Determinants of Corporate Bond Trading: A Comprehensive Analysis.

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Abstract

This paper studies the trading volume and liquidity of corporate bonds using a unique dataset of insurance company trades. The analysis covers more than 17,000 US corporate bonds of 4,151 companies from January 1995 to December 1999. Most corporate bonds trade in dealer markets in which transactions prices and trading volume are usually unobservable. Hence, previous studies have used yield spreads as proxies for liquidity or have based their findings on limited samples of bonds. Our dataset allows us to study the effect of a variety of issue- and issuer-specific characteristics on liquidity in the broader corporate bond market. Consistent with previous findings, we determine that larger and newer issues do trade the most. In contrast to Alexander et al. (2000), our results show that bonds of companies with publicly traded equity trade more than those with private equity. Further, public companies with more active stocks have more actively traded bonds. We analyze high- and low-grade bonds separately to find that credit risk increase trading in investment-grade bonds but reduce trading in high-yield bonds. Overall, equity market shocks decrease bond trading, while changes in long-term Treasury rates induce more trading in long-maturity corporate bonds and less trading in short-maturity bonds.

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1 Introduction

This paper presents the most comprehensive study to date of trading activity in the corporate bond market. We analyze the determinants of trading volume for over 17,000 investment-grade and high-yield bonds of public and private firms over a 60-month period from January 1995 to December 1999. Researchers and practitioners have long hypothesized as to how particular bond characteristics or market conditions are related to liquidity. Recently available transactions data for insurance company trades in this market allows us to provide meaningful estimates of the significance and magnitude of these effects.

Bonds are primarily traded in a non-centralized dealer market, where investors shop between dealers for the best quotes. As a result, transaction data are generally unavailable. However, two recently compiled transaction datasets have enabled researchers to begin studying trading practices in this market. The *Fixed Income Pricing System* (FIPS) contains transaction information collected by the NASD for a relatively small number of high-yield bonds; this dataset has been used by Alexander, Edwards, and Ferri (AEF, 2000) to study determinants of trading volume and by Hotchkiss and Ronen (1999) to test the informational efficiency of the market. The second recently available database, which we use in this study, is based on information on bond trades reported to the *National Association of Insurance Commissioners* (NAIC). The NAIC database is significantly more comprehensive and includes daily transactions data on more than 30,000 bonds. It has previously been used to estimate realized bid-ask spreads for the most actively traded corporate bonds (Chakravarty and Sarkar (CS, 1999), Hong and Warga (HW,2000), and Schultz (2001)). In this study, we use the NAIC data to study trading volume as a measure of corporate bond liquidity.

Liquidity is defined as the ability to trade quickly at a low cost (O'Hara, 1995, p.216). Previous literature suggests three ways of measuring liquidity: through the bid-ask spread, trading volume, and the price impact of large trades. Prior to the availability of any transactions based databases, studies largely used yield spreads or issue size (Sarig and Warga (1989), Blume, Keim, and Patel (1991), and Crabbe and Turner (1995)) as proxies of bond liquidity, but no data was available to demonstrate a relationship between issue size and more direct measures of liquidity. Further, yield spreads compensate for credit risk in addition to liquidity risk. The recently available NAIC database has enabled researchers to measure liquidity through realized bid-ask spreads, as data on quotes is still not available. CS and HW estimate bid-ask spreads based on transactions identified as buys vs. sells for the most actively traded bonds in the NAIC dataset[1]. Because of infrequent trading in corporate

[1] Schultz (2001) provides estimates for a larger sample of bond by inferring prices when bonds do not

bonds, there is not sufficient intraday data for meaningful estimates of price impact as a liquidity measure. Our paper focuses on the third measure of liquidity, trading volume.

Using trading volume as a proxy for liquidity is supported by two theoretical arguments. First, the 'inventory paradigm' of Demsetz (1968), Stoll (1989), Ho and Stoll (1981) suggests that liquidity depends on the cost of financing dealer inventories. Based on this paradigm, AEF argue that inventory costs for low-trading bonds are likely to be higher and are passed on to the investor in the form of higher bid-ask spreads. Low trading volume and high bid-ask spreads both indicate low liquidity, but realized bid-ask spreads are compensating for risk factors in addition to liquidity (see CS). Moreover, Grossman and Miller (1988) theorize that realized spreads provide compensation to dealers to cover the execution cost of the trade rather than compensation for providing liquidity. Second, Kamara (1994) develops a measure of 'immediacy risk' which incorporates trading volume directly. Immediacy risk is the risk of adverse price moves by the time the transaction is executed. This risk is directly related to the price volatility of the bond and the time needed to execute a trade. Higher trading volume reduces both execution time and the risk of an adverse price move.

There are two critiques of using trading volume as a liquidity proxy. First, critics of trading volume argue that the volume of large trades, rather than total volume, is a better measure of liquidity[2]. However, AEF find that large trades, small trades, and total volume are highly correlated, making all three bond liquidity measures close substitutes in bond markets. Second, trading volume does not explicitly incorporate trading costs, which falls short of fully satisfying O'Hara's definition of liquidity. While CS find a significant negative correlation between trading volume and realized bid-ask spreads, there are important exceptions. Bamber (1986) and Krinsky and Lee (1996) observe that around earning announcements both volume and bid-ask spreads are high, which raises questions about the use of both measures as proxies for liquidity. The theoretical literature[3] argues that increased trading in this situation is not liquidity driven, but rather 'speculation driven', and results from investors' differences in interpreting economic news. Like AEF, we estimate this 'speculative component' of trading volume through the risk characteristics (interest-rate, volatility, and credit risk) of corporate bonds.

Our comprehensive trading volume dataset allows us to consider a large number of

trade using a database of monthly bond quotes provided by Lehman Brothers. Details of the various data sources are provided in Section 3.

[2]Madhavan and Cheng (1997) and Keim and Madhavan (1996) believe that the ability to execute large trades with little price impact reveals better the depth of the market.

[3]The list includes Harris and Raviv (1993), Bachelier (1900), Bamber, Barron, and Stober (1999), Kandel and Pearson (1995), Kyle (1985), and Admati and Pfeiderer (1988).

bond characteristics suggested by previous studies to affect liquidity and to test a wider range of hypotheses. Investment-grade and high-yield bonds are analyzed separately. From the NAIC data, for each month a bond is outstanding, we calculate the par amount traded (which is frequently zero) standardized by the bond's total amount outstanding. We estimate tobit regressions explaining the monthly volume of trade as well as logit regressions explaining whether a bond trades in a particular month. Our limited dependent variable methodology allows us to handle the problem of irregularly spaced data due to the generally infrequent trading of corporate bonds. We estimate the relative sensitivity of monthly trading volume to issue- and issuer-specific characteristics, as well as to changes in general financial market conditions. Consistent with previous research, we find that the issue's size and age are the two most important determinants of liquidity. For example, a \$150 million (\$190 million)[4] increase in amount outstanding increases the probability of trade in a given month for investment-grade (high-yield) bonds from 35.7% (25.4%) to 55.5% (35.9%), while a 5.5 years (4 years)[5] increase in the bond's age reduces the probability by 5.6% (3.6%). We also compare the trading activity of bonds with privately and publicly held equity and, in contrast to AEF's findings for a smaller sample high yield bonds, we find that bonds of firms with private equity trade significantly less than their public counterparts. We also find a strong correlation between trading volume of the equity and debt of firms with publicly traded equity. Finally, we observe that large return shocks in the stock market induce less trading in the bond market, while changes in long-term Treasury rates generate more trading particularly for longer-maturity corporate bonds.

The rest of the paper is organized as follows: the next section motivates the variables used to explain corporate bond trading and presents some evidence from previous studies. Section 3 describes our dataset of insurance company trades, as well as additional datasets used in this study, and discusses the bond trading patterns observed in our sample of bonds. Section 4 presents the model and estimation methodology. Section 5 discusses the results and the last section concludes the paper. For the interested reader, the appendix presents additional details and intuition on the modeling approach used in the study.

[4]The average amount outstanding across all investment-grade (high-yield) bonds is \$130 million (\$150 million), while the standard deviation of amount outstanding in the sample is \$150 million (\$190 million).

[5]The average age of investment-grade (high-yield) bonds is 4.4 (3.5) years, while the standard deviation of the age variable in the sample is 5.5 (4) years.

2 Potential determinants of corporate bond trading

This section motivates the choice of bond and stock variables used to explain liquidity in US corporate bond markets. We review hypotheses about their expected impact on trading and the available evidence from previous studies.

- *Issue size.* Following the inventory paradigm argument, it is hypothesized that size should have a significant positive impact on bond liquidity as dealers can more easily manage their inventory of larger issues. While studies using yield spreads to proxy liquidity[6] find little support for this hypothesis, Hong and Warga (2000) show that larger issues have significantly tighter bid-ask spreads. For the 57 FIPS-traded bonds, AEF find that larger issues do have higher trading volume.

- *Age of bond.* AEF and Warga (1992) argue that as a bond becomes more seasoned it becomes less liquid as inactive portfolios absorb more and more of the original issue, leaving less and less available to trade. Indeed, the evidence suggests that yield spreads (Sarig and Warga (1989) and Warga (1992)) and bid-ask spreads (CS, Hong and Warga (2000) and Schultz (2001)) increase and trading volume (AEF) decreases as the bond ages.

- *Interest-rate risk.* As in AEF, we test whether bonds with higher interest-rate risk have a stronger speculative trading component. The theoretical literature (Harris and Raviv (1993) and Kandel and Pearson (1995)) suggests that differences in investors' forecasts should lead to speculative trading using the issues with highest duration.

- *Credit risk.* Similarly, speculation about changes in the bond's credit quality around earning announcements or major macroeconomic news should induce more trading in corporate bonds. AEF notice more trading in high-yield bonds with higher credit risk.

- *Price volatility.* Harris and Raviv (1993) theorize that trading volume is positively affected by return shocks, because price volatility reflects differences in investors' opinions, which in turn induces more speculative trading. Consistent with this hypothesis, AEF find bond trading to increase with bond return volatility.

- *Publicly vs. privately traded equity.* Only a portion of corporate bonds in our sample have publicly traded equity. While all registered firms are required to disclose material information to the SEC, the disclosure requirements are much more stringent for firms

[6] Warga (1992), Crabbe and Turner (1995), and Fridson and Garman (1998).

with publicly held equity. As a result, more information is available on public equity firms, hence reducing the cost of adverse selection for market makers in those bonds and increasing their liquidity. Fenn (2000) finds that private firms do pay a yield premium over firms with public equity. We expect more information induced trading for public than for private equity firms. Surprisingly, for the 57 FIPS-listed bonds, AEF find the opposite result.

- *Equity trading volume and return.* Firm-specific news should affect trading in both the equity and debt of a firm. For bonds of companies with publicly traded equity, we investigate the correlation between stock activity and bond liquidity. Based on the high-yield bond data from FIPS, Hotchkiss and Ronen (1999) do find support for the hypothesis that bond and stock returns react jointly to common factors. In contrast, Kwan (1996) finds that only past stock returns are correlated with current bond yield changes.

- *Equity market conditions.* Financial market conditions influence bond trading as investors optimize and rebalance their portfolios in light of new information. The literature on the relationship between market volatility and liquidity is divided. While Gallant, Rossi, and Tauchen (1992) observe a positive correlation between market volatility and trading volume of NYSE-traded stocks, Chordia, Roll, and Subrahmanyam (2000) and Engle and Lange (1997) find the opposite result.

- *Changes in long-term interest rates.* The price of fixed-income instruments is directly affected by changes in interest rates. We expect to see more active trading when interest-rate changes are larger. The interest-rate effect should be stronger for higher-duration bonds as their price is more responsive to interest-rate changes.

- *Embedded options.* Some corporate bonds in our sample have attached call option features which protect the issuer from adverse movements in interest rates. This implied insurance is expected to reduce the interest-rate effect on bond prices, and hence reduce price induced trading.

- *Industry of the issuer.* Trading activity may be different across industry groups due to differences in industry transparency, regulation, or market outlook.

The data and results sections motivate the specific variables used to proxy for the above issue and issuer characteristics and describe the data sources used to obtain them.

3 Data

The dataset for this study is obtained from four databases: the *National Association of Insurance Commissioners* Database (**NAIC)**, the *Fixed Investment Securities Database* (**FISD)**, the *Lehman Database*, and **CRSP**. The former three databases contain bond related data, while CRSP is used to extract the corresponding equity return and volume data as well as marketwide stock and bond index returns.

The NAIC provides all bond trading volume information for this study. This data has also been used by Schultz (2001), Chakravarty and Sarkar (1999), and Hong and Warga (2000) to study corporate bond trading costs. The prior studies use data sold by *Capital Access*, which obtains the majority of its data from NAIC, but also includes data obtained from Morningstar and voluntary contributions by mutual and pension funds. At the beginning of 1995, the National Association of Insurance Commissioners began providing, in electronic format[7], transaction information on bonds traded by insurance companies. Insurance companies are required to report all trades on Schedule D filings with the NAIC every quarter. The NAIC database covers trades on 30,000 corporate, municipal, and government bond issues in the period between January 1995 and December 1999. Our analysis concentrates on US corporate bonds which reduces the number of issues covered to about 18,400 for the same period. While the NAIC database includes only insurance company trades, it is still the most comprehensive source of information to date on corporate bond trading, and covers a significant portion of the market for corporate debt. Hong and Warga (2000) report that insurance companies account for roughly 25% of the market for non-investment grade debt, while their share of trading in the investment-grade debt market is around 40%. Further, Schultz (2001) estimates that life insurance companies by themselves hold about 40% of all corporate bonds.

The *NAIC database* provides information on the transaction date, the par value traded, the type of order (buy or sell), and the dealer who executed the trade. The total par value of corporate bonds traded reported in NAIC amounts to $2,334 trillion ($1,282 trillion buy trades and $1,052 trillion sell trades) between January 1995 and December 1999; this corresponds to 685,670 transactions (376,717 buy and 308,953 sell trades). We exclude from our sample all transactions that are not date-stamped and do not specify the trader through which the transaction is executed[8]. Such transactions represent 2.39% of the total

[7]This data was available before 1995, but not in an electronic format.

[8]Transactions that are not associated with any specific dealer are marked as 'various'. Such trades have either been executed through several dealers, or the insurance company has reported on one date all trades executed in the preceding quarter. We exclude such transactions, because they may overstate the turnover

reported transactions (2.77% of buy and 1.92% of sell transactions) in the NAIC database. In addition, all convertible, asset-backed, and letter-of-credit backed bonds are excluded. After filtering, our sample contains 17,113 US corporate bonds that are either regular debentures, medium-term notes, or zero coupon bonds.

We aggregate all buy and sell transactions in a given month to calculate the total buy-, total sell- and combined par value traded for any given issue (we call those variables *Dollar Buy Volume, Dollar Sell Volume*, and *Dollar Volume*[9] ('Dollar' is used here to reflect that these par value quantities are reported in dollars, not to imply that these are the actual dollar *price* of the trades)). We then standardize the total *Dollar Volume* by the amount outstanding of the issue at the end of the month. The *volume* variable, our dependent variable, thus represents the *percentage* of the amount outstanding traded per month:

$$volume = \frac{\$ \text{ par value traded}}{\$ \text{ amount outstanding}} = \frac{\text{Dollar Volume}}{\text{Amount Outstanding}}. \tag{1}$$

The *FISD database* provides comprehensive bond-specific data including the amount outstanding history, S&P rating history, industry classification, call features, issue and maturity dates. We use the issue and maturity information to compute the age and remaining time-to-maturity (both in years) of each issue in any month.

