable (Y-Yb). For both return variables and for the full sample as well as most subsamples, the slope coefficient of the regression is reliably positive. These results are important, as they indicate that both short-term and long-term benchmark-adjusted bond returns are forecastable using the yield discrepancy variable (Y-Yb), though the adjusted R^2s are sometimes very low.

C. An Illustration of the Price Behavior of New Corporate Bonds

To illustrate the typical price performance of new corporate bonds, we focus on the subsample of BBB-rated bonds. We develop a representative bond for this subsample by calculating the average coupon rate and maturity. We then calculate the fair value of this representative bond by applying the average benchmark yield, Yb. The resulting fair value is $96.50 per $100 of par value. This fair value is assumed constant for 18 months after 'issuance.' In contrast, the offer price of the representative bond is $100, and its post-offering price behavior over time is dictated by average benchmark-adjusted returns. The results are displayed in Figure 1. The actual price initially rises from $100 at issuance to a peak relative price of $100.79, and then falls to a final price of $97.54 18 months after issuance. Thus, the initial overpricing is

3.63% (=100/96.50), the overpricing peaks at 4.45% (=100.79/96.50), and the overpricing after 18 months is 1.08% (=97.54/96.50).

D. The Economic Importance of Bond Mispricing

The economic importance of the overpricing of a given new corporate bond can be measured by the excess market value of the entire issue. Using the values calculated above for the BBB subsample and the median issue size for BBB bonds in our sample, $450 mn, our estimate of the economic value of the overpricing of the typical BBB-rated bond is $16.32 mn (=3.63% of $450 mn). By comparison, average amount of money left on the table due to underpricing of equity IPOs in 1980–2001 is $17 million per IPO (2001 dollars, Ritter and Welch (2002), Table I). These figures make mispricing of new bond issues as economically large as mispricing of equity IPOs. Moreover, given that U.S. firms issue several hundred bonds in a typical year, the economic importance of bond overpricing is measured in $billions annually.

III. Relationships Among the Pricing and Performance of the Stocks and Bonds of Bond-Issuing Firms

In this section, we initially estimate the pre- and post-offering performance of the stocks of the bond-issuing firms in our sample. We then conduct several tests of relationships between pre- and post-offering stock price performance and the pricing and performance of the issued bonds. Based on the discussion and results thus far, our general prediction is that, at the time of issuance, both the stocks and bonds of bond-issuing firms are generally overpriced. However, mispricing at issuance likely varies cross-sectionally. Consequently, measures of stock and bond pricing and performance should be related to each other. For instance, yield discrepancy (Y-Yb) should be positively related to pre-issuance stock price performance, or 'alpha.'

A. Performance Measures for the Stocks of Bond-Issuing Firms

We use both the market model and the Fama-French (1993) three-factor model to estimate the pre- and post-offering performance of the stocks of bond-issuing firms using monthly data. We estimate the parameters of each model for each issuing firm by regressing monthly excess returns on the firm's stock on (a) monthly excess returns on the market portfolio (MKTRF), for the market model, and (b) monthly returns on MKTRF, the size factor SMB, and the book-to-market factor HML. The parameters are estimated using monthly returns from months -18 through -1 relative to the issuance month, month 0. For each model the intercept of the regression, denoted as ALPHA, is our measure of the firm's ex ante performance. To assess post-issuance stock price performance, we use the estimated parameters of a focal pricing model to calculate abnormal returns for each month from month 0 through month +18. For each stock, the average abnormal return for the post-issuance months is then calculated, and is denoted as AARpost.

The results are displayed in Table VIII. Results of using the market model (Fama-French three-factor model) are shown in Panel A (Panel B). In each panel, average parameter values are shown for the full sample as well as subsamples of frequent vs. infrequent issuers and bonds that did vs. did not register their initial trade within 7 days of issuance.

We discuss the results for the market model first. The average 'beta' is 0.993, indicating that the typical stock in our sample has moderate market risk. Across the subsamples, mean beta ranges from 0.889 for the frequent issuers to 1.250 for the delayed-trading subsample. More importantly, the mean value of ALPHA is reliably positive not only for the full sample (0.656%; t-value=12.20), but also for every subsample. Regarding post-issuance performance, for the full sample the mean and median values of AARpost are reliably negative (-0.472% and -0.398%,

resp.). For all subsamples, both the mean and median values of AARpost are negative, and these values are reliable except for the frequent issuers. Overall, the results in Panel A are consistent with previous studies (discussed earlier) finding that the stocks of bond-issuing firms have substantial 'run-up' prior to the offering and suffer poor post-offering performance.

The results for the Fama-French model are similar to those for the market model with respect to mean values of ALPHA and mean and median values of AARpost. Thus, the results in Panel B also are consistent with previous research regarding the pre- and post-offering stock price performance of bond-issuing firms. It is also interesting, to note that the coefficient of SMB is larger for the infrequent issuers and delayed-traded subsamples, though this result is not surprising given that both types of firms are generally smaller. The coefficient of HML is relatively high for the delayed-trading sample, which is not surprising, but is also relatively high for the subsample of frequent issuers, which is somewhat surprising.

In summary, the results in Table VIII suggest that the stocks of the bond-issuing firms are overpriced at the time of the offering, as they have reliably positive mean pre-offering 'alpha' and reliably negative mean post-offering abnormal return. These results therefore place us in good position to examine relationships among the pre- and post-offering stock price performances and the pricing and performance of the issued bonds.

B. Relating Ex Ante and Ex Post Stock Price Performance to Yield Discrepancy

Do overpriced firms issue overpriced bonds? The evidence thus far indirectly indicates that this is generally the case. However, two types of regressions can be used to provide direct evidence on this question. The first is a regression of ALPHA on (Y-Yb). To the extent that a firm's equity is overpriced at the time of the offering (i.e., ALPHA is high), then it may be able to issue bonds that have a relatively low yield (i.e., Y-Yb is low), so we expect the slope

coefficient of this regressions to be negative. The second is a regression of AARpost on (Y-Yb). Here (Y-Yb) is a negative measure of overpricing not only of the firm's bonds but also its stock, so we expect the slope coefficient of this regression to be positive. That is, (Y-Yb) is a forecaster of post-offering abnormal returns on the issuing firm's stock. We estimate these regressions using (a) alternative estimates of ALPHA and AARpost based on the market model and the Fama-French three-factor model, and (b) using the full sample as well as various subsamples. Here the full sample includes firms with delayed trading on TRACE because the regressions do not involve post-offering bond returns.

The results are displayed in Table IX. Column headings indicate the equity pricing model employed and the focal regression. Results for the full sample are shown in Panel A. In the regression of (Y-Yb) on ALPHA, the slope coefficient is reliably negative, as expected, using estimates of ALPHA based on both the market model (slope=-0.086; t-value=-4.43) and the Fama-French three-factor model (slope=-0.087; t-value=-4.82). In the regression of AARpost on (Y-Yb), the slope coefficient is reliably positive, as expected, using estimates of AARpost based on both the market model (slope=0.318; t-value=3.58) and the Fama-French three-factor model (slope=0.371; t-value=3.77).

Thus, the evidence strongly indicates that, at the time of a bond offering, the mispricing of the stocks and bonds of the bond-issuing firm are linked. Moreover, the results are economically, as well as statistically, significant. The first regression indicates that an increase of 1 percentage point in ALPHA would, on average, reduce the offering yield by 8.6 (8.7) basis points based on market model (Fama-French three-factor model) estimates. The second regression indicates that an increase of 1 percentage point in (Y-Yb) would, on average, be associated with an increase of 0.318% (0.371%) per month, or roughly 3.82% (4.45%) per annum, in the post-offering

abnormal returns on the issuing-firms stock based on market model (Fama-French three-factor model) estimates. In addition, the results are robust to subsample scrutiny, as indicated in the remaining panels of Table IX. For every subsample and using both equity-pricing models, the slope coefficient of the first (second) regression is negative (positive), and are statistically weak only for the second regressions for the frequent-issuer and speculative-grade subsamples.

C. Short- and Long-Term Bond Price Performance as a Function of ALPHA and (Y-Yb)

Earlier we found that both short- and long-term bond price performance is positively related to the yield discrepancy variable (Y-Yb) (see Table VII). If the mispricing of firms' bonds and stocks are linked, then we should also find that bond price performance, especially in the long-term, is negatively related to the pre-offering run-up in the stock price, or ALPHA. To test this prediction, we regress post-offering benchmark-adjusted bond returns, alternatively in the short-term (i.e., $Rba_{0,1}$) and the long-term (i.e, $Rba_{1,18}$), on ALPHA. However, we have two a priori reasons to be concerned that the results of these regressions would be weak even if the predicted relationship is true. First, short-term bond performance is potentially disturbed by flipping activity associated with the especially overpriced bonds. Second, ALPHA is likely measured with substantial error, so it is hazardous to use this variable as a regressor. To address the second concern, we repeat the regressions after adding (Y-Yb) as a second regressor. If (Y-Yb) is a less-noisy measure of mispricing, then (Y-Yb) should dominate in the regression, increasing the adjusted R^2 substantially and driving the coefficient of ALPHA toward zero.

We estimate the regressions using both the full sample (i.e., of early-trading bonds only) and various subsamples, and using estimates of ALPHA based alternatively on the market model and the Fama-French model. The results are displayed in Table X.

We initially discuss the results for the full sample, shown in Panel A. In the regression of short-term bond returns ($Rba_{0,1}$), the coefficient of ALPHA is insignificant whether it is estimated using the market model or the Fama-French model, and whether or not the second regressor (Y-Yb) is included. We attribute the weakness of these results to distortions in short-term bond returns induced by flipping activity, though an alternative explanation is that a one-month horizon is simply insufficient time to expect mispricing to be corrected.

By contrast, in the regression of long-term bond returns ($Rba_{1,18}$), the coefficient of ALPHA, as a sole regressor, is reliably negative, as expected, for estimates of ALPHA based on both the market model and the Fama-French model. These results therefore establish a link between the pre-offering mispricing of the issuing firm's stock and the post-offering performance of the issued bond. However, when (Y-Yb) is added as a second regressor, the adjusted R^2 increases substantially and both the magnitude and significance of the coefficient of ALPHA decreases substantially whether ALPHA is estimated using the market model or the Fama-French model. These results suggest that, while ALPHA and (Y-Yb) contain common information about the mispricing of the issued bond, (Y-Yb) is the stronger predictor of long-term bond return, perhaps because it is measured with less noise.

Finally, results for the various subsamples, shown in Panels B-F, are qualitatively similar to the results for the full sample. Specifically, in the regression of $Rba_{0,1}$ ($Rba_{1,18}$) the coefficient of ALPHA as a sole regressor is generally insignificant (negative and significant), and in the regression of $Rba_{1,18}$ adding (Y-Yb) generally drives the coefficient of ALPHA toward zero.

IV. Conclusion

This paper provides new evidence on the pricing and performance of new corporate bonds issued in the U.S. by seasoned publicly traded U.S firms during the TRACE era (i.e., 2005-09).

In contrast to evidence from previous studies, we find that new corporate bonds are generally overpriced based on the yield discrepancy variable (Y-Yb). For the typical BBB-rated bond issue of $450 mn., our estimate of the excess market value at issuance is $16.32 mn. Nevertheless, new corporate bonds have reliably *positive* benchmark-adjusted returns (Rba) over the first month after issuance, though they provide reliably negative Rba thereafter through 18 months. We attribute this return-reversal behavior to flipping activity in the early secondary market, whereby informed (institutional) investors sell the especially overpriced bonds at still higher prices to uninformed (retail) investors. We also find that the stocks of the issuing firms are generally overpriced, and document evidence linking the overpricing and poor long-term performance of the issued bonds to the overpricing of the issuing firm's stock.

References

Aggarwal, Reena, 2003. Allocation of Initial Public Offerings and Flipping Activity, Journal of Financial Economics 68, 111–135.

Baker, Malcolm, and Jeffrey Wurgler, 2002, Market Timing and Capital Structure, Journal of Finance 57, 1–32.

Bao, Jack, Jun Pan, and Jiang Wang, 2010. The Illiquidity of Corporate Bonds. Journal of Finance, forthcoming.

Benveniste, Lawrence M., and Paul A. Spindt, 1989, How Investment Bankers Determine the Offer Price and Allocation of New Issues, Journal of Financial Economics 24, 343–361.

Bessembinder, Hendrik, Kathleen M. Kahle, William F. Maxwell, and Danielle Xu, 2009, Measuring Abnormal Bond Performance, Review of Financial Studies 22, 4219–4258.

Bessembinder, Hendrik, and William F. Maxwell, 2008. Transparency and the Corporate Bond Market. Journal of Economic Perspectives 22, 217–234.

Bessembinder, Hendrik, William F. Maxwell, and Kumar Venkataraman, 2006, Market Transparency, Liquidity Externalities, and Institutional Trading Costs in Corporate Bonds, Journal of Financial Economics 82, 251–288.

Blume, Marshall E., Donald B. Keim, and Sandeep A. Patel, 1991, Returns and Volatility of Low-Grade Bonds 1977–1989, Journal of Finance 46, 49–74.

Bradshaw, Mark T., Scott A. Richardson, and Richard G. Sloan, 2006, The Relation between Corporate Financing Activities, Analysts' Forecasts and Stock Returns, Journal of Accounting and Economics 42, 53–85.

Butler, A.W., H. Wan, 2010. Stock Market Liquidity and the Long-run Stock Performance of Debt Issuers. Review of Financial Studies 23, 3966-3995.

Cai, Nianyun (Kelly), Jean Helwege, and Arthur Warga, 2007, Underpricing in the Corporate Bond Market, Review of Financial Studies 20, 2021–2046.

Caton, Gary L., Chiraphol N. Chiyachantana, Chua Choong Tze, and Jeremy Goh, 2008, Earnings Management Surrounding Seasoned Bond Offerings: Do Managers Mislead Ratings Agencies and the Bond Market? Journal of Financial and Quantitative Analysis 46, 687–708.

Chen, Long, David Lesmond, and Jason Wei, 2007, Coporate yield spreads and bond liquidity, Journal of Finance 62, 119–149.