The *Lehman database* is a comprehensive set of bond prices for the past 25 years maintained by Lehman Brothers for the purpose of constructing its widely used benchmark bond indexes. This data is provided through the *Fixed Income Research program* at the College of Business Administration of the University of Houston (see Warga (1998)). Further details on this database are available in Hong and Warga (2000). We use all bond return data available and match it to the combined dataset obtained from NAIC and FISD. We do not exclude bond issues from the previously combined database if no return information is provided in the Lehman database; rather, we analyze the effect of including this variable in our sample on the resulting marginal effects of the remaining variables.

Finally, the *CRSP database* is used to extract stock information for bonds of firms with traded equity. For each month and each bond, we match the corresponding monthly stock return and stock volume information. We extract both contemporaneous and lagged stock data, and include up to three lags to control for monthly autocorrelation in both returns and volume. We do not exclude bonds from our sample if they do not have a traded stock.

in the month of reporting. Unlike the Capital Access data, we do not find a pattern or specific dates on which most of these transactions are reported in NAIC.

[9]If a bond is traded by insurance companies in the period of January 1995 to December 1999 and it is still outstanding in a given month in the sample, it is included in our sample even if it does not trade in that month and we assign it a trading volume of zero for that month.

Instead, we include a dummy indicating whether the company has traded equity to study its effect on bond trading.

Table 1 summarizes the variables used by database source, as well as the number of bond-month observations extracted from each. The maximum number of bond-month data in our set comes from matching the NAIC data with the FISD data, resulting in a total of 719,190 bond-month observations on volume and bond characteristics[10]. Unfortunately, the Lehman database is not as comprehensive and only covers the period of January 1995 to May 1998[11]. As a result we obtain only 235,881 bond-month observations with return data available. Many of the bonds in our sample do not have publicly traded equity. 1,358 of the 4,151 companies in the sample, or 32.7%, have public equity included on CRSP, resulting in 166,639 stock-month data points. This number contrasts sharply with that of AEF where 91% of the 57 bonds traded on FIPS have publicly traded equity.

We further subdivide the sample into investment-grade and high-yield bonds. Table 2 illustrates the frequency distribution of monthly volume observations for both categories of bonds. 79.4% of the bond-month observations on trading volume in the investment-grade subsample and 84.1% of the observations in the high-yield bond subsample are zero. We expect high-yield bonds to trade less frequently in our sample, since insurance companies are not as active in this segment of the market. For bonds with publicly traded equity, the proportions are smaller - 66.7% of investment-grade bond-month observations and 79.1% of high-yield bond-month observations on volume are zero. In months when a bond trades, the proportion traded that month is also relatively small - generally less than 5% of par value outstanding. However, we find that the size of an average individual buy or sell transaction is quite large, $2.88 and $2.81 million in par value[12], respectively. CS find the mean transaction size to be $4.4 million, while the median in Schultz is $1.5 million.

The last column of Table 2 shows the trading frequency for stocks. Unlike bonds, stocks have a more even distribution of trading volume. There are only 18 observations (out of a total of 166,639 stock-month observations) in which a stock did not trade for a particular month. About 70% of stocks trade about 1-10% of their total shares outstanding each month, and more than 95% of the stocks trade 1-50% of their shares outstanding per month. The table illustrates that equities have a much more regular trading pattern than bonds, 95% of which trade less than 5% of their amount outstanding each month.

[10]This includes observations of zero volume for months where bonds are outstanding based on the FISD information.

[11]May 1998 is the last month for which Lehman Brothers made their data publicly available.

[12]The mean is taken across all actual transactions in the database, not across all bond-observations (some of which reflect zero trading volume) and hence represents the mean across bonds that actually traded.

Table 3 presents the total buy and sell dollar volumes (*Dollar Buy Volume* and *Dollar Sell Volume* in millions of dollars) by insurance companies averaged for each calendar month. Note that the most par value is traded in December ($21.4 billion total, $11.4 billion buy, and $9.9 billion sell volumes) and the least is traded in August ($14 billion total, $7.3 billion buy, and $6.7 billion sell volumes). The *number* of buy and sell trades by insurance companies, also averaged across the five years for each calendar month in the sample, are lowest again in August (2,640 buy and 2,232 sell trades on average per month) and increase towards the end of the year (highest in December - 4,036 buy and 3,716 sell trades per month). This result suggests that we may be observing tax-motivated trading at year end. However, the monthly *Dollar Sell Volume* is lower than the monthly *Dollar Buy Volume* in the last two quarters. Insurance companies are selling less bonds than they are buying in most months, but the difference is not as large as in Schultz (2001) who finds that buy orders are twice as common as sell orders. Schultz's (2001) sample, however, includes some trades by mutual and pension funds. We find that over the period 1995 to 1999, insurance companies have bought on average $ 8,871 million and sold $ 8,195 million worth of par value outstanding per month. This is consistent with the idea that insurance companies buy bonds and hold some of them to call or expiration, contributing to our expectation that volume of trade declines with bond age as bonds are absorbed into inactive portfolios.

Table 4 shows that insurance companies have been involved in more buying than selling activity in all years but in 1999. *Total Dollar Buy Volume* is larger than *Total Dollar Sell Volume* per year between 1995 and 1998. However, the proportion of sell to buy volume has been rapidly increasing from 63% in 1995 to 185% in 1999. The same is true for the proportion of sell to buy trades which increased from 74% in 1995 to 150% in 1999. Table 4 also shows that total dollar trading volume by insurance companies rapidly increased from $ 152.3 billion in 1995 to $ 303.1 billion in 1998, but dropped back to $ 190.57 billion in 1999. Both the total dollar amount of bonds outstanding and the number of bond issues outstanding traded by insurance companies increased throughout all years of the sample, however, both quantities grew relatively little in 1999. While total amount outstanding in our sample was growing by 22% to 30% per year between 1995 and 1998, it only grew by 8% in 1999. Similarly, while the number of corporate issues in our sample was growing at 25% in 1996, the growth in 1999 was only 1%. The rapid growth in new issues in the years 1995-1998 is also reflected in the reduction in the average age of our bond sample from 4.28 years to 3.95 years during the period, but the drop in net new issues growth in 1999 reversed this trend to make the average age 4.51 years. The negative correlation between the average age of our bond sample and total trading activity by insurance companies is consistent with

our initial hypothesis that bond trading falls in the bond's age.

The distribution of age and time-to-maturity of the bond-month observations in the sample is presented in Table 5. Most bond-month observations in the sample tend to be of relatively new issues, and there are progressively less bond-month data as the age category becomes large. 19% of all bond-month points in the sample represent bonds that are less than a year old, and 56% are bonds that are less than three-years old. In contrast, there seems to be a significant number of bond-month observations across all time-to-maturity categories.

Table 6 illustrates the distribution of bond-month observations across industry groups, based on classification of bonds as industrial, financial, or utility by the FISD database. About two-thirds of high-yield bond-month observations are for bonds issued by industrial firms, 19% come from the financial sector and 15% from utilities. Investment-grade bond-month data are more evenly distributed across industries - 34%, 42%, and 24% for bonds issued by industrial, financial, and utility firms, respectively.

We split the sample into investment-grade and high-yield bond-month observations by the bond's S&P rating obtained from FISD (rating above BBB- are considered investment-grade). Descriptive statistics of the bond and stock variables used in the study are presented in Table 7. Insurance companies trade about twice as much investment-grade bonds as high-yield bonds - on average 1.64% vs. 0.94% of amount outstanding traded per bond per month, respectively. High-yield bonds traded by insurance companies tend to be newer issues (3.51 years old on average) than investment-grade bonds (4.39 years on average). A similar pattern is observed for the time-to-maturity characteristic - insurance companies trade investment-grade bonds with an average time-to-maturity of 9.44 years and high-yield bonds with an average time-to-maturity of 7.19 years. High-yield bonds traded by insurance companies are more than twice as likely to be callable - 23% of investment-grade bond-month observations are of callable bonds vs. 58% of high-yield bonds. As expected, high-yield bonds have higher price volatility - the mean (standard deviation) of the absolute bond returns is 0.87% (1.57%) for investment-grade bonds and 1.11% (3.91%) for high-yield bonds). Also the equity of high-yield bonds seems to trade more than that of investment-grade bonds. The remaining characteristics do not differ considerably across the two samples.

4 Model and Methodology

Unlike stocks, most corporate bonds trade infrequently and some become part of inactive portfolios as they become more seasoned. 79.4% of bond-month observations on trading volume are zero in our investment-grade sample and 84.1% are zero for the high-yield sample. As a result, our dependent variable, bond trading volume, is severely censored and most observations are clustered at zero.

OLS regressions produce biased parameter estimates when the dependent variable has such a severely truncated distribution. The OLS regression coefficients are biased downward since the censoring of the dependent variable above zero restricts the error terms and makes the conditional expectation of the error term different from zero:

$$E[e|e < -X\beta] > 0. \tag{2}$$

This violates the key identifying OLS assumption of independence between the OLS errors and the explanatory variables.

To account for the distribution of trading volume, we use two limited-dependent-variable models to consistently estimate the effect of each independent variable on bond trading. Such models also deal with the problem of irregularly spaced trades in our sample.

4.1 Modeling the expected trading volume: a tobit approach

The tobit regression model is specifically designed for estimation where dependent variables are observed only over some range. The literature on estimating the parameters of truncated normal distributions is extensive. However, Tobin (58) is the first to discuss this problem in a regression context. Details on the estimation and parameter interpretation of Tobit coefficients are presented in the appendix. Here we present the basic structure of the model.

The tobit model is formalized as:

$$\begin{aligned} y^*_{it} &= \beta \mathbf{X}_{it} + \varepsilon_{it} && \varepsilon_{it} \sim N(0, \sigma^2) \\ y_{it} &= y^*_{it} && \text{if } y^*_{it} > 0 \\ y_{it} &= 0 && \text{if } y^*_{it} \leq 0 \end{aligned} \tag{3}$$

where y^*_{it} is a scalar representing the *desired trade volume* in bond i in month t, y_{it} is a scalar corresponding to the *actual trade volume*, $\mathbf{X}_{it}$ is an $m \times 1$ vector of explanatory variables specific to bond i at time t, β is a $1 \times m$ vector of sensitivities of the latent variable, y^*_{it}, to the explanatory variables. Due to the large number of bond-month observations in our

sample, it is reasonable to assume normality of the error terms, ε_{it}, necessary for the MLE estimation of the model.

The *desire to trade* can be viewed as a latent variable, y^*, which is a linear function of the explanatory variables. Whenever the desire to trade is positive, a bond trades, and the *actual* trade size, y, is equal to the *desired* level of trade, y^*. If the *desire* to trade is null or negative, the *actual* trade volume is zero. The distinction between observed and latent trading is here only a model construct aimed at correcting the bias introduced by the truncated distribution of the dependent variable. However, the distinction is important for interpreting the regression coefficients. The estimated beta coefficients show the sensitivity of the latent y^*, not the observed y (trading volume) to changes in the explanatory variables. The effect on actual trading volume is a positive function of those coefficients but also depends on the level of the explanatory variables. The hypothesis tests rely on the sign and significance of each coefficient, not its magnitude. Details on the coefficient interpretation are provided in the appendix.

Given the large number of observations, standard errors and p-values might not be a good indication of the economic significance of each explanatory variable[13]. To assess the latter, we estimate the marginal change in expected trading volume induced by a one-standard-deviation change in each explanatory variable. This exercise involves calculating the expected trading volume, $E(y)$, at the average $\mathbf{X}$ values and then moving each X_{ijt} element of $\mathbf{X}_{it}$ individually by one-standard-deviation, holding the other variables constant. This allows us to estimate the change in $E(y)$ induced by one-standard-deviation change in each variable, which gives us an indication of the economic significance of the corresponding variable. The econometric details of this exercise are provided in the appendix.

4.2 Modeling the probability of trade: the logit approach

A second approach for understanding liquidity is to measure to effect of the explanatory variables considered on a bond's *probability of trade*. The logit regression model is well suited for this purpose. Volume of trade, y, is discretized into a binary response which takes the value of 1 if the bond trades in the particular month and 0 otherwise. Although information is lost by discretizing a continuous variable, the logit model produces consistent estimates of the coefficients of the explanatory variables and hence of the effect of the explanatory variables on trading.

[13]We may also have a dependence problem, since we do not include fixed effects per bond. Given the large number of observations, including fixed effects significantly reduces the degrees of freedom.

The logit model estimates the *probability* of trade by using the latent variable framework of the tobit model discussed in the previous section:

$$\begin{aligned} y_{it}^{*} &= \beta \mathbf{X}_{it} + \varepsilon_{it} && \varepsilon_{it} \sim N(0, \sigma^2) && (4) \\ y_{it} &= 1 && \text{if } y_{it}^{*} > 0 && \text{(the bond trades)} \\ y_{it} &= 0 && \text{if } y_{it}^{*} \leq 0 && \text{(the bond doesn't trade)} \end{aligned}$$

A logit model provides unbiased estimates of the sensitivities to the explanatory variables when the dependent variable has a truncated distribution.

Again, we evaluate the economic significance of each explanatory variable by measuring the marginal change in $E(y)$ with respect to a one-standard-deviation move in each variable. We estimate this marginal effect at the average values of the explanatory variables. In the logit case, $\Delta E(y) = \Delta p$ as y can take the values of 0 or 1. Therefore, through this exercise, we are measuring the impact of a one-standard-deviation move in each variable on the *probability* that a bond trades. Further methodological details are provided in the appendix.

5 Results

Due to the different number of observations available in each database (see Table 1), we examine four sets of regressions:

Sample	**Independent Variables**	**Database Source**	**Inv.-Grade Bond-Month Observations**	**High-Yield Bond-Month Observations**
(1)	all bond and all stock variables	NAIC, FISD, CRSP, Lehman	67,261	16,633
(2)	all bond (except bond return) and all stock variables	NAIC, FISD, CRSP	121,964	43,000
(3)	all bond variables	NAIC, FISD, Lehman	186,416	49,465
(4)	all bond variables (except bond return)	NAIC, FISD	550,073	169,117

The dependent variable in each is monthly bond *volume* as defined in eq.(1).

Sample (1) includes the most variables but results in the least observations, since only bonds with information in all databases are included. The first and second regression samples

include stock variables, and therefore include only bonds with publicly traded equity. The bond return data from the *Lehman database* is excluded from sample (2) as this variable restricts considerably the available bond-month observations (the Lehman database has data only up to 1998). The third and fourth regression samples include bonds of both public and private companies; these regressions do not include stock variables but rather a dummy indicating whether the issuing firm has traded equity or not. This allows us to assess whether bonds of companies with publicly traded equity trade more than those with private equity. Regression sample (4) is the most comprehensive in that it includes all the bonds from the NAIC and FISD databases.

For each sample, regressions are run separately on the investment-grade and high-yield bond subsamples. Our goal is to understand whether the explanatory variables affecting trading in high-grade bonds have the same impact on the trading of high-yield bonds, and also control for the fact that the activity of insurance companies in these two segments of the market may be different.

All regressions are estimated with both the tobit and logit models. Our results, therefore, include 16 different regression models:

$$\overset{\textbf{2 models}}{\begin{pmatrix} tobit \\ logit \end{pmatrix}} \times \overset{\textbf{2 samples}}{\begin{pmatrix} investment\text{-}grade \\ high\text{-}yield \end{pmatrix}} \times \overset{\textbf{4 regressions}}{\begin{pmatrix} depending\ on \\ variables\ included \end{pmatrix}}$$

Tables 8 (for tobit) and 9 (for logit) summarize the results from all regressions. The tables report the total number of observations and the number of zero observations on trading volume in each sample. The proportion of zero observations allows us to assess the degree of censoring of the dependent variable in each subsample. The last two rows of the tables give the likelihood ratio test statistic against the intercept-only model as well as the corresponding p-value. All models are significant at the $> 99\%$ level.