Cheung, Rayner, Joseph C. Bencivenga, and Frank J. Fabozzi, 1992, Original Issue High-Yield Bonds: Historical Return and Default Experiences 1977–1989, Journal of Fixed Income 2, 58–76.

Clarke, Jonathan, Craig Dunbar, and Kathleen M. Kahle, 2001, Long-Run Performance and Insider Trading in Completed and Canceled Seasoned Equity Offerings, Journal of Financial and Quantitative Analysis 36, 415–430.

Cohen, Daniel A., and Thomas Z. Lys, 2006, Weighing the Evidence on the Relation between External Corporate Financing Activities, Accruals and Stock Returns, Journal of Accounting and Economics 42, 87–105.

Cornell, Bradford, and Kevin Green, 1991, The Investment Performance of Low-Grade Bond Funds, Journal of Finance 46, 29–48.

Datta, Sudip, Mai Iskandar-Datta, and Ajay Patel, 1997, The Pricing of Initial Public Offers of Corporate Straight Debt, Journal of Finance 52, 379–396.

Ederington, Louis H., 1974, The Yield Spread on New Issues of Corporate Bonds, Journal of Finance 29, 1531–1543.

Edwards, Amy K., Lawrence E. Harris, and Michael S. Piwowar, 2007, Corporate Bond Market Transaction Costs and Transparency, Journal of Finance 62, 1421–1451.

Elton, Edwin J., Martin J. Gruber, Deepak Agrawal, and Christopher Mann, 2001, Explaining the Rate Spread on Corporate Bonds, Journal of Finance 56, 247–277.

Fama, Eugene F., and Kenneth R. French, 1993, Common Risk Factors in the Returns on Stocks and Bonds, Journal of Financial Economics 33, 3–56.

Fung, W. K. H., and Andrew Rudd, 1986, Pricing New Corporate Bond Issues: An Analysis of Issue Cost and Seasoning Effects, Journal of Finance 41, 633–643.
Goldstein, M. and E. Hotchkiss, 2007. Dealer Behavior and the Trading of Newly Issued Corporate Bonds, Working paper, Boston College and Babson College.
Goldstein, M., E. Hotchkiss, and E. Sirri, 2007. Transparency and Liquidity: A Controlled Experiment on Corporate Bonds, Review of Financial Studies, 20(2), 235-273.
Graham, John R., and Campbell R. Harvey, 2001, The Theory and Practice of Corporate Finance: Evidence from the Field, Journal of Financial Economics 60, 187–243.
Hale, Galina, and Joao A.C. Santos, 2009, Do Banks Price Their Informational Monopoly? Journal of Financial Economics 93, 185–206.
Hanley, Kathleen Weiss, 1993. The Underpricing of Initial Public Offerings and the Partial Adjustment Phenomenon, Journal of Financial Economics 34, 231–250.
Helwege, Jean, and Paul Kleiman, 1998. The Pricing of High-Yield Debt IPOs, Journal of Fixed Income 8, 61–68.
Krigman, Laurie, Wayne H. Shaw, and Kent L. Womack, 1999, The Persistence of IPO Mispricing and the Predictive Power of Flipping, Journal of Finance 54, 1015–1044.
Lindvall, John R., 1977, New Issue Corporate Bonds, Seasoned Market Efficiency and Yield Spreads, Journal of Finance 32, 1057–1067.
Loughran, Tim, and Jay R. Ritter, 1995, The New Issues Puzzle, Journal of Finance 50, 23–51.
Myers, Stewart C., 1984. The Capital Structure Puzzle. Journal of Finance 39, 575-592.
Myers, S.C., Majluf, N.S., 1984. Corporate financing and investment decisions when firms have information the investors do not have. Journal of Financial Economics 13, 187–221.
Purnanandam, Amiyatosh K., and Bhaskaran Swaminathan, 2004, Are IPOs Really Underpriced?, Review of Financial Studies 17, 811–848.
Ritter, Jay R., 1991, The Long-Run Performance of Initial Public Offerings, Journal of Finance 46, 3–27.
Ritter, Jay R., and Ivo Welch, 2002, A Review of IPO Activity, Pricing, and Allocations, Journal of Finance 57, 1795–1828.
Sorensen, Eric H., 1982, On the Seasoning Process of New Bonds: Some Are More Seasoned Than Others, Journal of Financial and Quantitative Analysis 17, 195–208.
Spiess, D. Katherine, and John Affleck-Graves, 1995, Underperformance in Long-Run Stock Returns Following Seasoned Equity Offerings, Journal of Financial Economics 38, 243–267.
Spiess, D. Katherine, and John Affleck-Graves, 1999, The Long-Run Performance of Stock Returns Following Debt Offerings, Journal of Financial Economics 54, 45–73.
Weinstein, Mark I., 1978, The Seasoning Process of New Corporate Bond Issues, Journal of Finance 33, 1343–1354.
West, Richard R., 1973, Bond Ratings, Bond Yields and Financial Regulation: Some Findings, Journal of Law and Economics 16, 159–168.

Table I

Sample Development

We use the SDC, FINRA, Citi/Salomon, and TRACE databases to identify and screen new corporate bonds issued in the U.S. by U.S. firms between January 2005 and August 2009. The final sample of 965 bonds were issued by seasoned publicly-traded U.S. firms and are traded on TRACE within 180 days of issuance.

Total corporate bonds publicly issued in the U.S. by U.S. Firms and Recognized on TRACE		3,682
Less:		
Retail Notes	1,249	
Putable, STEP, ZTF, and 144A Bonds	124	
Unrated Bonds	298	
Bonds not Traded within 180 Days of Issuance	548	
	2,219	-2,219
		1,463
Private Firms and Firms Public for less than 18 Months	498	-498
Final Sample		965
By Issuer's Issue Frequency		
Infrequent Issuer: No Other Bond Issued by Same Firm within 18 Months Before or After Focal Bond		480
Frequent Issuer: All Others		485
		965
By Initial TRACE Trading:		
Initial TRACE Trade within 7 Days of Issuance		790
Initial TRACE Trade later than 7 Days After Issuance		175
		965

Table II

Characteristics of Bond Issuers and Issues

The initial columns show frequency distributions of the sample of 965 new corporate bonds by: (i) issuer size decile; (ii) issuer age (since IPO); (iii) industry; (iv) seasoned vs. initlal bond offering status; (v) issue size; (vi) years to maturity; (vii) credit rating: (viii) callability; and (ix) year of issuance. The remaining columns show corresponding frequencies for subsamples of: (a) frequent vs. infrequent issuers; and (b) bonds with initial trade on TRACE within or later than 7 days of issuance.

			Frequent Issuer				Traded on TRACE within 7 Days			
Value of Characteristic	Full Sample		Yes		No		Yes		No	
	N	%	N	%	N	%	N	%	N	%
Panel A: All Issues										
Total	965	100.0	485	100.0	480	100.0	790	100.0	175	100.0
Panel B: Issuer Size Decile (Market Equity Value, Relative to all NYSE, AMEX, and NASDAQ Firms)										
1-9 (Small & Medium)	279	28.9	82	16.9	197	41.0	170	21.5	109	62.3
10 (Large)	686	71.1	403	83.1	283	59.0	620	78.5	66	37.7
Panel C: Issuer Age (Years Since Stock IPO)										
Less than Five Years	71	7.4	29	6.0	42	8.8	44	5.6	27	15.4
Five to Ten Years	106	11.0	43	8.9	63	13.1	71	9.0	35	20.0
More than Ten Years	788	81.7	413	85.2	375	78.1	675	85.4	113	64.6
Panel D: Industry										
Industrial	773	80.1	347	71.6	426	88.8	635	80.4	138	78.9
Utility	192	19.9	138	28.5	54	11.3	155	19.6	37	21.1
Panel E: Seasoned Bond Offering (SBO) vs. Initial Bond Offering (IBO)										
SBO	926	96.0	482	99.4	444	92.5	757	95.8	169	96.6
IBO	39	4.0	3	0.6	36	7.5	33	4.2	6	3.4
Panel F: Issue Size										
Less than $300 Mn.	260	26.9	106	21.9	154	32.1	173	21.9	87	49.7
$300 Mn. To $500 Mn.	379	39.3	179	36.9	200	41.7	326	41.3	53	30.3
More than $500 Mn.	326	33.8	200	41.2	126	26.3	291	36.8	35	20.0
Panel G: Years to Maturity										
Less than 10 years	345	35.8	154	31.8	191	39.8	252	31.9	93	53.1
10 to 20 years	454	47.1	225	46.4	229	47.7	386	48.9	68	38.9
More than 20 Years	166	17.2	106	21.9	60	12.5	152	19.2	14	8.0
Panel H: Credit Rating (S&P Equivalent)										
AAA, AA, A	332	34.4	204	42.1	128	26.7	319	40.4	13	7.4
BBB	392	40.6	202	41.7	190	39.6	355	44.9	37	21.1
BB, B, CCC	241	25.0	79	16.3	162	33.8	116	14.7	125	71.4
Panel I: Callability										
Make Whole Call	760	78.8	420	86.6	340	70.8	683	86.5	77	44.0
Noncallable	40	4.1	24	5.0	16	3.3	34	4.3	6	3.4
Fixed Price Call	165	17.1	41	8.5	124	25.8	73	9.2	92	52.6
Panel J: Year of Issuance										
2005	144	14.9	55	11.3	89	18.5	86	10.9	58	33.1
2006	156	16.2	74	15.3	82	17.1	119	15.1	37	21.1
2007	221	22.9	113	23.3	108	22.5	180	22.8	41	23.4
2008	192	19.9	134	27.6	58	12.1	164	20.8	28	16.0
2009	252	26.1	109	22.5	143	29.8	241	30.5	11	6.3

Table III

Ex Ante Bond Pricing: New-Issue Yield Vs. Benchmark

This table shows the mean value of the discrepancy, (Y-Yb), between the yield on a new corporate bond (Y) and the contemporaneous yield on a benchmark index matched on rating, maturity, and callability (Yb). The initial columns show the mean for the full sample and by: (i) issuer size decile; (ii) issuer age (since IPO); (iii) industry; (iv) seasoned vs. initial bond offering status; (v) issue size; (vi) years to maturity; (vii) credit rating: (viii) callability; and (ix) year of issuance. The remaining columns show corresponding means for subsamples of: (a) frequent vs. infrequent issuers; and (b) bonds with initial trade on TRACE within or later than 7 days of issuance.

Value of Characteristic	Full Sample		Frequent Issuer				Traded on TRACE within 7 Days			
			Yes		No		Yes		No	
	Mean (%)	t-value	Mean (%)	t-value	Mean (%)	t-value	Mean (%)	t-value	Mean (%)	t-value
Panel A: All Issues										
Total	-0.583	-17.80 ***	-0.625	-14.04 ***	-0.540	-11.25 ***	-0.582	-16.45 ***	-0.584	-6.95 ***
Panel B: Issuer Size Decile (Market Equity Value, Among NYSE, AMEX, and NASDAQ Firms)										
1-9 (Small & Medium)	-0.358	-4.95 ***	-0.345	-2.51 **	-0.363	-4.27 ***	-0.295	-3.00 ***	-0.456	-4.42 ***
10 (Large)	-0.674	-19.34 ***	-0.682	-15.08 ***	-0.663	-12.10 ***	-0.661	-18.59 ***	-0.795	-5.66 ***
Panel C: Issuer Age (Years Since Stock IPO)										
Less than Five Years	-0.435	-3.69 ***	-0.650	-3.55 ***	-0.287	-1.89 *	-0.527	-3.29 ***	-0.286	-1.71 *
Five to Ten Years	-0.743	-7.36 ***	-0.787	-5.57 ***	-0.713	-5.07 ***	-0.635	-4.95 ***	-0.962	-6.15 ***
More than Ten Years	-0.574	-15.90 ***	-0.607	-12.50 ***	-0.539	-9.99 ***	-0.580	-15.34 ***	-0.538	-4.81 ***
Panel D: Industry										
Industrial	-0.564	-14.75 ***	-0.601	-10.61 ***	-0.534	-10.29 ***	-0.557	-13.49 ***	-0.539	-3.68 ***
Utility	-0.658	-11.40 ***	-0.685	-10.59 ***	-0.587	-4.82 ***	-0.686	-11.01 ***	-0.557	-13.49 ***
Panel E: Seasoned Bond Offering (SBO) vs. Initial Bond Offering (IBO)										
SBO	-0.592	-17.68 ***	-0.631	-14.24 ***	-0.548	-10.86 ***	-0.591	-16.35 ***	-0.594	-6.89 ***
IBO	-0.367	-2.39 **	0.396	0.40	-0.431	-2.93 ***	-0.377	-2.18 **	-0.314	-0.93
Panel F: Issue Size										
Less than $300 Mn.	-0.539	-9.09 ***	-0.616	-8.07 ***	-0.487	-5.71 ***	-0.554	-8.27 ***	-0.511	-4.34 ***
$300 Mn. To $500 Mn.	-0.583	-10.18 ***	-0.665	-7.69 ***	-0.509	-6.71 ***	-0.579	-9.27 ***	-0.604	-4.25 ***
More than $500 Mn.	-0.617	-11.81 ***	-0.594	-9.33 ***	-0.653	-7.27 ***	-0.603	-11.44 ***	-0.737	-3.45 ***
Panel G: Years to Maturity										
Less than 10 years	-0.699	-10.54 ***	-0.870	-9.26 ***	-0.562	-6.12 ***	-0.711	-9.33 ***	-0.667	-4.96 ***
10 to 20 years	-0.632	-14.58 ***	-0.658	-10.35 ***	-0.607	-10.26 ***	-0.648	-13.64 ***	-0.540	-5.16 ***
More than 20 Years	-0.205	-4.45 ***	-0.201	-4.24 ***	-0.213	-2.20 **	-0.201	-4.30 ***	-0.250	-1.19
Panel H: Credit Rating (S&P Equivalent)										
AAA, AA, A	-0.783	-15.46 ***	-0.790	-11.69 ***	-0.771	-10.21 ***	-0.774	-15.52 ***	-0.999	-2.33 **
BBB	-0.488	-10.82 ***	-0.482	-7.36 ***	-0.494	-7.97 ***	-0.501	-10.69 ***	-0.362	-2.24 **
BB, B, CCC	-0.461	-5.67 ***	-0.566	-4.62 ***	-0.410	-3.90 ***	-0.305	-2.32 **	-0.607	-6.23 ***
Panel I: Callability										
Make Whole Call	-0.599	-18.17 ***	-0.642	-13.98 ***	-0.546	-11.62 ***	-0.605	-17.91 ***	-0.553	-4.29 ***
Noncallable	-0.445	-2.71 ***	-0.474	-2.38 **	-0.401	-1.39	-0.445	-2.38 **	-0.445	-1.45
Fixed Price Call	-0.539	-4.92 ***	-0.539	-2.59 **	-0.539	-4.18 ***	-0.438	-2.20 **	-0.620	-5.29 ***
Panel J: Year of Issuance										
2005	-0.586	-9.42 ***	-0.569	-6.81 ***	-0.596	-6.88 ***	-0.448	-7.51 ***	-0.790	-6.45 ***
2006	-0.434	-6.69 ***	-0.423	-4.89 ***	-0.445	-4.62 ***	-0.473	-6.28 ***	-0.309	-2.44 **
2007	-0.201	-5.34 ***	-0.316	-7.29 ***	-0.082	-1.35	-0.220	-6.59 ***	-0.122	-0.86
2008	-0.705	-8.70 ***	-0.758	-7.62 ***	-0.581	-4.22 ***	-0.667	-7.95 ***	-0.925	-3.57 ***
2009	-0.914	-10.97 ***	-0.948	-7.75 ***	-0.888	-7.81 ***	-0.897	-10.79 ***	-1.280	-2.18 *