Tables 10 and 11 present the impact of a one-standard-deviation move in each explanatory variable on the expected trading volume and probability of trade, respectively. The last row in both tables presents the 'base-case' expected value of the dependent variable given the mean value of all explanatory variables. We can summarize the results as follows:

- *Size of issue (amount outstanding):* As expected, issue size has a significant positive impact on trading volume. This is true for both models and all regressions. This variable is not only highly significant, but the size coefficients are larger than for any other variable, as shown in Tables 8 and 9. Further, Tables 10 and 11 reveal that the marginal impact of a one-standard-deviation move in *size* is much larger than

that of the other variables. For investment-grade bonds of companies with publicly traded equity (regression (1)), a one-standard-deviation change in issue size increases the probability that a bond trades by 19.8% (from 35.7% to 55.5%, Table 11) and increases the expected trading volume from 1.78 % to 2.35% of amount outstanding (Table 10). In general, size has a larger effect for investment-grade bonds than for high-yield bonds.

Particularly for the tobit estimates, we notice that the coefficients are larger in the combined samples of bonds of companies with publicly and privately traded equity (regressions (5) to (8)) than they are in the samples of bonds with publicly traded equity(regressions (1) to (4)). To test directly whether the trading of bonds with privately held equity is more sensitive to issue size, we examine an alternative regression specification, interacting the size variable with the traded equity dummy (Tables 22-25). The coefficients showing the incremental effect of the size variable on bonds with publicly traded equity changes signs and the economic impact is insignificant showing that bonds of companies with public equity are not affected differently by issue size than those with private equity.

- *Age of bond (years since issuance):* All bonds trade progressively less as they age, consistent with the idea that they are absorbed into inactive portfolios. In line with AEF, we find that *age* is very significant in explaining trading in corporate bonds. Tables 8 and 9 show that, in all regressions, the *age* coefficients are highly significant and negative. A one-standard-deviation change in the bond's age decreases the probability of trade from 35.7% to 29.8% in the investment-grade bond sample of companies with public equity (regression (1), Table 11) and from 13.8% to 9.7% in the high-yield bond sample of firms with public and private equity (regression (8)). *Age* reduces the expected volume by as much as 0.46% (from 1.72% - Table 10, regression (8)) for the sample of high-yield bonds, while the effect in the investment-grade sample of bonds with publicly traded equity is 0.408% (from 1.78% - Table 10, regression (1)). In terms of economic impact, age is the second most significant variable in explaining bond trading volume after issue size.

  To assess whether age affects public company bonds differently than private company ones, we interact the age variable with the traded equity dummy and find that the impact of age is stronger for public company bonds (Tables 22-23). The incremental economic impact of age on the trading of bonds of companies with publicly traded equity is strong in all samples, but is larger for the investment-grade samples (Tables

24-25).

- *Bond returns (absolute value of bond returns):* Return shocks have a significant negative impact on bond trading in all regressions and samples considered (except in regression (2), Table 9, where the coefficient is negative, but insignificant). The economic impact is about ten times stronger for investment-grade bonds (Table 10). Table 11 confirms that bond returns have a larger impact on the trading probability of investment-grade bonds (-1.9%) than that of high-yield bonds (-0.3%). Harris and Raviv (1993), however, theorize that the opposite effect should hold as they argue bond return volatility induces more speculative trading and the effect should be stronger for high-yield bonds. Our results also contrast with AEF who find that return volatility increases trading in their 55 FIPS-traded high-yield bonds.

  To verify the effect of *positive* bond returns on trading, we run additional regressions with 'bond returns' rather than their absolute value, but do not find convincing results that positive news increase trading (Tables 26-29). For the investment-grade samples, contemporaneous returns decrease bond trading, while the results for the high-yield samples are insignificant. The economic impact of bond returns on trading is very small.

- *Interest-rate shocks (absolute return of 10-year Treasuries):* We interact the absolute treasury return variable with a dummy indicating bonds with more than 6 years to expiration to study whether longer maturity bonds react differently to 10-year treasury returns. On average, large treasury returns have a negative contemporaneous effect on bond trading. All logit coefficients and all but two investment-grade samples tobit coefficients are negative. The coefficients are positive in samples (1) and (5), when bond return is included in the regressors (Table 8).

  Both Tables 8 and 9, however, show that the incremental impact on long-duration bonds is positive and significant. Since all coefficients on the interacted variable are larger in absolute value than the coefficients on absolute treasury returns, the net effect of treasury returns on long-maturity bond trading is positive. The economic impact of the interacted variable is also large. For example, for the investment-grade public company bonds (Table 11, regression (1)), a one-standard-deviation increase in treasury return decreases the trading probability of all bonds by 0.6%, but increases the trading probability of long-duration bonds by 2.9%. Overall, therefore, longer-maturity treasury returns decrease trading in short-maturity bonds (except for investment-grade bonds restricted by the Lehman subsample), but increase trading in long-maturity

bonds. For the 55 high-yield bonds traded on FIPS, AEF find that interest-rate shocks increase bond trading. Their results are consistent with ours, because the average time-to-maturity in their sample is 7.3 years, and, therefore, fall mostly in the long-duration category.

- *Equity market return shocks (abs(S&P500 return)):* Equity market shocks significantly decrease bond trading. All coefficients in Tables 8 and 9 are significant and of similar magnitude for both investment-grade and high-yield bonds. A one-standard-deviation shock in equity markets reduces the bond's probability to trade by 3.1% (from 35.7% in regression (1), Table 11) and reduces the expected trading volume by 0.19% (from 1.78% in regression (1), Table 10). This result is consistent with Chordia, Roll, and Subrahmanyam (2000) and Engle and Lange (1997) who find that stock market volatility and equity trading are negatively correlated.

- *Traded equity dummy (1 if the issuer has publicly traded equity reported on CRSP):* Consistent with our expectations, we find that bonds of companies with publicly traded stock trade more than those with privately held equity. All coefficients are significant for both the investment-grade and high-yield bond samples. The economic impact is small but always positive. The probability of trade is higher by 0.9% and 1.8% (in regressions (8) and (7), respectively, Table 11) for firms with public equity than it is for those with private equity. These results contrast with those of AEF, who find that bonds with privately held equity trade more than those with publicly traded equity for the 55 bonds traded on FIPS. AEF's results are, however, based on only 5 bonds of firms with private equity and are, therefore, more sample specific.

- *Trading activity and shocks in the firm's equity*: Movements in the firm's own equity do not seem to have a strong impact on bond trading . For investment-grade bonds, the tobit results show a significant positive impact of stock price movements on bond trading, but the logit results are sensitive to the sample. We expected to see a stronger impact of stock returns on high-yield bond trading as high-yield debt behaves more like the firm's equity and can be viewed as a hybrid security between risk-free debt and equity (Merton, 1973). However, we find that all coefficients in the high-yield samples are insignificant. Moreover, Tables 10 and 11 show that the economic impact of movements in the firm's equity on bond trading is very small.

  Tables 34-37 show that the results are similar when the squared stock returns are used instead of their absolute value. We also run the regressions with the actual stock return data, rather than their absolute value (Tables 38-41). The results show a significant

positive correlation between stock returns and bond trading, but the economic impact of changes in stock returns on bond trading is extremely small.

Contemporaneous equity trading volume, however, is significantly positively related to bond trading for all bonds and regressions (Tables 8 and 9). This is consistent findings by Hotchkiss and Ronen (1999) that both bonds and stocks react to firm-specific information. The economic impact of changes in stock trading is not large (between 1.2% and 1.6% in logit), but consistently positive in all samples (Tables 10 and 11). The size of the coefficients and the economic impact is almost the same for investment-grade and high-yield bonds, despite our expectations that the correlation would be stronger in the high-yield samples.

We include up to three lags of both stock trading volume and returns to control for possible autocorrelation in those variables. In the high-yield samples, we find some negative impact of stock return shocks at the second and third lag, and their economic impact on trading probability is -1.3% and -1.4% (Table 11, regression (2)), at the respective lag. All remaining coefficients of stock trading and returns are not significant and switch signs, and the economic impact is very small.

- *Credit risk (S&P rating):* Tables 8 and 9 show that all coefficients in the high-yield bond regressions are negative, indicating that higher credit risk[14] reduces both the expected trading volume and trading probability of high-yield bonds. Trading by insurance companies in the lowest credit rating segment is limited. The economic impact is also large as a one-standard-deviation increase in credit risk reduces the trading probability of high-yield bonds from 13.8% to 7.8% (regression (8), Table 11).

  On the other hand, Tables 8 and 10 illustrate that, except for one sample of firms with publicly traded equity (sample (3)), higher credit risk increases the expected trading volume of investment-grade bonds. Table 10, regression (5), shows that expected trading increases from 1.64% to 1.945% given a one-standard-deviation increase in credit risk. However, the effect on the probability of a bond to trade is less clear (Tables 9 and 11). While in the samples of companies with public equity, lower-rated investment-grade bonds have a smaller chance of trading than higher-rated investment-grade bonds, when investment-grade bonds of both companies with public and private equity are considered, the effect is reversed. The economic impact of credit risk changes (Table 11) is, however, small relative to the effect of variables such as age and size of the issue. The evidence suggests that high-yield and investment-grade, as well as bonds

[14] A lower S&P rating corresponds to a high point index in FISD and higher credit risk.

of companies with public and private equity, are affected differently by credit risk.

- *Interest-rate risk* (*time-to-maturity):* Interest-rate risk has a different impact on investment-grade and high-yield bonds. When time-to-maturity (TTM) is used to proxy for duration, an investment-grade bond's probability of trade is negatively affected by duration (Table 9) and the economic impact is relatively large (Table 11). For example, a public company investment-grade bond's trading probability falls from 35.7% to 32.6% when TTM increases by one standard deviation (Table 11, regression (1)). The tobit regression results (Table 8), however, are not as convincing as two of the coefficients are insignificant and positive when the bond return is included in the regression (samples (1) and (5)). The economic impact of changes in TTM is, however, smaller in those samples (Table 10). The effect of TTM on high-yield bond trading is unclear. The coefficients are either extremely small or insignificant and switch signs. The economic impact on the trading probability is also smaller (Table11).

  To further study the duration effect, we interact a 'callable bond' dummy with TTM to control for the fact that callability shortens duration. Tables 8 and 10 show that for callable bonds, longer time-to-maturity decreases trading in investment-grade and increases trading in high-yield bonds. The coefficients are all significant and the economic impact is large, especially when the bond return variable is part of the explanatory variables. Tables 9 and 11 also show that for callable bonds, TTM increases the trading probability of high-yield bonds and decreases the trading probability of investment-grade bonds (except for investment-grade sample (2), where the coefficient is positive and insignificant and the economic impact is smaller).

- *Callable bond dummy (1 if the issue is callable):* Embedded call options reduce bond trading in all but two samples of investment-grade bonds where the bond return variable is among the regressors (Tables 8 and 9, regressions (1) and (5)). Call options modify a bond's risk characteristics by reducing its duration, which may be causing the fall in trading volume.

- *Autocorrelation in liquidity (Lagged Bond Volume):* As expected, we find significant positive autocorrelation in trading activity. Both the tobit and logit coefficients are highly significant in all samples of investment-grade and high-yield bonds (Tables 8 and 9). Tables 10 and 11, however, show that the economic impact of a standard-deviation move in last month's volume does not change much the expected trading volume or probability of trading this month. The economic impact is small relative to variables like *size* and *age*. A one-standard-deviation move in last month's activity increases

this month's probability to trade by less than 1% in all samples (Table 11) and the expected impact on trading volume is always less than 0.1% of amount outstanding (Table 10).

- *Industry of the issuer ('financial', 'industrial', or 'utilities', as categorized by FISD):* The industry of the issuer does not have a strong effect on bond trading. High-yield bonds of industrial and financial firms do trade less (Tables 8 and 9) than bonds of utility firms, but the economic impact of changes in the industry of the issuer on bond trading is small (Tables 10 and 11). Investment-grade bonds of financial and industrial firms, however, trade more, with the exception of sample (7) in Tables 8 and 9. The results for investment-grade bonds is consistent with Table 6, which shows that insurance companies trade relatively more investment-grade bonds in the financial and industrial sector. The findings that insurance companies are less likely to trade high-yield bonds of industrial firms is, however, surprising, because Table 6 reveals that 66% of high-yield bond trades by insurance companies have been in bonds of industrial firms. Our regressions show that after controlling for other issuer- and issue-specific features (the remaining explanatory variables), insurance companies are more likely to pick high-yield bonds from the utility sector. However, the impact of the industry is small and does not affect strongly insurance companies' decision to trade a particular bond.

6 Conclusion

The current paper attempts to provide representative results on determinants of corporate bond trading and liquidity. The results are based on a dataset of insurance company trades from January 1995 to December 1999. Our analysis involves more than 17,000 high-yield and investment-grade bonds of 4,151 US private and public companies. Trading in the corporate bond market has not been studied so far on such a large scale.

Our analysis shows that about 80% of bonds do not trade in a month, and when they do trade, only about 5% of par value outstanding is traded. The size of an average buy or sell transaction by insurance companies is still, however, about $2.8 million of par value outstanding.

Using limited dependent variable regressions to account for the irregularly spaced data, we find that insurance companies trade mostly larger and newer investment-grade bonds of public firms. Interest-rate shocks increase trading in long-maturity bonds, while shocks in the

equity markets reduce corporate bond trading. It is important to distinguish between high-grade and high-yield bonds, as the two classes of bonds have opposite responses to interest-rate and credit-risk. Trading in high-yield (investment-grade) bonds decreases (increases) in the credit risk and duration of the issue. The industry of the issuer and embedded options as well as shocks in the firm's equity do not consistently affect bond trading beyond that explained by the remaining variables.

The newly available insurance company trading data allows us to quantify relationships between trading and bond characteristics that are representative of corporate bond trading practices. Understanding liquidity in corporate bond markets is important to both asset managers and policy makers. For passive funds, especially those mimicking indexes of illiquid bonds, analysis of liquidity is essential for establishing a balance between tracking accuracy and trading costs[15]. Active portfolio strategies involve substantially more trading and demand liquidity for immediacy in executing informationally motivated trades. Finally, policy makers are interested in liquidity to study market efficiency of current trading systems and design new market trading mechanisms.

[15]Sinquefield (1991) shows that passive funds can experience significant performance shortfalls unless they implement indexing techniques, aimed at optimizing tracking error and trading costs.

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Appendix

The tobit and logit models

Estimation and coefficient interpretation

A. Tobit

The tobit model is formulated as:

$$\begin{aligned} y_{it}^* &= \beta \mathbf{X}_{it} + \varepsilon_{it} && \varepsilon_{it} \sim N(0, \sigma^2) \\ y_{it} &= y_{it}^* && \text{if } y_{it}^* > 0 \\ y_{it} &= 0 && \text{if } y_{it}^* \leq 0 \end{aligned} \tag{A1}$$

The parameters of the tobit model are estimated using maximum likelihood (MLE). The MLE procedure produces consistent, efficient, and asymptotically normal estimates given some distributional assumption on the data. Given the large number of observations, we can assume normality of the error terms and the likelihood function for the tobit model can be written as:

$$L(\beta|\mathbf{X}_{it}) = \prod_{y_{it}=0} \Phi\left(-\frac{\mathbf{X}_{it}\beta}{\sigma}\right) \prod_{y_{it}>0} \phi\left(\frac{y_{it} - \mathbf{X}_{it}\beta}{\sigma}\right) \tag{A2}$$

where Φ is the cumulative density function and ϕ is the probability density function of the standard normal distribution.

The estimated Tobit coefficients do not have the same interpretation as in the usual OLS regression. The coefficients represent sensitivities of the latent variable, *desired trading* to the bond characteristics, i.e.

$$E(y_{it}^*) = \beta \mathbf{X}_{it} \text{ and } \frac{\partial E(y_{it}^*)}{\partial x_{jt}} = \beta_j. \tag{A3}$$

The sensitivities of the response variable, *actual trading*, can also be obtained, but they depend on the level of the variables at the particular observation as well as on the estimated coefficients:

$$\begin{aligned} E(y_{it}) &= P(y_{it} > 0)E(y_{it}|y_{it} > 0) + P(y_{it} = 0)E(y_{it}|y_{it} = 0) && \text{(A4)} \\ &= \Phi_i \left(\beta \mathbf{X}_{it} + \sigma \frac{\phi_i}{\Phi_i}\right) + (1 - \Phi_i)\, 0 && \text{(A5)} \\ &= \Phi_i \beta \mathbf{X}_{it} + \sigma \phi_i && \text{(A6)} \end{aligned}$$

where $\Phi_i = \Phi(z) = \Phi\left(\frac{\mathbf{X}_{it}\beta}{\sigma}\right)$ and therefore

$$\frac{\partial E(y)}{\partial x_j} = \Phi_i \beta_j \tag{A7}$$

Note that the explanatory variables have a constant effect on the *desired* trading (eq.(A3)), i.e. they do not depend on the particular observation. The effect of a change in an explanatory variable on the observable *actual* trading depends on the particular observation as well as on the remaining explanatory variables (eq.(A7)). The same change in the S&P rating, for example, has a different impact on the actual trading of a newly issued bond than it has on an older one. However, since Φ_i is positive, the *direction* of the impact is the same for all bonds. Therefore, the tobit coefficients serve our purpose well as they give us an indication of the *sign* of the effect of the explanatory variables on bond trading and liquidity.

Given the large number of observations in our study, the standard errors and p-values might not be a good representation of the economic significance of each factor. To assess the latter, we estimate the marginal change in expected trading volume due to one-standard-deviation change in each factor. This exercise involves calculating the expected trading volume, $E(y)$ (not $E(y^*)$, *the desire of trade*) at the average X values, i.e.:

$$E(y_{it}|\overline{\mathbf{X}}_{it}) \ = \overline{\Phi}_i \beta \overline{\mathbf{X}}_{it} + \sigma \overline{\phi}_i \tag{A8}$$

where $\overline{\Phi}_i = \overline{\Phi}(z) = \overline{\Phi}\left(\frac{\overline{\mathbf{X}}_{it}\beta}{\sigma}\right)$ =Standard Normal CDF of $\left(\frac{\overline{\mathbf{X}}_{it}\beta}{\sigma}\right)$

and $\overline{\phi}_i = \overline{\phi}_i\left(\frac{\overline{\mathbf{X}}_{it}\beta}{\sigma}\right)$ =Standard Normal PDF of $\left(\frac{\overline{\mathbf{X}}_{it}\beta}{\sigma}\right)$.

We then move each $\mathbf{X}_{ijt}$ element of $\mathbf{X}_{it}$ individually by one-standard-deviation and estimate:

$$E(y_{it}|\overline{\mathbf{X}}_{it} + \sigma(\mathbf{X}_{ijt})) \ = \Phi'_i \beta \left(\overline{\mathbf{X}}_{it} + \sigma(\mathbf{X}_{ijt})\right) + \sigma \phi'_i \tag{A9}$$

where $\Phi'_i = \Phi'(z) = \Phi'\left(\frac{\left(\overline{\mathbf{X}}_{it}+\sigma(\mathbf{X}_{ijt})\right)\beta}{\sigma}\right)$ =Standard Normal CDF of $\left(\frac{\left(\overline{\mathbf{X}}_{it}+\sigma(\mathbf{X}_{ijt})\right)\beta}{\sigma}\right)$

and $\phi'_i = \phi'_i\left(\frac{\left(\overline{\mathbf{X}}_{it}+\sigma(\mathbf{X}_{ijt})\right)\beta}{\sigma}\right)$ = Standard Normal PDF of $\left(\frac{\left(\overline{\mathbf{X}}_{it}+\sigma(\mathbf{X}_{ijt})\right)\beta}{\sigma}\right)$.

From eq.(A8) and eq.(A9) we can compute the change in $E(y)$ for one-standard-deviation change in each factor. The change in $E(y)$ is then compared across each X_{ijt} to assess the relative economic significance of each individual factor, keeping the remaining factors constant. Results from this exercise are presented in Table 10.

A panel tobit can be used to introduce firm-specific trading, which is independent of the explanatory variables. The panel tobit is formulated as:

$$\begin{aligned} y_{it}^* &= \alpha_i + \beta \mathbf{X}_{it} + \varepsilon_{it} && \varepsilon_{it} \sim N(0, \sigma^2) \\ y_{it} &= y_{it}^* && \text{if } y_{it}^* > 0 \\ y_{it} &= 0 && \text{if } y_{it}^* \leq 0 \end{aligned} \tag{A10}$$

The difference between the above model and model (A1) is that each company is allowed to have its own intercept, implying that the bonds of some companies may trade more than those of others even when the explanatory variables are the same. It also implies that there are some omitted firm-specific constant factors which make some bonds more active than others.

The LRT test is used to assess whether firm specific-coefficients improve our the parameter estimation. The LRT test is based on the optimized likelihood values:

$$2(L_u - L_r) \sim \chi_q^2 \tag{A11}$$

where L_u and L_r are the unrestricted (model (A10)) and restricted (model (A1)) likelihoods respectively. The test statistic is distributed with a χ^2 distribution with degrees of freedom q equal to the number of restrictions (here, q = the number of firms in the sample). The LRT test allows us to assess the significance of any omitted factors from our model.

B. Logit

The logit model is designed to estimate the effect of the explanatory variables on the trading *probability* of a corporate bond. It provides unbiased estimates when the dependent variable is severely truncated as in the case of corporate bond trading. Volume of trade, y, is discretized into a binary response which takes the value of 1 if the bond trades and 0 otherwise. Although information is lost when discretizing a continuous variable, the logit model produces consistent estimates of the coefficients of the explanatory variables. The model is summarized in the following:

$$\begin{aligned} y_{it}^* &= \beta \mathbf{X}_{it} + \varepsilon_{it} && \varepsilon_{it} \sim N(0, \sigma^2) && \\ y_{it} &= 1 && \text{if } y_{it}^* > 0 && \text{(the bond trades)} \\ y_{it} &= 0 && \text{if } y_{it}^* \leq 0 && \text{(the bond doesn't trade)} \end{aligned} \tag{B12}$$

The logit model estimates the *probability* of the bond to trade by using the latent variable framework of the tobit model discussed in the previous section. The logistic (assumed by logit) and the normal distributions are very similar, the logistic having slightly fatter tails than the normal. The logistic distribution is often used for computational efficiency as the cumulative distribution has a closed form, unlike the normal distribution.

The parameters of the logit model are estimated using maximum likelihood. Since,

$$\begin{aligned} P(y_{it}=1) &= P(y_{it}^{*}>0) = P(\beta\mathbf{X}_{it}+\varepsilon_{it}>0) = P(\varepsilon_{it}>-\beta\mathbf{X}_{it}) && \text{(B13)} \\ &= 1-F(-\beta\mathbf{X}_{it}) = F(\beta\mathbf{X}_{it}) = \frac{e^{\beta\mathbf{X}_{it}}}{1+e^{\beta\mathbf{X}_{it}}} && \text{(B14)} \\ P(y_{it}=0) &= 1-P(y_{it}=1) = \frac{1}{1+e^{\beta\mathbf{X}_{it}}} && \text{(B15)} \end{aligned}$$

the likelihood function of the logit model is:

$$\begin{aligned} L &= \prod_{y_{it}=1}\left(\frac{e^{\beta\mathbf{X}_{it}}}{1+e^{\beta\mathbf{X}_{it}}}\right)\prod_{y_{it}=0}\left(\frac{1}{1+e^{\beta\mathbf{X}_{it}}}\right) && \text{(B16)} \\ &= \prod_{i=1}^{n}\left(\frac{e^{\beta\mathbf{X}_{it}}}{1+e^{\beta\mathbf{X}_{it}}}\right)^{y_{it}}\left(\frac{1}{1+e^{\beta\mathbf{X}_{it}}}\right)^{1-y_{it}} && \text{(B17)} \end{aligned}$$

The coefficients of the logit model have a different interpretation than the ones from linear regression models, i.e.

$$E(y_{it}|\mathbf{X}_{it}) \neq \beta\mathbf{X}_{it}. \tag{B18}$$

Rather,

$$E(y_{it}^{*}|\mathbf{X}_{it}) = \beta\mathbf{X}_{it} \tag{B19}$$

and y_{it}^{*} is unobservable. Since, y can take the values of 0 and 1,

$$E(y_{it}|\mathbf{X}_{it}) = p = \frac{e^{\beta\mathbf{X}_{it}}}{1+e^{\beta\mathbf{X}_{it}}} \text{ from (eq.(B14))} \tag{B20}$$

and therefore:

$$\begin{aligned} \frac{\partial p}{\partial\mathbf{X}_{it}} &= \frac{\beta(1+e^{\beta\mathbf{X}_{it}})e^{\beta\mathbf{X}_{i}}-\beta e^{\beta\mathbf{X}_{i}}e^{\beta\mathbf{X}_{it}}}{(1+e^{\beta\mathbf{X}_{it}})^{2}} = \beta p(1-p) && \text{(B21)} \\ \frac{\partial p/p}{\partial\mathbf{X}_{it}} &= \beta(1-p) && \text{(B22)} \end{aligned}$$

The intuition behind eq.(B22) is that the logit coefficients, β, is proportional to the percentage probability change of a bond trading due to a change in the explanatory variables. As in the tobit model, the proportional change in the probability of trading triggered by a change in the factors is not constant. It depends on current bond's probability of not trading. Since the probability of not trading is positive, however, the explanatory variables have the same directional impact on each bond's probability of trading. This fits well the purpose of our study.

Table 1
Bond and Stock Variables
By Database Source

The first two variables in each database are used for matching purposes. Stock return and volume data are included up to three lags. Several bond issues may correspond to the same issuer and hence the same stock. The last row presents the number of matched bond-month or stock-month observations extracted from each database. Notation: **NAIC**: National Association of Insurance Commissioners, **FISD**: Fixed Investment Securities Database, **Lehman**: Lehman Database.

Database	**NAIC**	**FISD**	**Lehman**	**CRSP**
Variables	Bond Cusip Month Trading volume	Bond Cusip Month Amount outstanding S&P rating Industry code Callable Age Time to maturity	Bond Cusip Month Bond return	Stock Cusip Month Stock return Stock volume S&P500 Return 10yr Gvt Bonds
Bond-Month Observations	719,190	719,190	235,881	166,639

Table 2
Trading Frequency of Bonds and Stocks in the Sample

The table presents the frequency distribution of monthly par value traded as a percentage of par amount outstanding (the dependent variable in our model) for the complete NAIC/FISD sample and for the CRSP subsample of bonds of companies with publicly traded equity. The last column gives the corresponding trading frequencies for stocks in terms of monthly shares traded as a proportion of total shares outstanding. The figures in the table represent the number of bond-month (or stock-month) observations in each category as a proportion of the total number of bond-month (or stock-month) observations.

Sample	**Total NAIC/FISD Sample**		**CRSP Subsample**		
Bins	**Inv.-Grade**	**High-Yld**	**Inv.-Grade**	**High-Yld**	**Stocks**
No Trading	79.4%	84.1%	66.7%	79.1%	0.0%
(0-1]% of Par Value Traded	7.6%	7.0%	13.7%	10.4%	2.0%
(1-5]% of Par Value Traded	7.4%	5.7%	12.8%	7.6%	31.8%
(5-10]% of Par Value Traded	2.4%	1.5%	3.7%	1.7%	39.9%
(10-50]% of Par Value Traded	2.5%	1.4%	2.8%	1.1%	25.3%
50%+ of Par Value Traded	0.7%	0.3%	0.2%	0.0%	1.1%
Total	100%	100%	100%	100%	100%
Total Bond-Month Observations	550,073	169,117	122,750	43,889	166,639

Table 3
Trading Activity Across Months of the Year

Total monthly trading volume and number of trades across calender months after filtering trades labeled as 'various' and all bonds that are not US corporate debentures, medium term notes and zero coupon bonds. The volume data is in $ million of total par value traded each month, while the trades data is in actual number of transactions executed during that month. All numbers represent monthly averages for the five years in the sample - 1995 to 1999. The last row provides the average monthly volume and trades for the entire five-year sample period.

	Total Monthly Trading Volume			**Total Transactions per Month**	
Month	**Volume** ($ million)	**Buy Volume** ($ million)	**Sell Volume** ($ million)	**Buy Trades**	**Sell Trades**
January	16,884	9,090	7,794	3,117	2,914
February	15,552	7,747	7,805	2,740	2,734
March	18,473	8,533	9,940	3,182	3,501
April	15,405	7,841	7,564	2,709	2,784
May	16,212	8,013	8,199	2,714	3,149
June	19,289	9,693	9,596	3,122	3,281
July	15,413	8,312	7,100	2,879	2,655
August	14,038	7,314	6,724	2,640	2,232
September	16,651	8,505	8,146	2,934	2,661
October	17,194	9,923	7,272	3,549	2,519
November	18,320	10,068	8,253	3,405	2,834
December	21,358	11,415	9,943	4,036	3,716
Monthly Average	17,066	8,871	8,195	3,086	2,915

Table 4
Trading Activity Across Years in the Sample

The table presents for each year the total trading in US corporate bonds by insurance companies, the total number of bonds and total amount outstanding in each year's sample and the average age of these bonds. The growth in Total Amount Outstanding and Number of Bond Outstanding is calculated as the percentage increase from the previous year figures from the row above.

Descriptive Statistic	**1995**	**1996**	**1997**	**1998**	**1999**
Total Dollar Volume (in $ billions)	152.30	180.72	197.26	303.10	190.57
Total Dollar Buy Volume (in $ billions) (a)	93.57	102.40	106.54	162.85	66.90
Total Dollar Sell Volume (in $ billions) (b)	58.73	78.32	90.71	140.25	123.67
Proportion of Sell to Buy Volume ($= b/a$)	63%	76%	85%	86%	185%
Total Number of Buy Trades (c)	31,400	34,707	36,364	55,288	27,369
Total Number of Sell Trades (d)	23,191	29,777	31,662	49,116	41,159
Proportion of Sell to Buy Trades ($= d/c$)	74%	86%	87%	89%	150%
Total Amount Outstanding ($ trillion)	1.07	1.30	1.64	2.13	2.29
Growth in amount outstanding from previous year		22%	26%	30%	8%
Total Number of Bonds Outstanding	8,908	11,140	13,210	15,501	15,720
Growth in number of bonds from previous year		25%	19%	17%	1%
Average Age of Bonds Outstanding (in years)	4.28	4.05	3.98	3.95	4.51

Table 5
Age and Time-To-Maturity of Bonds in the Sample

Frequency distribution of age and time-to-maturity of the bonds in the sample. The *Age* variable represents years since issuance and *Time-to-Maturity* represents years to expiration of the bond. The table presents the number of bond-month observations in each *Age* and *Time-to-Maturity* category as well as the percentage of total bond-month observations in each bin.

	Age		**Time-To-Maturity**	
Bins	**Number of Observations**	**Percent of Total**	**Number of Observations**	**Percent of Total**
0-1 Years	125,761	17%	46,495	6%
1-2 Years	130,662	18%	57,302	8%
2-3 Years	114,118	16%	61,211	9%
3-4 Years	92,045	13%	60,926	8%
4-5 Years	71,966	10%	63,030	9%
5-6 Years	52,319	7%	52,459	7%
6-7 Years	40,327	6%	54,800	8%
7-8 Years	21,824	3%	49,116	7%
8-9 Years	14,669	2%	51,384	7%
9-10 Years	11,403	2%	47,514	7%
10-20 Years	21,671	3%	85,884	12%
20+ Years	22,425	3%	89,069	12%
Total Observations	719,190	100%	719,190	100%

Table 6
Industry Classification of Bonds in the Sample

Frequency distribution of investment-grade and high-yield bonds across industry groups as classified by the FISD database. The table gives the number of bond-month observations in each group and the corresponding percentage representation of that group within the investment-grade and high-yield samples.