Significance indicators: ***(1%); **(5%); and *(10%).

Table IV

Ex Post Bond Performance: Benchmark-Adjusted Holding-Period Returns from Offer Price

This table shows mean and median benchmark-adjusted holding-period returns on new corporate bonds, Rba, for indicated horizons that begin on the issue date. t-values for means are shown in parentheses, while p-values from a Wilcoxon sign-rank test for median values are shown in brackets. The full sample here includes only bonds traded within 7 days of issuance.

Mean Benchmark-Adjusted Holding-Period Return from Offer Price to:									
First Trade ($Rba_{0,first}$)		1 month ($Rba_{0,1}$)		2 months ($Rba_{0,2}$)		6 months ($Rba_{0,6}$)		18 months ($Rba_{0,18}$)	
Mean (%)	Median (%)	Mean (%)	Median (%)	Mean (%)	Median (%)	Mean (%)	Median (%)	Mean (%)	Median (%)
Panel A: All Issues (N=790)									
0.687	0.470	1.162	0.769	1.153	0.792	0.639	0.635	-0.252	-0.537
(14.62)***	[0.000]***	(13.34)***	[0.000]***	(9.83)***	[0.000]***	(3.38)***	[0.000]***	(-0.79)	[0.260]
Panel B: Frequent Issuers (N=422)									
0.697	0.457	1.381	0.878	1.584	1.055	1.231	1.104	0.540	-0.143
(10.62)***	[0.000]***	(12.23)***	[0.000]***	(10.90)***	[0.000]***	(5.32)***	[0.000]***	(1.32)	[0.457]
Panel C: Infrequent Issuers N=368)									
0.675	0.496	0.910	0.643	0.658	0.669	-0.041	0.309	-1.160	-1.190
(10.06)***	[0.000]***	(6.80)***	[0.000]***	(3.54)***	[0.000]***	(-0.13)	[0.409]	(-2.37)**	[0.017]**
Panel D: Upper Investment-Grade Rating (AAA, AA, and A; N=319)									
0.702	0.445	1.470	0.948	1.590	1.131	1.431	1.531	1.394	0.814
(8.56)***	[0.000]***	(10.68)***	[0.000]***	(8.76)***	[0.000]***	(5.11)***	[0.000]***	(2.93)***	[0.010]***
Panel E: Lower Investment-Grade Rating (BBB; N=355)									
0.616	0.430	0.792	0.525	0.738	0.501	0.049	0.317	-1.656	-1.373
(9.73)***	[0.000]***	(6.62)***	[0.000]***	(4.77)***	[0.000]***	(0.19)	[0.235]	(-3.76)***	[0.000]***
Panel F: Speculative-Grade Rating (BB, B, and CCC; N=116)									
0.865	0.638	1.447	1.253	1.220	1.018	0.264	0.042	-0.480	-1.914
(7.33)***	[0.000]***	(5.49)***	[0.000]***	(3.07)***	[0.000]***	(0.4)	[0.582]	(-0.47)	[0.511]

Significance indicators: ***(1%); **(5%); and *(10%).

Table V

Ex Post Bond Price Performance: Benchmark-Adjusted Holding-Period Returns After First Month

This table shows mean and median benchmark-adjusted holding-period returns on new corporate bonds, Rba, for indicated horizons that begin one month after the issue date. t-values for means are shown in parentheses, while p-values from a Wilcoxon sign-rank test for median values are shown in brackets. The full sample here includes only bonds traded within 7 days of issuance.

Mean Benchmark-Adjusted Holding-Period Return from 1 Month After Issuance to:					
2 months ($Rba_{1,2}$)		6 months ($Rba_{1,6}$)		18 months ($Rba_{1,18}$)	
Mean (%)	Median (%)	Mean (%)	Median (%)	Mean (%)	Median (%)
Panel A: All Issues (N=790)					
-0.009	0.000	-0.523	0.000	-1.413	-1.267
(-0.14)	[0.323]	(-3.06)***	[0.035]**	(-4.64)***	[0.000]***
Panel B: Frequent Issuers (N=422)					
0.203	0.000	-0.151	0.049	-0.841	-0.904
(2.39)**	[0.083]*	(-0.69)	[0.877]	(-2.1)**	[0.026]**
Panel C: Infrequent Issuers (N=368)					
-0.252	0.000	-0.950	-0.208	-2.070	-1.525
(-2.43)**	[0.019]**	(-3.58)***	[0.001]***	(-4.47)***	[0.000]***
Panel D: Upper Investment-Grade Rating (AAA, AA, and A; N=319))					
0.120	0.000	-0.039	0.098	-0.075	-0.493
(1.14)	[0.679]	(-0.15)	[0.540]	(-0.16)	[0.715]
Panel E: Lower Investment-Grade Rating (BBB; N=355)					
-0.054	0.000	-0.743	-0.011	-2.448	-1.772
(-0.62)	[0.448]	(-3.00)***	[0.028]**	(-5.57)***	[0.000]***
Panel F: Speculative-Grade Rating (BB, B, and CCC; N=116)					
-0.227	-0.008	-1.183	-0.999	-1.927	-2.533
(-0.97)	[0.672]	(-2.18)**	[0.014]**	(-2.11)**	[0.045]**

Significance indicators: ***(1%); **(5%); and *(10%).