Sample	**Investment-Grade**		**High-Yield**	
Industry Group	**Bond-Month Observations**	**Percent of Total**	**Bond-Month Observations**	**Percent of Total**
Industrial Sector	184,909	34%	110,873	66%
Financial Sector	231,894	42%	32,664	19%
Utilities Sector	133,270	24%	25,580	15%
Total Bond-Month Observations	550,073	100%	169,117	100%

Table 7
Descriptives Statistics of Variables in the Sample

Descriptive statistics of investment-grade and high-yield samples. All series are monthly and cover the period of January 1995 to December 1999. The S&P Rating is represented in points (rating below 10 is considered investment-grade, the lower the rating, the higher the credit quality of the bond). The averages are taken across all bond-month (or stock-month) observations of the investment-grade and high-yield samples of US corporate bonds.

	Investment-Grade Bonds					**High-Yield Bonds**				
Variables	Obs.	Mean	SD	Min	Max	Obs.	Mean	SD	Min	Max
Bond Volume (% of am. outst.)	550,073	1.64	11.59	-0.84	4600	169,117	0.94	9.84	0.00	1,746
Amount Outstanding ($ billions)	550,073	0.13	0.15	0.00	2.50	169,117	0.15	0.19	0.00	10.00
Bond Return (%)	186,416	0.87	1.57	-96.60	54.93	49,465	1.11	3.91	-96.56	257.14
Credit Rating	550,073	5.79	2.21	1.00	10.00	169,117	18.57	6.38	11.00	27.00
Age of Bond (years)	550,073	4.39	5.51	0.00	98.33	169,117	3.51	4.02	0.00	100.08
Time to Maturity (years)	550,073	9.44	10.25	0.00	100.08	169,117	7.19	4.93	0.00	54.75
Industrial Sector (Dummy)	550,073	0.34	0.47	0.00	1.00	169,117	0.66	0.48	0.00	1.00
Financial Sector (Dummy)	550,073	0.42	0.49	0.00	1.00	169,117	0.19	0.39	0.00	1.00
Callable (Dummy)	550,073	0.23	0.42	0.00	1.00	169,117	0.58	0.49	0.00	1.00
S&P500 Return (%)	550,073	2.00	4.21	-14.58	8.03	169117	2.02	4.21	-14.58	8.03
10yr Treasury Return (%)	550,073	0.53	1.86	-4.40	5.49	169,117	0.58	1.89	-4.40	5.49
Stock Return (%))	122,245	1.57	9.53	-82.93	103.57	43,408	1.37	16.67	-93.08	250.00
Stock Volume (% of shares outst.)	122,750	7.74	6.68	0.00	313.89	43,889	13.26	17.51	0.00	1,092
Traded Equity (Dummy)	550,073	0.22	0.42	0.00	1.00	169,117	0.26	0.44	0.00	1.00

TABLE 8

Results from Tobit Regressions

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val
Amount Outstanding	**8.557** 0.285 0.00	**5.489** 0.470 0.00	**7.407** 0.202 0.00	**3.829** 0.227 0.00	**10.212** 0.203 0.00	**16.399** 0.741 0.00	**40.387** 0.349 0.00	**13.206** 0.475 0.00
Age of Bond	**-0.356** 0.015 0.00	**-0.215** 0.023 0.00	**-0.397** 0.012 0.00	**-0.381** 0.017 0.00	**-0.189** 0.007 0.00	**-0.365** 0.032 0.00	**-0.207** 0.015 0.00	**-1.197** 0.036 0.00
Abs(Bond Return)	**-1.277** 0.056 0.00	**-0.078** 0.028 0.00			**-0.955** 0.036 0.00	**-0.135** 0.039 0.00		
AGVT=Abs(10yr Treasury Return)	**0.395** 0.060 0.00	**-0.047** 0.087 0.59	**-0.158** 0.041 0.00	**-0.145** 0.057 0.01	**0.234** 0.038 0.00	**-0.426** 0.153 0.01	**-0.207** 0.062 0.00	**-0.207** 0.123 0.09
AGVT × Dummy(TTM>6 yrs)	**0.914** 0.059 0.00	**0.238** 0.089 0.01	**0.322** 0.043 0.00	**0.360** 0.060 0.00	**0.836** 0.038 0.00	**0.927** 0.153 0.00	**1.148** 0.069 0.00	**1.254** 0.131 0.00
Abs(S&P500 Return)	**-0.195** 0.021 0.00	**-0.088** 0.035 0.01	**-0.132** 0.015 0.00	**-0.073** 0.019 0.00	**-0.172** 0.014 0.00	**-0.357** 0.059 0.00	**-0.472** 0.024 0.00	**-0.427** 0.043 0.00
Traded Equity (Dummy)					**0.379** 0.064 0.00	**1.457** 0.249 0.00	**5.766** 0.141 0.00	**2.940** 0.241 0.00
Abs(Stock Return)	**0.021** 0.009 0.02	**-0.003** 0.008 0.70	**0.011** 0.006 0.08	**-0.005** 0.004 0.22				
Abs(Stock Return (-1))	**0.004** 0.009 0.68	**0.003** 0.008 0.68	**-0.008** 0.006 0.15	**-0.002** 0.004 0.68				
Abs(Stock Return (-2))	**0.007** 0.009 0.43	**-0.030** 0.008 0.00	**0.019** 0.006 0.00	**-0.018** 0.004 0.00				
Abs(Stock Return (-3))	**-0.002** 0.009 0.83	**-0.025** 0.008 0.00	**0.002** 0.006 0.77	**-0.016** 0.004 0.00				
Stock Volume	**0.030** 0.011 0.01	**0.027** 0.008 0.00	**0.040** 0.008 0.00	**0.018** 0.004 0.00				
Stock Volume (-1)	**0.002** 0.012 0.87	**-0.010** 0.009 0.28	**-0.026** 0.009 0.00	**-0.010** 0.005 0.03				
Stock Volume (-2)	**0.007** 0.012 0.56	**-0.016** 0.010 0.10	**0.006** 0.009 0.51	**-0.002** 0.005 0.72				
Stock Volume (-3)	**0.006** 0.011 0.55	**0.005** 0.009 0.55	**-0.001** 0.008 0.89	**-0.006** 0.005 0.21				
Credit Risk (by S&P rating)	**0.126** 0.021 0.00	**-0.008** 0.013 0.53	**-0.003** 0.017 0.87	**-0.043** 0.009 0.00	**0.180** 0.013 0.00	**-0.104** 0.022 0.00	**0.259** 0.028 0.00	**-0.337** 0.021 0.00
Time-to-Maturity (TTM)	**0.004** 0.005 0.38	**-0.044** 0.019 0.02	**-0.029** 0.004 0.00	**-0.014** 0.016 0.40	**0.004** 0.003 0.29	**-0.002** 0.033 0.96	**-0.024** 0.007 0.00	**0.246** 0.031 0.00
TTM × Callable	**-0.134** 0.011 0.00	**0.128** 0.029 0.00	**-0.025** 0.009 0.00	**0.043** 0.021 0.04	**-0.110** 0.007 0.00	**0.157** 0.044 0.00	**-0.043** 0.015 0.00	**0.157** 0.043 0.00
Callable (Dummy)	**1.269** 0.250 0.00	**-2.864** 0.284 0.00	**-2.110** 0.173 0.00	**-1.822** 0.199 0.00	**0.615** 0.157 0.00	**-4.595** 0.466 0.00	**-6.832** 0.284 0.00	**-3.542** 0.431 0.00
Bond Volume (-1)	**0.186** 0.008 0.00	**0.141** 0.023 0.00	**0.175** 0.007 0.00	**0.200** 0.016 0.00	**0.184** 0.006 0.00	**0.185** 0.026 0.00	**0.092** 0.006 0.00	**0.086** 0.005 0.00
Industrial Sector (Dummy)	**0.413** 0.147 0.01	**-0.237** 0.261 0.36	**0.592** 0.125 0.00	**-0.236** 0.178 0.19	**0.300** 0.082 0.00	**-1.184** 0.357 0.00	**-1.091** 0.172 0.00	**-1.379** 0.331 0.00
Financial Sector (Dummy)	**0.634** 0.161 0.00	**-0.166** 0.354 0.64	**0.424** 0.137 0.00	**-0.673** 0.245 0.01	**0.575** 0.083 0.00	**-1.113** 0.495 0.02	**-1.081** 0.169 0.00	**-1.821** 0.398 0.00
Constant	**-5.856** 0.252 0.00	**-2.711** 0.458 0.00	**-5.426** 0.204 0.00	**-3.065** 0.309 0.00	**-7.625** 0.136 0.00	**-13.389** 0.657 0.00	**-33.048** 0.272 0.00	**-23.482** 0.631 0.00
Observations	**67,261**	**16,633**	**121,964**	**43,000**	**186,416**	**49,465**	**550,073**	**169,117**
Censored Observations	42,683	12,184	81,355	34,104	126,121	37,283	436,741	142,263
Likelihood Ratio Test=$2(L_u - L_r)$	**3,873**	**672**	**6,091**	**1,921**	**9,423**	**1,290**	**25,810**	**4,885**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 9

Results from Logit Regressions

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val
Amount Outstanding	**4.103** 0.075 0.00	**2.773** 0.133 0.00	**3.160** 0.047 0.00	**1.757** 0.069 0.00	**4.034** 0.046 0.00	**2.536** 0.072 0.00	**4.786** 0.027 0.00	**1.992** 0.041 0.00
Age of Bond	**-0.065** 0.003 0.00	**-0.060** 0.007 0.00	**-0.081** 0.002 0.00	**-0.131** 0.005 0.00	**-0.028** 0.001 0.00	**-0.046** 0.003 0.00	**-0.011** 0.001 0.00	**-0.112** 0.003 0.00
Abs(Bond Return)	**-0.062** 0.011 0.00	**-0.011** 0.007 0.14			**-0.055** 0.007 0.00	**-0.013** 0.004 0.00		
AGVT=Abs(10yr Treasury Return)	**-0.017** 0.012 0.16	**-0.016** 0.023 0.48	**-0.037** 0.007 0.00	**-0.036** 0.016 0.02	**-0.013** 0.007 0.06	**-0.053** 0.014 0.00	**-0.029** 0.004 0.00	**-0.022** 0.008 0.01
AGVT × Dummy(TTM>6 yrs)	**0.120** 0.012 0.00	**0.074** 0.024 0.00	**0.073** 0.008 0.00	**0.104** 0.016 0.00	**0.122** 0.007 0.00	**0.120** 0.014 0.00	**0.101** 0.004 0.00	**0.102** 0.009 0.00
Abs(S&P500 Return)	**-0.042** 0.004 0.00	**-0.037** 0.009 0.00	**-0.028** 0.003 0.00	**-0.027** 0.005 0.00	**-0.036** 0.003 0.00	**-0.043** 0.005 0.00	**-0.032** 0.001 0.00	**-0.033** 0.003 0.00
Traded Equity (Dummy)					**0.134** 0.012 0.00	**0.201** 0.023 0.00	**0.508** 0.008 0.00	**0.277** 0.015 0.00
Abs(Stock Return)	**0.002** 0.002 0.32	**-0.000** 0.002 0.83	**0.002** 0.001 0.07	**-0.002** 0.001 0.12				
Abs(Stock Return (-1))	**0.001** 0.002 0.49	**0.001** 0.002 0.59	**-0.000** 0.001 0.81	**-0.001** 0.001 0.47				
Abs(Stock Return (-2))	**0.003** 0.002 0.08	**-0.007** 0.002 0.00	**0.005** 0.001 0.00	**-0.005** 0.001 0.00				
Abs(Stock Return (-3))	**-0.000** 0.002 0.95	**-0.008** 0.002 0.00	**0.000** 0.001 0.70	**-0.005** 0.001 0.00				
Stock Volume	**0.007** 0.002 0.00	**0.007** 0.002 0.00	**0.007** 0.001 0.00	**0.006** 0.001 0.00				
Stock Volume (-1)	**-0.002** 0.002 0.44	**-0.002** 0.002 0.32	**-0.004** 0.002 0.02	**-0.003** 0.001 0.06				
Stock Volume (-2)	**0.002** 0.002 0.48	**-0.004** 0.003 0.16	**0.000** 0.002 0.84	**-0.001** 0.001 0.51				
Stock Volume (-3)	**0.001** 0.002 0.73	**0.001** 0.002 0.56	**0.000** 0.001 0.98	**-0.002** 0.001 0.17				
Credit Risk (by S&P rating)	**-0.004** 0.004 0.34	**-0.003** 0.003 0.38	**-0.033** 0.003 0.00	**-0.013** 0.003 0.00	**0.013** 0.002 0.00	**-0.012** 0.002 0.00	**0.008** 0.002 0.00	**-0.034** 0.001 0.00
Time-to-Maturity (TTM)	**-0.011** 0.001 0.00	**-0.008** 0.005 0.09	**-0.011** 0.001 0.00	**-0.000** 0.004 0.99	**-0.009** 0.001 0.00	**-0.005** 0.003 0.12	**-0.005** 0.000 0.00	**0.016** 0.002 0.00
TTM × Callable	**-0.018** 0.002 0.00	**0.028** 0.008 0.00	**0.002** 0.002 0.10	**0.001** 0.006 0.84	**-0.015** 0.001 0.00	**0.021** 0.004 0.00	**-0.002** 0.001 0.04	**0.010** 0.003 0.00
Callable (Dummy)	**0.105** 0.051 0.04	**-0.635** 0.074 0.00	**-0.538** 0.031 0.00	**-0.341** 0.054 0.00	**-0.015** 0.029 0.62	**-0.518** 0.042 0.00	**-0.482** 0.018 0.00	**-0.168** 0.028 0.00
Bond Volume (-1)	**0.033** 0.002 0.00	**0.049** 0.006 0.00	**0.032** 0.001 0.00	**0.064** 0.005 0.00	**0.034** 0.001 0.00	**0.013** 0.003 0.00	**0.006** 0.000 0.00	**0.006** 0.001 0.00
Industrial Sector (Dummy)	**0.105** 0.030 0.00	**-0.042** 0.068 0.54	**0.147** 0.023 0.00	**-0.024** 0.048 0.62	**0.025** 0.015 0.10	**-0.129** 0.032 0.00	**-0.133** 0.011 0.00	**-0.074** 0.022 0.00
Financial Sector (Dummy)	**0.279** 0.032 0.00	**0.051** 0.093 0.58	**0.212** 0.025 0.00	**-0.186** 0.067 0.01	**0.138** 0.015 0.00	**-0.133** 0.045 0.00	**-0.075** 0.010 0.00	**-0.160** 0.027 0.00
Constant	**-1.081** 0.051 0.00	**-0.770** 0.120 0.00	**-0.769** 0.037 0.00	**-0.698** 0.084 0.00	**-1.322** 0.025 0.00	**-0.834** 0.060 0.00	**-1.888** 0.017 0.00	**-1.084** 0.042 0.00
Observations	**67,261**	**16,633**	**121,964**	**43,000**	**186,416**	**49,465**	**550,073**	**169,117**
Censored Observations	42,683	12,184	81,355	34,104	12,6121	37,283	436,741	142,263
Likelihood Ratio Test=$2(L_u - L_r)$	**6,447**	**1,064**	**11,946**	**2,790**	**17,550**	**2,611**	**61,094**	**9,968**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 10