Table VI

Tests for Conditional Bond Return Reversal

This table shows results of a regression of the benchmark-adjusted holding-period return on a new corporate bond for the 17 months following the first month after issuance, ($Rba_{1,18}$), on its return in the first month after issuance ($Rba_{0,1}$). The regression is initially estimated using all observations and then re-estimated after splitting the data at the median of the offer-date discrepancy between the yield on the new bond and the yield on its benchmark index (Y-Yb). t-values are shown in parentheses.

$$Rba_{1,18} = a + b(Rba_{0,1}) + e$$

All Observations			(Y-Yb) < Median			(Y-Yb) ≥ Median		
a	b	Adj. R^2	a	b	Adj. R^2	a	b	Adj. R^2
Panel A: All Issues (N=790)								
-1.419	0.005	-0.001	-3.428	-0.326	0.008	0.707	0.132	-0.001
(-4.21)***	(0.04)		(-8.07)***	(-2.04)**		(1.40)	(0.72)	
Panel B: Frequent Issuers (N=422)								
-0.454	-0.280	0.004	-2.762	-0.677	0.038	2.059	-0.121	-0.004
(-0.97)	(-1.62)		(-4.82)***	(-3.04)***		(3.06)***	(-0.51)	
Panel C: Infrequent Issuers (N=368)								
-2.275	0.226	0.002	-3.761	-0.043	-0.005	-0.777	0.325	0.002
(-4.63)***	(1.25)		(-5.81)***	(-0.18)		(-1.04)	(1.17)	
Panel D: Upper Investment-Grade Rating (AAA, AA, and A; N=319)								
0.073	-0.101	-0.002	-3.637	-0.449	0.021	3.845	0.159	-0.004
(0.14)	(-0.54)		(-5.65)***	(-2.09)**		(5.74)***	(0.65)	
Panel E: Lower Investment-Grade Rating (BBB; N=355)								
-2.066	-0.483	0.014	-4.005	-0.887	0.060	-0.080	-0.341	0.003
(-4.46)***	(-2.49)**		(-6.89)***	(-3.50)***		(-0.11)	(-1.21)	
Panel F: Speculative-Grade Rating (BB, B, and CCC; N=116)								
-3.230	0.901	0.059	-3.044	1.012	0.067	-3.374	0.854	0.035
(-3.25)***	(2.87)***		(-2.49)**	(2.25)**		(-1.94)*	(1.75)*	

Significance indicators: ***(1%); **(5%); and *(10%).

Table VII

Short- and Long-Term Bond Price Performance as a Function of Yield Discrepancy

The initial columns show mean values of benchmark-adjusted returns on new corporate bonds for the first month after issuance ($Rba_{0,1}$) and for remaining months through 18 months after issuance ($Rba_{1,18}$), both for subsamples divided at the median of the offer-date discrepancy between the yield on the new bond and the yield on its benchmark index (Y-Yb). Subsequent columns show results of regressions of, alternately, $Rba_{0,1}$ and $Rba_{1,18}$, on (Y-Yb). Numbers in brackets are p-values from a Wilcoxon sign-rank test for median values of (Y-Yb). For all other statistics, t-values are shown in parentheses.

Y-Yb	Mean ($Rba_{0,1}$)			Mean ($Rba_{1,18}$)			$Rba_{0,1}$ = a1 + b1(Y-Yb) + e			$Rba_{1,18}$ = a2 + b2(Y-Yb) + e		
Median	(Y-Yb) < Median	(Y-Yb) ≥ Median	Diff.	(Y-Yb) < Median	(Y-Yb) ≥ Median	Diff.	a1	b1	Adj. R^2	a2	b2	Adj. R^2
Panel A: All Issues (N=790)												
-0.473	0.852	1.475	-0.623	-3.706	0.902	-4.608	1.351	0.325	0.016	0.461	3.219	0.139
[0.000]***	(6.72)***	(12.56)***	(-3.60)***	(-9.17)***	(2.12)**	(-7.85)***	(13.49)***	(3.74)***		(1.41)	(11.32)***	
Panel B: Frequent Issuers (N=422)												
-0.504	1.160	1.603	-0.443	-3.547	1.864	-5.411	1.440	0.096	-0.001	1.171	3.280	0.143
[0.000]***	(7.33)***	(10.00)***	(-1.97)*	(-6.81)***	(3.38)***	(-7.13)***	(10.73)***	(0.81)		(2.65)***	(8.45)***	
Panel C: Infrequent Issuers (N=368)												
-0.430	0.476	1.349	-0.873	-3.782	-0.339	-3.443	1.219	0.566	0.050	-0.316	3.207	0.138
[0.000]***	(2.40)**	(7.76)***	(-3.31)***	(-5.95)***	(-0.52)	(-3.78)***	(8.26)***	(4.49)***		(-0.65)	(7.72)***	
Panel D: Upper Investment-Grade Rating (AAA, AA, and A; N=319)												
-0.552	1.316	1.625	-0.309	-4.228	4.104	-8.332	1.435	-0.045	-0.003	3.941	5.190	0.315
[0.000]***	(6.17)***	(9.36)***	(-1.12)	(-7.24)***	(7.65)***	(-10.51)***	(7.86)***	(-0.29)		(7.81)***	(12.13)***	
Panel E: Lower Investment-Grade Rating (BBB; N=355)												
-0.446	0.477	1.109	-0.632	-4.427	-0.458	-3.969	1.041	0.498	0.035	-0.589	3.714	0.154
[0.000]***	(2.83)***	(6.66)***	(-2.67)***	(-7.55)***	(-0.74)	(-4.64)***	(7.71)***	(3.74)***		(-1.26)	(8.09)***	
Panel F: Speculative-Grade Rating (BB, B, and CCC; N=116)												
-0.170	0.590	2.304	-1.714	-2.447	-1.406	-1.041	1.643	0.645	0.096	-1.517	1.343	0.029
[0.067]*	(1.68)*	(6.36)***	(-3.40)***	(-1.98)*	(-1.04)	(-0.57)	(6.41)***	(3.63)***		(-1.65)	(2.10)**	

Significance indicators: ***(1%); **(5%); and *(10%).

Table VIII

Ex Ante and Ex Post Price Performance of the Stocks of Bond-Issuing Firms

The initial columns in this table show mean parameter estimates for the market model and the Fama-French three-factor model. For each new corporate bond in the sample, the parameters are estimated using monthly returns for months -18 to -1 relative to bond-issuance, month 0. The final columns in the table show cross-sectional mean and median values of monthly post-issuance average abnormal return (AARpost) from month 0 through month +18. Numbers in brackets are p-values from a Wilcoxon sign-rank test for median values of AARpost. For all other statistics, t-values are shown in parentheses.

Observations	ALPHA (%)	b(MKTRF)	s(SMB)	h(HML)	AARpost (%)	
					Mean	Median
		Panel A. Market Model				
Full Sample	0.656	0.993			-0.472	-0.398
	(12.20)***	(38.89)***			(-5.20)***	[0.000]***
Frequent Issuers	0.587	0.889			-0.178	-0.140
	(9.23)***	(28.46)***			(-1.54)	[0.290]
Infrequent Issuers	0.726	1.098			-0.769	-0.776
	(8.36)***	(27.49)***			(-5.54)***	[0.000]***
Initial TRACE Trade Within 7 Days	0.573	0.936			-0.251	-0.211
	(10.49)***	(36.46)***			(-2.66)***	[0.007]***
Initial TRACE Trade Later Than 7 Days	1.034	1.250			-1.470	-1.322
	(6.37)***	(16.19)***			(-5.90)***	[0.000]***
		Panel B. Fama-French Three-Factor Model				
Full Sample	0.490	0.964	0.174	0.184	-0.345	-0.261
	(8.44)***	(33.60)***	(4.60)***	(4.45)***	(-3.42)***	[0.001]***
Frequent Issuers	0.385	0.940	0.024	0.278	0.054	0.051
	(5.23)***	(26.21)***	(-0.49)	(5.01)***	-0.400	[0.284]
Infrequent Issuers	0.596	0.918	0.326	0.088	-0.748	-0.783
	(6.65)***	(22.02)***	(5.69)***	(1.45)	(-5.09)***	[0.000]***
Initial TRACE Trade Within 7 Days	0.437	0.941	0.109	0.136	-0.128	-0.100
	(7.29)***	(34.06)***	(2.81)***	(3.24)***	(-1.23)	[0.317]
Initial TRACE Trade Later Than 7 Days	0.729	1.069	0.469	0.399	-1.322	-1.193
	(4.29)***	(10.99)***	(4.18)***	(3.18)***	(-4.69)***	[0.000]***

Significance indicators: ***(1%); **(5%); and *(10%).

Table IX

Relating Ex Ante and Ex Post Stock Price Performance to Yield Discrepancy

The initial columns in this table show results of a regression of yield discrepancy at issuance, (Y-Yb), on the intercept, ALPHA, from pre-offering period estimation of either the market model of the Fama-French three-factor model applied to the issuing firm's stock. Subsequent columns show results from a cross-sectional regression of post-issuance average abnormal returns on the issuing-firm's stock, AARpost, on (Y-Yb). t-values are shown in parentheses.

Stock Pricing Model	(Y-Yb) = a1 + b1(ALPHA) + e			AARpost = a2 + b2(Y-Yb) + e		
	a1	b1	Adj. R^2	a2	b2	Adj. R^2
Panel A: All Issues (N=965)						
Market	-0.526	-0.086	0.019	-0.287	0.318	0.012
	(-15.11)***	(-4.43)***		(-2.76)***	(3.58)***	
Fama-French 3-Factor	-0.540	-0.087	0.023	-0.128	0.371	0.014
	(-16.11)***	(-4.82)***		(-1.11)	(3.77)***	
Panel B: Frequent Issuers (N=485)						
Market	-0.573	-0.089	0.014	-0.049	0.205	0.004
	(-11.95)***	(-2.83)***		(-0.36)	(1.74)*	
Fama-French 3-Factor	-0.600	-0.066	0.016	0.243	0.302	0.008
	(-13.17)***	(-2.42)**		-1.52	(2.19)**	
Panel C: Infrequent Issuers (N=480)						
Market	-0.477	-0.086	0.022	-0.531	0.441	0.021
	(-9.39)***	(-3.45)***		(-3.44)***	(3.37)***	
Fama-French 3-Factor	-0.478	-0.104	0.036	-0.497	0.464	0.021
	(-9.70)***	(-4.31)***		(-3.04)***	(3.36)***	
Panel D: Bonds with Initial Trade on TRACE within7 Days of Issuance (N=790)						
Market	-0.531	-0.090	0.018	-0.086	0.282	0.010
	(-14.17)***	(-3.93)***		(-0.79)	(2.99)***	
Fama-French 3-Factor	-0.545	-0.084	0.019	0.057	0.318	0.010
	(-15.06)***	(-4.06)***		(-0.47)	(3.04)***	
Panel E: Bonds not Traded on TRACE within 7 Days of Issuance (N=175)						
Market	-0.501	-0.080	0.018	-1.209	0.446	0.017
	(-5.42)***	(-2.06)**		(-4.33)***	(2.00)**	
Fama-French 3-Factor	-0.516	-0.093	0.030	-0.993	0.563	0.023
	(-5.93)***	(-2.52)**		(-3.15)***	(2.24)**	
Panel D: Upper Investment-Grade Rating (AAA, AA, and A; N=332))						
Market	-0.740	-0.124	0.027	0.390	0.444	0.033
	(-14.31)***	(-3.18)***		(2.55)**	(3.51)***	
Fama-French 3-Factor	-0.752	-0.118	0.030	0.733	0.636	0.047
	(-14.82)***	(-3.35)***		(3.97)***	(4.17)***	
Panel E: Lower Investment-Grade Rating (BBB; N=392)						
Market	-0.432	-0.091	0.020	0.030	0.366	0.015
	(-8.93)***	(-2.99)***		-0.22	(2.65)***	
Fama-French 3-Factor	-0.441	-0.105	0.030	0.069	0.394	0.017
	(-9.53)***	(-3.64)***		-0.48	(2.81)***	
Panel F: Speculative-Grade Rating (BB, B, and CCC; N=241)						
Market	-0.345	-0.100	0.028	-1.543	0.355	0.011
	(-3.82)***	(-2.80)***		(-6.14)***	(1.90)*	
Fama-French 3-Factor	-0.391	-0.081	0.021	-1.344	0.345	0.007
	(-4.59)***	(-2.49)**		(-4.66)***	(1.61)	

Significance indicators: ***(1%); **(5%); and *(10%).

Table X

Short- and Long-Term Bond Price Performance as a Function of ALPHA and (Y-Yb)

This table show results of a cross-sectional regression of the benchmark-adjusted holding period return on a new corporate bond for, alternately, the first month after issuance (Rba0,1) and the 17 months following the first month after issuance, (Rba1,18), either the intercept, ALPHA, from pre-offering period estimation of either the market model of the Fama-French three-factor model applied to the issuing firm's stock, or both ALPHA and the initial yield discrepancy (Y-Yb). t-values are shown in parentheses.