Relative Sensitivity of Trading Volume to Each Variable

Effect of one-standard-deviation change in each explanatory variable on the expected trading volume of a bond in each sample. The dependent variable, y =trading volume, is standardized to represent the percentage of par amount outstanding traded per month. All numbers in the table represent the change in expected trading volume due to a one standard deviation change in each explanatory variable. All numbers are multiplied by 100 to represent percentages. The last row in the table gives the expected trading volume given the average values of the explanatory variables, i.e. the "base-case expected value".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.571	0.247	0.453	0.129	0.552	0.606	0.920	0.253
Age of Bond	-0.408	-0.155	-0.435	-0.199	-0.263	-0.235	-0.142	-0.457
Abs(Bond Return)	-0.465	-0.030			-0.304	-0.044		
AGVT=Abs(10yr Treasury Return)	0.198	-0.017	-0.065	-0.037	0.103	-0.123	-0.049	-0.038
AGVT × Dummy(TTM>6 yrs)	0.304	0.060	0.086	0.065	0.226	0.190	0.143	0.138
Abs(S&P500 Return)	-0.191	-0.065	-0.135	-0.048	-0.150	-0.208	-0.279	-0.195
Traded Equity (Dummy)					0.038	0.093	0.212	0.096
Abs(Stock Return)	0.037	-0.007	0.020	-0.010				
Abs(Stock Return (-1))	0.007	0.007	-0.016	-0.003				
Abs(Stock Return (-2))	0.013	-0.063	0.035	-0.035				
Abs(Stock Return (-3))	-0.003	-0.053	0.003	-0.030				
Stock Volume	0.063	0.071	0.086	0.043				
Stock Volume (-1)	0.004	-0.025	-0.054	-0.023				
Stock Volume (-2)	0.014	-0.039	0.013	-0.004				
Stock Volume (-3)	0.013	0.013	-0.002	-0.013				
Credit Risk	0.251	-0.030	-0.005	-0.110	0.304	-0.297	0.249	-0.641
Time-to-Maturity (TTM)	0.015	-0.077	-0.096	-0.018	0.011	-0.003	-0.036	0.229
TTM × Callable	-0.129	0.170	-0.022	0.044	-0.126	0.172	-0.023	0.088
Callable (Dummy)	0.067	-0.378	-0.116	-0.205	0.044	-0.529	-0.241	-0.237
Bond Volume (-1)	0.078	0.023	0.060	0.019	0.062	0.025	0.022	0.010
Industrial Sector (Dummy)	0.076	-0.044	0.102	-0.034	0.030	-0.156	-0.058	-0.108
Financial Sector (Dummy)	0.057	-0.003	0.032	-0.009	0.050	-0.020	-0.072	-0.043
Base-Case Expected Value	**1.782**	**0.900**	**1.697**	**0.625**	**1.641**	**1.925**	**2.521**	**1.723**

TABLE 11

Relative Sensitivity of Probability of Trading to Each Variable

Effect of one-standard-deviation change in each explanatory variable on the probability of a bond to trade. The dependent variable: $y = 1$ if the bond trades and $y = 0$ otherwise. Therefore, $E[y] = Prob(Trade)$. The last row in the table gives the probability of trade given the average value of the explanatory variables, i.e. the "base-case trading probability".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.198	0.105	0.152	0.053	0.170	0.091	0.108	0.039
Age of Bond	-0.059	-0.036	-0.073	-0.060	-0.032	-0.029	-0.007	-0.041
Abs(Bond Return)	-0.019	-0.003			-0.015	-0.004		
AGVT=Abs(10yr Treasury Return)	-0.006	-0.005	-0.012	-0.008	-0.004	-0.015	-0.006	-0.004
AGVT × Dummy(TTM>6 yrs)	0.029	0.015	0.015	0.016	0.025	0.024	0.012	0.011
Abs(S&P500 Return)	-0.031	-0.022	-0.023	-0.015	-0.025	-0.025	-0.018	-0.014
Traded Equity (Dummy)					0.011	0.013	0.018	0.009
Abs(Stock Return)	0.002	-0.001	0.003	-0.003				
Abs(Stock Return (-1))	0.002	0.002	-0.000	-0.001				
Abs(Stock Return (-2))	0.004	-0.013	0.007	-0.008				
Abs(Stock Return (-3))	-0.000	-0.014	0.001	-0.008				
Stock Volume	0.012	0.016	0.013	0.012				
Stock Volume (-1)	-0.003	-0.005	-0.006	-0.005				
Stock Volume (-2)	0.003	-0.007	0.001	-0.002				
Stock Volume (-3)	0.001	0.003	0.000	-0.003				
Credit Risk	-0.006	-0.009	-0.043	-0.030	0.017	-0.035	0.007	-0.060
Time-to-Maturity (TTM)	-0.031	-0.012	-0.029	-0.000	-0.022	-0.007	-0.006	0.014
TTM × Callable	-0.013	0.030	0.002	0.001	-0.014	0.022	-0.001	0.006
Callable (Dummy)	0.004	-0.076	-0.024	-0.036	-0.001	-0.059	-0.016	-0.011
Bond Volume (-1)	0.010	0.007	0.009	0.005	0.009	0.002	0.001	0.001
Industrial Sector (Dummy)	0.014	-0.007	0.020	-0.003	0.002	-0.017	-0.007	-0.006
Financial Sector (Dummy)	0.019	0.001	0.013	-0.002	0.009	-0.002	-0.005	-0.004
Base-Case Trading Probability	**0.357**	**0.254**	**0.318**	**0.186**	**0.310**	**0.234**	**0.184**	**0.138**

Additional Tables

Table 12
Sample Correlation Matrix (Investment-Grade)

The table presents the correlations among the variables in the investment-grade sample of public company bonds (sample 1) with data in NAIC, FISD, Lehman, and CRSP - 67,261 observations in total. The sample covers the period from January 1995 to December 1999.

	Am.Out.	Age	BRet	GVT	S&P	SRet	SRet(-1)	SVol	SVol(-1)	Rating	TTM	Callable	BVol(-1)	Ind
Am.Out.	1.00	-0.14	0.02	-0.01	0.02	0.04	0.04	0.03	0.03	-0.12	0.05	-0.11	0.00	0.13
Age	-0.14	1.00	-0.12	0.00	0.00	-0.04	-0.04	-0.06	-0.06	-0.14	-0.17	0.35	-0.11	0.01
BRet	0.02	-0.12	1.00	0.65	0.11	0.06	-0.02	0.03	0.01	-0.01	0.29	0.02	0.02	0.04
GVT	-0.01	0.00	0.65	1.00	0.16	0.06	0.00	0.00	-0.04	-0.01	-0.01	0.02	-0.02	-0.01
S&P	0.02	0.00	0.11	0.16	1.00	0.19	0.04	0.03	0.00	0.00	0.01	-0.03	0.01	0.00
SRet	0.04	-0.04	0.06	0.06	0.19	1.00	0.07	0.28	0.12	0.05	-0.03	-0.07	0.00	0.02
SRet(-1)	0.04	-0.04	-0.02	0.00	0.04	0.07	1.00	0.19	0.28	0.05	-0.03	-0.07	0.02	0.01
SVol	0.03	-0.06	0.03	0.00	0.03	0.28	0.19	1.00	0.71	0.16	-0.02	-0.07	0.02	0.03
SVol(-1)	0.03	-0.06	0.01	-0.04	0.00	0.12	0.28	0.71	1.00	0.16	-0.02	-0.07	0.03	0.03
Rating	-0.12	-0.14	-0.01	-0.01	0.00	0.05	0.05	0.16	0.16	1.00	-0.06	-0.12	0.07	0.12
TTM	0.05	-0.17	0.29	-0.01	0.01	-0.03	-0.03	-0.02	-0.02	-0.06	1.00	0.25	0.04	0.15
Callable	-0.11	0.35	0.02	0.02	-0.03	-0.07	-0.07	-0.07	-0.07	-0.12	0.25	1.00	-0.05	0.01
BVol(-1)	0.00	-0.11	0.02	-0.02	0.01	0.00	0.02	0.02	0.03	0.07	0.04	-0.05	1.00	0.02
Ind	0.13	0.01	0.04	-0.01	0.00	0.02	0.01	0.03	0.03	0.12	0.15	0.01	0.02	1.00
Fin	-0.10	-0.08	-0.06	0.01	0.00	0.04	0.05	0.01	0.01	-0.10	-0.21	-0.14	-0.01	-0.78

Table 13
Sample Correlation Matrix (High-Yield)

The table presents the correlations among the variables in the high-yield sample of public company bonds (sample 2) with data in NAIC, FISD, Lehman, and CRSP - 16,633 observations in total. The sample covers the period from January 1995 to December 1999.

	Am.Out.	Age	BRet	GVT	S&P	SRet	SRet(-1)	SVol	SVol(-1)	Rating	TTM	Callable	BVol(-1)	Ind
Am.Out.	1.00	-0.23	0.07	-0.01	0.02	0.02	0.03	0.11	0.11	0.00	0.07	-0.08	0.00	0.08
Age	-0.23	1.00	-0.08	0.03	-0.03	-0.08	-0.08	-0.03	-0.03	-0.02	-0.12	0.03	-0.06	-0.19
BRet	0.07	-0.08	1.00	0.11	0.03	0.22	0.15	0.15	0.09	0.07	0.10	-0.03	-0.01	0.03
GVT	-0.01	0.03	0.11	1.00	0.15	-0.02	-0.02	-0.02	-0.05	0.09	0.03	-0.04	-0.02	-0.04
S¶	0.02	-0.03	0.03	0.15	1.00	0.08	0.05	0.02	0.01	-0.05	-0.03	0.06	0.00	0.00
SRet	0.02	-0.08	0.22	-0.02	0.08	1.00	0.17	0.30	0.07	0.00	-0.03	0.09	-0.02	0.08
SRet(-1)	0.03	-0.08	0.15	-0.02	0.05	0.17	1.00	0.20	0.30	-0.01	-0.03	0.09	-0.01	0.08
SVol	0.11	-0.03	0.15	-0.02	0.02	0.30	0.20	1.00	0.61	-0.03	0.06	0.02	-0.02	0.03
SVol(-1)	0.11	-0.03	0.09	-0.05	0.01	0.07	0.30	0.61	1.00	-0.04	0.06	0.02	0.00	0.02
Rating	0.00	-0.02	0.07	0.09	-0.05	0.00	-0.01	-0.03	-0.04	1.00	0.08	-0.11	0.02	-0.18
TTM	0.07	-0.12	0.10	0.03	-0.03	-0.03	-0.03	0.06	0.06	0.08	1.00	-0.08	0.02	0.03
Callable	-0.08	0.03	-0.03	-0.04	0.06	0.09	0.09	0.02	0.02	-0.11	-0.08	1.00	-0.09	0.09
BVol(-1)	0.00	-0.06	-0.01	-0.02	0.00	-0.02	-0.01	-0.02	0.00	0.02	0.02	-0.09	1.00	0.00
Ind	0.08	-0.19	0.03	-0.04	0.00	0.08	0.08	0.03	0.02	-0.18	0.03	0.09	0.00	1.00
Fin	-0.09	-0.03	-0.02	0.04	-0.02	-0.07	-0.07	-0.05	-0.05	0.20	-0.07	-0.18	0.01	-0.66

Table 14
Sample Correlation Matrix (Investment-Grade)

The table presents the correlations among the variables in the investment-grade sample of both public and private company bonds (sample 7) with data in both NAIC and FISD - 550,073 observations in total. The sample covers the period from January 1995 to December 1999.

	AO	Age	GVT	GVT×TTM	S&P	TE	Rat	TTM	TTM×C	Call	BV(-1)	Ind	Fin
Amount Outstanding	1.00	-0.04	-0.00	0.09	0.01	0.27	0.01	0.17	0.04	-0.02	-0.02	0.17	-0.09
Age	-0.04	1.00	-0.01	-0.05	-0.00	0.00	-0.09	-0.07	0.12	0.41	-0.04	-0.05	-0.22
GVT	-0.00	-0.01	1.00	0.55	0.26	0.01	0.01	0.00	0.01	0.00	-0.00	-0.00	-0.01
GVT×TTM	0.09	-0.05	0.55	1.00	0.14	0.09	0.01	0.41	0.25	0.17	0.00	0.07	-0.15
S&P	0.01	-0.00	0.26	0.14	1.00	-0.01	-0.00	0.00	-0.01	-0.01	-0.00	0.01	0.01
TE	0.27	0.00	0.01	0.09	-0.01	1.00	0.13	0.14	-0.01	-0.03	-0.01	0.31	-0.16
Rating	0.01	-0.09	0.01	0.01	-0.00	0.13	1.00	-0.00	-0.09	-0.10	0.02	0.28	-0.24
TTM	0.17	-0.07	0.00	0.41	0.00	0.14	-0.00	1.00	0.54	0.29	-0.00	0.10	-0.25
TTM×Call	0.04	0.12	0.01	0.25	-0.01	-0.01	-0.09	0.54	1.00	0.78	-0.02	-0.07	-0.17
Callable	-0.02	0.41	0.00	0.17	-0.01	-0.03	-0.10	0.29	0.78	1.00	-0.03	-0.09	-0.16
BVol(-1)	-0.02	-0.04	-0.00	0.00	-0.00	-0.01	0.02	-0.00	-0.02	-0.03	1.00	0.01	0.00
Ind	0.17	-0.05	-0.00	0.07	0.01	0.31	0.28	0.10	-0.07	-0.09	0.01	1.00	-0.61
Fin	-0.09	-0.22	-0.01	-0.15	0.01	-0.16	-0.24	-0.25	-0.17	-0.16	0.00	-0.61	1.00

Table 15
Sample Correlation Matrix (High-Yield)

The table presents the correlations among the variables in the high-yield sample of both public and private company bonds (sample 8) with data in both NAIC and FISD - 169,117 observations in total. The sample covers the period from January 1995 to December 1999.

	AO	Age	GVT	GVT×TTM	S&P	TE	Rat	TTM	TTM×C	Call	BV(-1)	Ind	Fin
Amount Outstanding	1.00	-0.15	-0.02	0.09	0.03	0.11	-0.28	0.11	0.15	0.17	-0.02	0.22	-0.20
Age	-0.15	1.00	-0.00	-0.15	-0.02	-0.00	0.04	-0.12	-0.06	0.04	-0.01	-0.11	-0.02
GVT	-0.02	-0.00	1.00	0.59	0.26	-0.00	0.06	0.02	-0.01	-0.04	-0.00	-0.04	0.03
GVT×TTM	0.09	-0.15	0.59	1.00	0.14	0.07	-0.08	0.41	0.29	0.14	-0.00	0.09	-0.12
S&P	0.03	-0.02	0.26	0.14	1.00	-0.00	-0.06	-0.03	0.02	0.04	-0.01	0.03	-0.01
TE	0.11	-0.00	-0.00	0.07	-0.00	1.00	-0.24	0.07	0.17	0.22	-0.02	0.23	-0.17
Rating	-0.28	0.04	0.06	-0.08	-0.06	-0.24	1.00	-0.04	-0.27	-0.43	0.03	-0.48	0.43
TTM	0.11	-0.12	0.02	0.41	-0.03	0.07	-0.04	1.00	0.54	0.12	0.01	-0.00	-0.12
TTM×Call	0.15	-0.06	-0.01	0.29	0.02	0.17	-0.27	0.54	1.00	0.75	-0.02	0.22	-0.27
Callable	0.17	0.04	-0.04	0.14	0.04	0.22	-0.43	0.12	0.75	1.00	-0.03	0.41	-0.37
BVol(-1)	-0.02	-0.01	-0.00	-0.00	-0.01	-0.02	0.03	0.01	-0.02	-0.03	1.00	-0.02	0.02
Ind	0.22	-0.11	-0.04	0.09	0.03	0.23	-0.48	-0.00	0.22	0.41	-0.02	1.00	-0.68
Fin	-0.20	-0.02	0.03	-0.12	-0.01	-0.17	0.43	-0.12	-0.27	-0.37	0.02	-0.68	1.00

Table 16
Trading Frequency of Bonds
Appearing in both the NAIC and Lehman Databases

Frequency distribution of monthly bond trading volume as percentage of amount outstanding (the dependent variable in our model). The figures in the table represent the bond-month observations as a proportion of the total number of observations in the matched NAIC-Lehman sample.

Trading Frequency	**Investment-Grade Bonds**	**High-Yield Bonds**
No Trading	0.677	0.754
(0-1]% of Par Value Traded	0.128	0.116
(1-5]% of Par Value Traded	0.126	0.093
(5-10]% of Par Value Traded	0.038	0.022
(10-50]% of Par Value Traded	0.029	0.015
50%+ of Par Value Traded	0.002	0.001
Total Observations	186,416	49,465

Table 17
Trading Activity Across Months of the Year
In the Sample Matched to the Lehman Database

Total monthly trading volume and number of trades across calender months. Only bonds appearing in both the NAIC and Lehman databases are considered. The volume data is in $billions of par value traded and while the trades data is in actual number of transactions executed during that month.

Variables	**$ Volume**	**$ Buy Volume**	**$ Sell Volume**	**# Buy Trades**	**# Sell Trades**
January	11,111	6,116	4,996	2,117	1,828
February	9,703	4,858	4,845	1,761	1,634
March	11,560	5,672	5,888	2,125	2,066
April	9,751	5,154	4,597	1,794	1,666
May	10,107	5,031	5,075	1,762	1,936
June	7,881	4,237	3,644	1,313	1,227
July	6,505	3,570	2,935	1,254	1,117
August	6,270	3,789	2,481	1,346	851
September	7,070	3,963	3,107	1,343	1,022
October	7,333	4,345	2,988	1,563	1,018
November	6,629	4,181	2,447	1,444	933
December	9,595	5,627	3,968	1,982	1,477

Table 18
Trading Activity Across Years
In the Sample Matched to the Lehman Database

Average trading activity and amount outstanding across years in the sample. Only bonds appearing in both the NAIC and Lehman databases are considered. The Lehman database has no data for 1999. All numbers are monthly averages across all months of the year and all bonds in the sample.

Variables	**1995**	**1996**	**1997**	**1998**	**1999**
Dollar Trading Volume ($ millions)	1.98	2.20	2.04	2.90	NA
Dollar Buy Volume ($ millions)	1.16	1.22	1.06	1.53	NA
Dollar Sell Volume ($ millions)	0.82	0.98	0.98	1.37	NA
Number of Buy Trades	0.41	0.43	0.38	0.52	NA
Number of Sell Trades	0.32	0.35	0.33	0.48	NA
Trading Volume per Amount Outstanding (%)	1.24	1.23	1.10	1.46	NA
Amount Outstanding ($ billions)	0.17	0.18	0.19	0.19	NA

Table 19
Age and Time-To-Maturity of Bonds
Appearing in both the NAIC and Lehman Databases

Frequency distribution of age and time-to-maturity of the bonds appearing in both the NAIC and Lehman databases. The *Age* variable represents years since issuance and *Time-to-Maturity* represents years to expiration of the bond. The table presents both the number of observations in each *Age* and *Time-to-Maturity* category as well as the percentage of total observations in each bin.

Age/Time-To-Maturity Group	**Age Observations**	**Percent of Total**	**Time-to-Maturity Observations**	**Percent of Total**
(0,1] Years	37,684	0.16	11,781	0.05
(1,2] Years	35,098	0.15	14,188	0.06
(2,3] Years	38,259	0.16	15,924	0.07
(3,4] Years	37,359	0.16	16,506	0.07
(4,5] Years	34,317	0.15	19,231	0.08
(5,6] Years	19,965	0.08	20,021	0.08
(6,7] Years	11,462	0.05	21,914	0.09
(7,8] Years	6,526	0.03	20,066	0.09
(8,9] Years	5,797	0.02	19,071	0.08
(9,10] Years	5,020	0.02	19,694	0.08
(10,20] Years	6,861	0.03	27,429	0.12
20+ Years	13,752	0.06	42,9360	0.18

Table 20
Industry Classification of Bonds
Appearing both in the NAIC and Lehman Databases

Frequency distribution of investment-grade and high-yield bonds across industry groups. Only bonds appearing in both datases are considered. The table gives the number of bond-month observations in each group and the corresponding percentage representation of that group within the investment-grade and high-yield samples.

Industy Group	**Investment-Grade Bonds**	**Percent of Total**	**High-Yield Bonds**	**Percent of Total**
Industrial	68,533	0.37	36,815	0.74
Financial	59,133	0.32	4,941	0.10
Utilities	58,750	0.32	7,709	0.16

Table 21
Descriptive Statistics of the Characteristics of Bonds Appearing in both the NAIC and Lehman Databases

Descriptive statistics of investment-grade and high-yield samples. All series are monthly and cover the period of January 1995 to December 1999. The S&P Rating is represented in points (rating below 10 is considered investment-grade, the lower the rating, the higher the credit quality of the bond).

	Investment-Grade Bonds					**High-Yield Bonds**				
Variables	Obs.	Mean	SD	Min	Max	Obs.	Mean	SD	Min	Max
Bond Volume (% of am. outst.)	186,416	1.34	4.80	0.00	195.15	49,465	0.79	8.79	0.00	1746.03
Amount Outstanding ($ billions)	186,416	0.18	0.14	0.00	2.25	49,465	0.18	0.15	0.00	2.00
Bond Return (%)	186,416	0.87	1.57	-96.60	54.93	49,465	1.11	3.91	-96.56	257.14
Credit Rating	186,416	5.84	2.34	1.00	10.00	49,465	16.60	5.67	11.00	27.00
Age of Bond (years)	186,416	5.48	6.92	0.00	98.25	49,465	3.69	4.98	0.00	100.00
Time to Maturity (years)	186,416	11.36	11.26	0.00	100.08	49,465	8.20	5.42	0.00	48.42
Industrial Sector (Dummy)	186,416	0.37	0.48	0.00	1.00	49,465	0.74	0.44	0.00	1.00
Financial Sector (Dummy)	186,416	0.32	0.47	0.00	1.00	49,465	0.10	0.30	0.00	1.00
Callable (Dummy)	186,416	0.26	0.44	0.00	1.00	49,465	0.71	0.45	0.00	1.00
Puttable (Dummy)	186,416	0.04	0.20	0.00	1.00	49,465	0.01	0.12	0.00	1.00
S&P500 Return (%)	186,416	2.16	3.29	-5.74	7.81	49,465	2.20	3.21	-5.74	7.81
10yr Treasury Return (%)	186,416	0.86	1.72	-2.90	5.49	49,465	0.95	1.71	-2.90	5.49
Stock Return (%))	67,476	2.23	7.19	-45.79	99.50	16,802	1.96	13.27	-84.39	161.90
Stock Volume (% of shares outst.)	67,725	6.95	6.05	0.01	313.89	16,957	11.24	11.85	0.01	286.78
Traded Equity (Dummy)	186,416	0.36	0.48	0.00	1.00	49,465	0.34	0.47	0.00	1.00

TABLE 22

Results from Tobit Regressions where Age and Size are Interacted with Traded Equity

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val
Amount Outstanding	**8.557** 0.28 0.00	**5.489** 0.47 0.00	**7.407** 0.20 0.00	**3.829** 0.23 0.00	**10.773** 0.27 0.00	**15.843** 0.90 0.00	**46.569** 0.42 0.00	**11.711** 0.53 0.00
AO*TE					**-1.338** 0.40 0.00	**1.596** 1.55 0.30	**-20.113** 0.72 0.00	**5.847** 1.05 0.00
Age of Bond	**-0.356** 0.01 0.00	**-0.215** 0.02 0.00	**-0.397** 0.01 0.00	**-0.381** 0.02 0.00	**-0.157** 0.01 0.00	**-0.314** 0.04 0.00	**-0.097** 0.02 0.00	**-1.102** 0.04 0.00
Age*TE					**-0.206** 0.02 0.00	**-0.195** 0.07 0.01	**-0.866** 0.04 0.00	**-0.315** 0.08 0.00
Abs(Bond Return)	**-1.277** 0.06 0.00	**-0.078** 0.03 0.00			**-0.956** 0.04 0.00	**-0.136** 0.04 0.00		
AGVT=Abs(10yr Treasury Return)	**0.395** 0.06 0.00	**-0.047** 0.09 0.59	**-0.158** 0.04 0.00	**-0.145** 0.06 0.01	**0.255** 0.04 0.00	**-0.411** 0.15 0.01	**-0.148** 0.06 0.02	**-0.195** 0.12 0.11
AGVT × Dummy(TTM>6 yrs)	**0.914** 0.06 0.00	**0.238** 0.09 0.01	**0.322** 0.04 0.00	**0.360** 0.06 0.00	**0.802** 0.04 0.00	**0.914** 0.15 0.00	**1.013** 0.07 0.00	**1.249** 0.13 0.00
Abs(S&P500 Return)	**-0.195** 0.02 0.00	**-0.088** 0.03 0.01	**-0.132** 0.02 0.00	**-0.073** 0.02 0.00	**-0.170** 0.01 0.00	**-0.358** 0.06 0.00	**-0.469** 0.02 0.00	**-0.432** 0.04 0.00
Traded Equity (Dummy)					**1.466** 0.13 0.00	**1.716** 0.48 0.00	**13.260** 0.25 0.00	**2.595** 0.40 0.00
Abs(Stock Return)	**0.021** 0.01 0.02	**-0.003** 0.01 0.70	**0.011** 0.01 0.08	**-0.005** 0.00 0.22				
Abs(Stock Return (-1))	**0.004** 0.01 0.68	**0.003** 0.01 0.68	**-0.008** 0.01 0.15	**-0.002** 0.00 0.68				
Abs(Stock Return (-2))	**0.007** 0.01 0.43	**-0.030** 0.01 0.00	**0.019** 0.01 0.00	**-0.018** 0.00 0.00				
Abs(Stock Return (-3))	**-0.002** 0.01 0.83	**-0.025** 0.01 0.00	**0.002** 0.01 0.77	**-0.016** 0.00 0.00				
Stock Volume	**0.030** 0.01 0.01	**0.027** 0.01 0.00	**0.040** 0.01 0.00	**0.018** 0.00 0.00				
Stock Volume (-1)	**0.002** 0.01 0.87	**-0.010** 0.01 0.28	**-0.026** 0.01 0.00	**-0.010** 0.00 0.03				
Stock Volume (-2)	**0.007** 0.01 0.56	**-0.016** 0.01 0.10	**0.006** 0.01 0.51	**-0.002** 0.00 0.72				
Stock Volume (-3)	**0.006** 0.01 0.55	**0.005** 0.01 0.55	**-0.001** 0.01 0.89	**-0.006** 0.00 0.21				
Credit Rating	**0.126** 0.02 0.00	**-0.008** 0.01 0.53	**-0.003** 0.02 0.87	**-0.043** 0.01 0.00	**0.172** 0.01 0.00	**-0.106** 0.02 0.00	**0.200** 0.03 0.00	**-0.343** 0.02 0.00
Time-to-Maturity (TTM)	**0.004** 0.00 0.38	**-0.044** 0.02 0.02	**-0.029** 0.00 0.00	**-0.014** 0.02 0.40	**0.000** 0.00 0.97	**-0.002** 0.03 0.96	**-0.045** 0.01 0.00	**0.250** 0.03 0.00
TTM × Callable	**-0.134** 0.01 0.00	**0.128** 0.03 0.00	**-0.025** 0.01 0.00	**0.043** 0.02 0.04	**-0.100** 0.01 0.00	**0.158** 0.04 0.00	**-0.026** 0.01 0.08	**0.150** 0.04 0.00
Callable (Dummy)	**1.269** 0.25 0.00	**-2.864** 0.28 0.00	**-2.110** 0.17 0.00	**-1.822** 0.20 0.00	**0.501** 0.16 0.00	**-4.614** 0.47 0.00	**-6.765** 0.28 0.00	**-3.412** 0.43 0.00
Bond Volume (-1)	**0.186** 0.01 0.00	**0.141** 0.02 0.00	**0.175** 0.01 0.00	**0.200** 0.02 0.00	**0.180** 0.01 0.00	**0.184** 0.03 0.00	**0.093** 0.01 0.00	**0.086** 0.01 0.00
Industrial Sector (Dummy)	**0.413** 0.15 0.01	**-0.237** 0.26 0.36	**0.592** 0.13 0.00	**-0.236** 0.18 0.19	**0.374** 0.08 0.00	**-1.132** 0.36 0.00	**-0.742** 0.17 0.00	**-1.282** 0.33 0.00
Financial Sector (Dummy)	**0.634** 0.16 0.00	**-0.166** 0.35 0.64	**0.424** 0.14 0.00	**-0.673** 0.25 0.01	**0.589** 0.08 0.00	**-1.081** 0.50 0.03	**-1.101** 0.17 0.00	**-1.718** 0.40 0.00
Constant	**-5.856** 0.25 0.00	**-2.711** 0.46 0.00	**-5.426** 0.20 0.00	**-3.065** 0.31 0.00	**-7.839** 0.14 0.00	**-13.450** 0.67 0.00	**-34.010** 0.27 0.00	**-23.537** 0.64 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42,683	12,184	81,355	34,104	126,121	37,283	436,741	142,263
Likelihood Ratio Test=$2(L_u - L_r)$	**3873**	**672**	**6091**	**1921**	**9617**	**1300**	**27109**	**4939**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 23

Results from Logit Regressions where Age and Size are Interacted with Traded Equity