Stock Pricing Model	$Rba_{0,1}$ = a1 + b1(ALPHA)+ c1(Y-Yb) + e				$Rba_{1,18}$ = a2 + b2(ALPHA) + c2(Y-Yb) + e			
	a1	b1	c1	Adj. R^2	a2	b2	c2	Adj. R^2
				Panel A: All Issues (N=790)				
Market	1.148	0.024		-0.001	-1.176	-0.415		0.004
	(12.34)***	(0.42)			(-3.62)***	(-2.09)**		
	1.327	0.054	0.337	0.016	0.518	-0.128	3.192	0.138
	(12.84)***	(0.95)	(3.84)***		(1.53)	(-0.69)	(11.11)***	
Fama-French Three-Factor	1.165	-0.008		-0.001	-1.158	-0.585		0.012
	(12.94)***	(-0.15)			(-3.70)***	(-3.25)***		
	1.345	0.020	0.330	0.015	0.556	-0.319	3.142	0.142
	(13.27)***	(0.38)	(3.76)***		(1.68)*	(-1.89)*	(10.95)***	
				Panel B: Frequent Issuers (N=422)				
Market	1.377	0.009		-0.002	-0.843	0.004		-0.002
	(11.38)***	(0.11)			(-1.96)**	(0.01)		
	1.433	0.020	0.100	-0.003	1.030	0.372	3.363	0.145
	(10.37)***	(0.24)	(0.84)		(2.27)**	(1.34)	(8.56)***	
Fama-French Three-Factor	1.373	0.023		-0.002	-0.675	-0.446		0.005
	(11.82)***	(0.33)			(-1.64)	(-1.79)*		
	1.433	0.032	0.104	-0.003	1.206	-0.159	3.241	0.142
	(10.59)***	(0.45)	(0.87)		(2.71)***	(-0.68)	(8.25)***	
				Panel C: Infrequent Issuers (N=368)				
Market	0.881	0.045		-0.002	-1.629	-0.690		0.015
	(6.16)***	(0.57)			(-3.32)***	(-2.57)**		
	1.172	0.090	0.585	0.051	-0.081	-0.449	3.112	0.143
	(7.67)***	(1.17)	(4.60)***		(-0.16)	(-1.78)*	(7.45)***	
Fama-French Three-Factor	0.923	-0.026		-0.002	-1.719	-0.688		0.016
	(6.62)***	(-0.35)			(-3.60)***	(-2.65)***		
	1.211	0.021	0.571	0.047	-0.153	-0.432	3.103	0.143
	(8.05)***	(0.28)	(4.48)***		(-0.31)	(-1.77)*	(7.42)***	
				Panel D: Upper Investment-Grade Rating (AAA, AA, and A; N=319))				
Market	1.443	0.076		-0.002	0.130	-0.579		0.005
	(10.10)***	(0.70)			(0.27)	(-1.61)		
	1.422	0.073	-0.028	-0.005	3.937	0.025	5.196	0.313
	(7.74)***	(0.66)	(-0.18)		(7.75)***	(0.08)	(11.96)***	
Fama-French Three-Factor	1.458	0.040		-0.003	0.166	-0.825		
	(10.35)***	(0.40)			(0.36)	(-2.47)**		
	1.432	0.036	-0.035	-0.006	3.960	-0.231	5.127	0.314
	(7.82)***	(0.35)	(-0.23)		(7.84)***	(-0.82)	(11.79)***	
				Panel E: Lower Investment-Grade Rating (BBB; N=355)				
Market	0.786	0.009		-0.003	-2.382	-0.108		-0.003
	(6.03)***	(0.11)			(-4.97)***	(-0.35)		
	1.012	0.060	0.513	0.034	-0.717	0.267	3.783	0.154
	(7.18)***	(0.72)	(3.80)***		(-1.48)	(0.93)	(8.14)***	
Fama-French Three-Factor	0.854	-0.131		0.005	-2.324	-0.261		-0.001
	(6.85)***	(-1.69)*			(-5.05)***	(-0.92)		
	1.063	-0.075	0.470	0.035	-0.643	0.186	3.781	0.153
	(7.76)***	(-0.97)	(3.46)***		(-1.36)***	(0.70)	(8.06)***	
				Panel F: Speculative-Grade Rating (BB, B, and CCC; N=116)				
Market	1.431	0.015		-0.009	-1.459	-0.445		0.002
	(4.89)***	(0.13)			(-1.44)	(-1.08)		
	1.555	0.091	0.671	0.093	-1.225	-0.303	1.257	0.025
	(5.56)***	(0.79)	(3.70)***		(-1.22)	(-0.73)	(1.93)*	
Fama-French Three-Factor	1.374	0.101		0.000	-1.462	-0.648		0.021
	(5.03)***	(1.00)			(-1.56)	(-1.86)*		
	1.554	0.135	0.668	0.103	-1.128	-0.586	1.243	0.045
	(5.90)***	(1.39)	(3.76)***		(-1.20)	(-1.70)*	(1.95)*	

Significance indicators: ***(1%); **(5%); and *(10%).

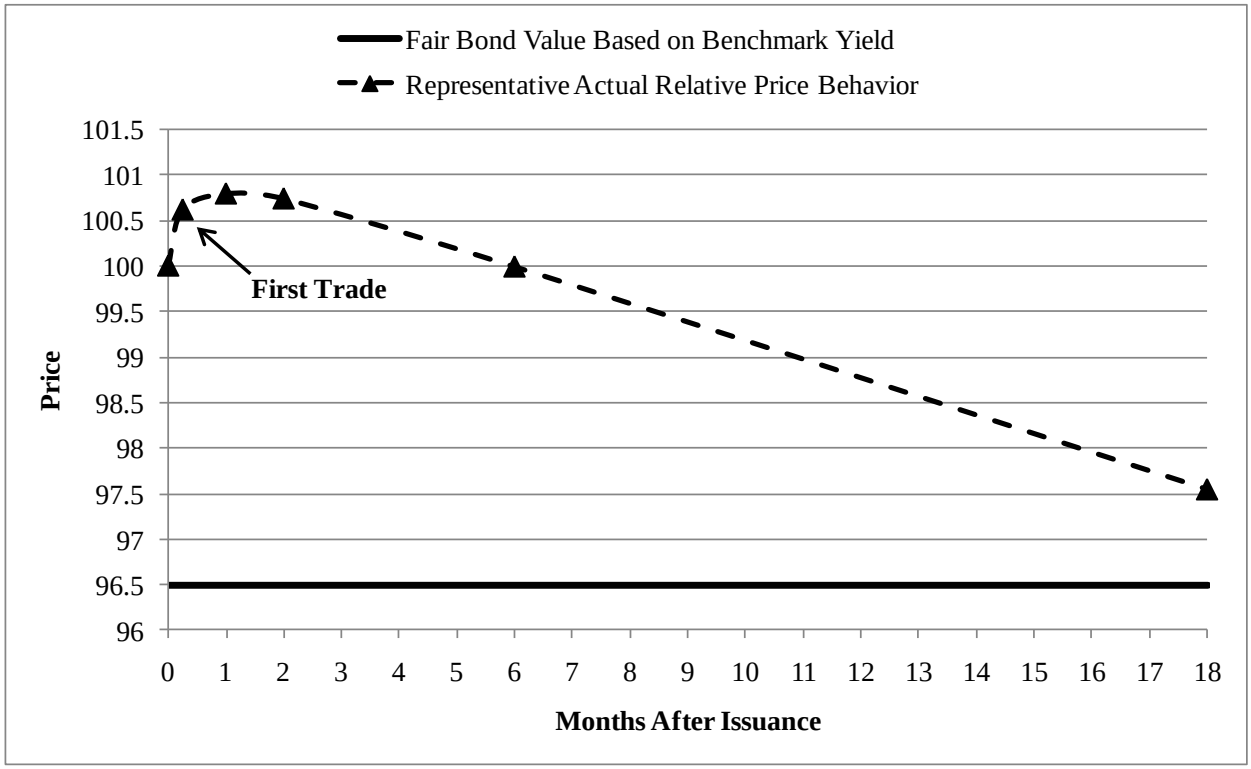

Figure 1. Representative Relative Price Behavior of New BBB-Rated Bonds.