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
Variables	Inv.Gr		High-Yield		Inv.Gr		High-Yield		Inv.Gr		High-Yield		Inv.Gr		High-Yield	
	Coef		**Coef**		**Coef**		**Coef**		**Coef**		**Coef**		**Coef**		**Coef**	
	SE	P-val	SE	P-val	SE	P-val	SE	P-val	SE	P-val	SE	P-val	SE	P-val	SE	P-val
Amount Outstanding	**4.103**		**2.773**		**3.160**		**1.757**		**3.991**		**2.448**		**5.360**		**2.147**	
	0.07	0.00	0.13	0.00	0.05	0.00	0.07	0.00	0.06	0.00	0.09	0.00	0.03	0.00	0.05	0.00
AO*TE									**0.123**		**0.271**		**-2.148**		**-0.458**	
									0.09	0.18	0.16	0.08	0.06	0.00	0.08	0.00
Age of Bond	**-0.065**		**-0.060**		**-0.081**		**-0.131**		**-0.022**		**-0.040**		**0.001**		**-0.104**	
	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00
Age*TE									**-0.040**		**-0.020**		**-0.081**		**-0.028**	
									0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00
Abs(Bond Return)	**-0.062**		**-0.011**						**-0.055**		**-0.013**					
	0.01	0.00	0.01	0.14					0.01	0.00	0.00	0.00				
AGVT=Abs(10yr Treasury Return)	**-0.017**		**-0.016**		**-0.037**		**-0.036**		**-0.010**		**-0.052**		**-0.023**		**-0.022**	
	0.01	0.16	0.02	0.48	0.01	0.00	0.02	0.02	0.01	0.14	0.01	0.00	0.00	0.00	0.01	0.01
AGVT × Dummy(TTM>6 yrs)	**0.120**		**0.074**		**0.073**		**0.104**		**0.117**		**0.119**		**0.089**		**0.101**	
	0.01	0.00	0.02	0.00	0.01	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.01	0.00
Abs(S&P500 Return)	**-0.042**		**-0.037**		**-0.028**		**-0.027**		**-0.035**		**-0.044**		**-0.031**		**-0.033**	
	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Traded Equity (Dummy)									**0.265**		**0.205**		**1.234**		**0.438**	
									0.03	0.00	0.05	0.00	0.02	0.00	0.03	0.00
Abs(Stock Return)	**0.002**		**-0.000**		**0.002**		**-0.002**									
	0.00	0.32	0.00	0.83	0.00	0.07	0.00	0.12								
Abs(Stock Return (-1))	**0.001**		**0.001**		**-0.000**		**-0.001**									
	0.00	0.49	0.00	0.59	0.00	0.81	0.00	0.47								
Abs(Stock Return (-2))	**0.003**		**-0.007**		**0.005**		**-0.005**									
	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.00								
Abs(Stock Return (-3))	**-0.000**		**-0.008**		**0.000**		**-0.005**									
	0.00	0.95	0.00	0.00	0.00	0.70	0.00	0.00								
Stock Volume	**0.007**		**0.007**		**0.007**		**0.006**									
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Stock Volume (-1)	**-0.002**		**-0.002**		**-0.004**		**-0.003**									
	0.00	0.44	0.00	0.32	0.00	0.02	0.00	0.06								
Stock Volume (-2)	**0.002**		**-0.004**		**0.000**		**-0.001**									
	0.00	0.48	0.00	0.16	0.00	0.84	0.00	0.51								
Stock Volume (-3)	**0.001**		**0.001**		**0.000**		**-0.002**									
	0.00	0.73	0.00	0.56	0.00	0.98	0.00	0.17								
Credit Rating	**-0.004**		**-0.003**		**-0.033**		**-0.013**		**0.012**		**-0.012**		**0.001**		**-0.034**	
	0.00	0.34	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.43	0.00	0.00
Time-to-Maturity (TTM)	**-0.011**		**-0.008**		**-0.011**		**-0.000**		**-0.010**		**-0.005**		**-0.006**		**0.016**	
	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00
TTM × Callable	**-0.018**		**0.028**		**0.002**		**0.001**		**-0.013**		**0.021**		**-0.000**		**0.011**	
	0.00	0.00	0.01	0.00	0.00	0.10	0.01	0.84	0.00	0.00	0.00	0.00	0.00	0.84	0.00	0.00
Callable (Dummy)	**0.105**		**-0.635**		**-0.538**		**-0.341**		**-0.045**		**-0.520**		**-0.488**		**-0.175**	
	0.05	0.04	0.07	0.00	0.03	0.00	0.05	0.00	0.03	0.12	0.04	0.00	0.02	0.00	0.03	0.00
Bond Volume (-1)	**0.033**		**0.049**		**0.032**		**0.064**		**0.033**		**0.013**		**0.006**		**0.006**	
	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial Sector (Dummy)	**0.105**		**-0.042**		**0.147**		**-0.024**		**0.045**		**-0.122**		**-0.093**		**-0.071**	
	0.03	0.00	0.07	0.54	0.02	0.00	0.05	0.62	0.02	0.00	0.03	0.00	0.01	0.00	0.02	0.00
Financial Sector (Dummy)	**0.279**		**0.051**		**0.212**		**-0.186**		**0.152**		**-0.128**		**-0.073**		**-0.155**	
	0.03	0.00	0.09	0.58	0.02	0.00	0.07	0.01	0.02	0.00	0.05	0.00	0.01	0.00	0.03	0.00
Constant	**-1.081**		**-0.770**		**-0.769**		**-0.698**		**-1.344**		**-0.835**		**-1.975**		**-1.143**	
	0.05	0.00	0.12	0.00	0.04	0.00	0.08	0.00	0.03	0.00	0.06	0.00	0.02	0.00	0.04	0.00
Observations	**67261**		**16633**		**121964**		**43000**		**186416**		**49465**		**550073**		**169117**	
Censored Observations	42683		12184		81355		34104		126121		37283		436741		142263	
Likelihood Ratio Test=$2(L_u - L_r)$	**6447**		**1064**		**11946**		**2790**		**17746**		**2624**		**63640**		**10013**	
P-Value of L-Ratio Test	**0.0000**		**0.0000**		**0.0000**		**0.0000**		**0.0000**		**0.0000**		**0.0000**		**0.0000**	

TABLE 24

Relative Sensitivity of Trading Volume to Each Variable (where Age and Size are Interacted with Traded Equity)

Effect of one-standard-deviation change in each explanatory variable on expected trading volume. The dependent variable, y =trading volume, represents the percentage of par amount outstanding traded per month. All numbers in the table represent the change in expected trading volume due to a one-standard-deviation change in each variable. All numbers are multiplied by 100 to represent percentages. The last row shows the expected trading volume at the average values of the variables, i.e. the "base-case expected value".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.571	0.247	0.453	0.129	0.586	0.583	1.074	0.223
AO*TE					-0.026	0.018	-0.141	0.034
Age of Bond	-0.408	-0.155	-0.435	-0.199	-0.220	-0.203	-0.067	-0.425
Age*TE					-0.082	-0.041	-0.133	-0.035
Abs(Bond Return)	-0.465	-0.030			-0.305	-0.044		
AGVT=Abs(10yr Treasury Return)	0.198	-0.017	-0.065	-0.037	0.112	-0.118	-0.035	-0.036
AGVT × Dummy(TTM>6 yrs)	0.304	0.060	0.086	0.065	0.216	0.187	0.125	0.137
Abs(S&P500 Return)	-0.191	-0.065	-0.135	-0.048	-0.149	-0.208	-0.276	-0.197
Traded Equity (Dummy)					0.149	0.110	0.505	0.084
Abs(Stock Return)	0.037	-0.007	0.020	-0.010				
Abs(Stock Return (-1))	0.007	0.007	-0.016	-0.003				
Abs(Stock Return (-2))	0.013	-0.063	0.035	-0.035				
Abs(Stock Return (-3))	-0.003	-0.053	0.003	-0.030				
Stock Volume	0.063	0.071	0.086	0.043				
Stock Volume (-1)	0.004	-0.025	-0.054	-0.023				
Stock Volume (-2)	0.014	-0.039	0.013	-0.004				
Stock Volume (-3)	0.013	0.013	-0.002	-0.013				
Credit Rating	0.251	-0.030	-0.005	-0.110	0.289	-0.301	0.189	-0.650
Time-to-Maturity (TTM)	0.015	-0.077	-0.096	-0.018	0.000	-0.002	-0.067	0.233
TTM × Callable	-0.129	0.170	-0.022	0.044	-0.115	0.173	-0.014	0.084
Callable (Dummy)	0.067	-0.378	-0.116	-0.205	0.036	-0.531	-0.237	-0.229
Bond Volume (-1)	0.078	0.023	0.060	0.019	0.061	0.025	0.022	0.010
Industrial Sector (Dummy)	0.076	-0.044	0.102	-0.034	0.038	-0.150	-0.039	-0.101
Financial Sector (Dummy)	0.057	-0.003	0.032	-0.009	0.051	-0.020	-0.073	-0.040
Base Case Expected Value	**1.782**	**0.900**	**1.697**	**0.625**	**1.639**	**1.924**	**2.503**	**1.723**

TABLE 25

Relative Sensitivity of Probability of Trading to Each Variable (where Age and Size are Interacted with Traded Equity)

Effect of one-standard-deviation change in each explanatory variable on the probability of a bond to trade. The dependent variable: $y = 1$ if the bond trades and $y = 0$ otherwise. Therefore, $E[y] = Prob(Trade)$. The last row in the table gives the probability of trade given the average value of the explanatory variables, i.e. the "base trading probability".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.198	0.105	0.152	0.053	0.168	0.088	0.122	0.042
AO*TE					0.002	0.003	-0.014	-0.003
Age of Bond	-0.059	-0.036	-0.073	-0.060	-0.025	-0.025	0.001	-0.038
Age*TE					-0.013	-0.004	-0.012	-0.003
Abs(Bond Return)	-0.019	-0.003			-0.015	-0.004		
AGVT=Abs(10yr Treasury Return)	-0.006	-0.005	-0.012	-0.008	-0.003	-0.015	-0.005	-0.004
AGVT × Dummy(TTM>6 yrs)	0.029	0.015	0.015	0.016	0.024	0.024	0.010	0.011
Abs(S&P500 Return)	-0.031	-0.022	-0.023	-0.015	-0.025	-0.025	-0.017	-0.015
Traded Equity (Dummy)					0.021	0.013	0.045	0.014
Abs(Stock Return)	0.002	-0.001	0.003	-0.003				
Abs(Stock Return (-1))	0.002	0.002	-0.000	-0.001				
Abs(Stock Return (-2))	0.004	-0.013	0.007	-0.008				
Abs(Stock Return (-3))	-0.000	-0.014	0.001	-0.008				
Stock Volume	0.012	0.016	0.013	0.012				
Stock Volume (-1)	-0.003	-0.005	-0.006	-0.005				
Stock Volume (-2)	0.003	-0.007	0.001	-0.002				
Stock Volume (-3)	0.001	0.003	0.000	-0.003				
Credit Rating	-0.006	-0.009	-0.043	-0.030	0.015	-0.035	0.001	-0.059
Time-to-Maturity (TTM)	-0.031	-0.012	-0.029	-0.000	-0.023	-0.007	-0.009	0.014
TTM × Callable	-0.013	0.030	0.002	0.001	-0.012	0.022	-0.000	0.006
Callable (Dummy)	0.004	-0.076	-0.024	-0.036	-0.003	-0.060	-0.016	-0.012
Bond Volume (-1)	0.010	0.007	0.009	0.005	0.009	0.002	0.001	0.001
Industrial Sector (Dummy)	0.014	-0.007	0.020	-0.003	0.004	-0.016	-0.005	-0.005
Financial Sector (Dummy)	0.019	0.001	0.013	-0.002	0.010	-0.002	-0.005	-0.004
Base Case Expected Value	**0.357**	**0.254**	**0.318**	**0.186**	**0.311**	**0.234**	**0.182**	**0.138**

TABLE 26

Results from Tobit Regressions with Bond Return Variable

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**
	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val
Amount Outstanding	**8.575**	**5.448**	**7.407**	**3.829**	**10.149**	**16.287**	**40.387**	**13.206**
	0.29 0.00	0.47 0.00	0.20 0.00	0.23 0.00	0.20 0.00	0.74 0.00	0.35 0.00	0.47 0.00
Age of Bond	**-0.359**	**-0.215**	**-0.397**	**-0.381**	**-0.191**	**-0.361**	**-0.207**	**-1.197**
	0.01 0.00	0.02 0.00	0.01 0.00	0.02 0.00	0.01 0.00	0.03 0.00	0.01 0.00	0.04 0.00
Bond Return	**-0.312**	**-0.008**			**-0.334**	**0.015**		
	0.03 0.00	0.02 0.72			0.02 0.00	0.03 0.64		
AGVT=Abs(10yr Treasury Return)	**-0.069**	**-0.061**	**-0.158**	**-0.145**	**-0.046**	**-0.466**	**-0.207**	**-0.207**
	0.06 0.22	0.09 0.48	0.04 0.00	0.06 0.01	0.04 0.19	0.15 0.00	0.06 0.00	0.12 0.09
AGVT × Dummy(TTM>6 yrs)	**0.460**	**0.225**	**0.322**	**0.360**	**0.525**	**0.912**	**1.148**	**1.254**
	0.05 0.00	0.09 0.01	0.04 0.00	0.06 0.00	0.04 0.00	0.15 0.00	0.07 0.00	0.13 0.00
Abs(S&P500 Return)	**-0.158**	**-0.087**	**-0.132**	**-0.073**	**-0.135**	**-0.358**	**-0.472**	**-0.427**
	0.02 0.00	0.03 0.01	0.02 0.00	0.02 0.00	0.01 0.00	0.06 0.00	0.02 0.00	0.04 0.00
Traded Equity (Dummy)					**0.389**	**1.469**	**5.766**	**2.940**
					0.06 0.00	0.25 0.00	0.14 0.00	0.24 0.00
Abs(Stock Return)	**0.016**	**-0.007**	**0.011**	**-0.005**				
	0.01 0.08	0.01 0.37	0.01 0.08	0.00 0.22				
Abs(Stock Return (-1))	**0.008**	**0.001**	**-0.008**	**-0.002**				
	0.01 0.38	0.01 0.89	0.01 0.15	0.00 0.68				
Abs(Stock Return (-2))	**0.002**	**-0.032**	**0.019**	**-0.018**				
	0.01 0.86	0.01 0.00	0.01 0.00	0.00 0.00				
Abs(Stock Return (-3))	**0.000**	**-0.026**	**0.002**	**-0.016**				
	0.01 0.97	0.01 0.00	0.01 0.77	0.00 0.00				
Stock Volume	**0.022**	**0.025**	**0.040**	**0.018**				
	0.01 0.04	0.01 0.00	0.01 0.00	0.00 0.00				
Stock Volume (-1)	**-0.009**	**-0.009**	**-0.026**	**-0.010**				
	0.01 0.47	0.01 0.32	0.01 0.00	0.00 0.03				
Stock Volume (-2)	**0.004**	**-0.016**	**0.006**	**-0.002**				
	0.01 0.73	0.01 0.11	0.01 0.51	0.00 0.72				
Stock Volume (-3)	**0.016**	**0.005**	**-0.001**	**-0.006**				
	0.01 0.15	0.01 0.54	0.01 0.89	0.00 0.21				
Credit Rating	**0.137**	**-0.010**	**-0.003**	**-0.043**	**0.177**	**-0.108**	**0.259**	**-0.337**
	0.02 0.00	0.01 0.44	0.02 0.87	0.01 0.00	0.01 0.00	0.02 0.00	0.03 0.00	0.02 0.00
Time-to-Maturity (TTM)	**-0.014**	**-0.048**	**-0.029**	**-0.014**	**-0.011**	**-0.008**	**-0.024**	**0.246**
	0.00 0.00	0.02 0.01	0.00 0.00	0.02 0.40	0.00 0.00	0.03 0.82	0.01 0.00	0.03 0.00
TTM × Callable	**-0.138**	**0.130**	**-0.025**	**0.043**	**-0.111**	**0.163**	**-0.043**	**0.157**
	0.01 0.00	0.03 0.00	0.01 0.00	0.02 0.04	0.01 0.00	0.04 0.00	0.01 0.00	0.04 0.00
Callable (Dummy)	**1.575**	**-2.854**	**-2.110**	**-1.822**	**0.796**	**-4.647**	**-6.832**	**-3.542**
	0.25 0.00	0.28 0.00	0.17 0.00	0.20 0.00	0.16 0.00	0.47 0.00	0.28 0.00	0.43 0.00
Bond Volume (-1)	**0.183**	**0.142**	**0.175**	**0.200**	**0.181**	**0.186**	**0.092**	**0.086**
	0.01 0.00	0.02 0.00	0.01 0.00	0.02 0.00	0.01 0.00	0.03 0.00	0.01 0.00	0.01 0.00
Industrial Sector (Dummy)	**0.480**	**-0.248**	**0.592**	**-0.236**	**0.295**	**-1.216**	**-1.091**	**-1.379**
	0.15 0.00	0.26 0.34	0.13 0.00	0.18 0.19	0.08 0.00	0.36 0.00	0.17 0.00	0.33 0.00
Financial Sector (Dummy)	**0.741**	**-0.176**	**0.424**	**-0.673**	**0.596**	**-1.150**	**-1.081**	**-1.821**
	0.16 0.00	0.35 0.62	0.14 0.00	0.25 0.01	0.08 0.00	0.50 0.02	0.17 0.00	0.40 0.00
Constant	**-6.089**	**-2.655**	**-5.426**	**-3.065**	**-7.797**	**-13.421**	**-33.048**	**-23.482**
	0.25 0.00	0.46 0.00	0.20 0.00	0.31 0.00	0.14 0.00	0.66 0.00	0.27 0.00	0.63 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**3453**	**664**	**6091**	**1921**	**8944**	**1277**	**25810**	**4885**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 27

Results from Logit Regressions with Bond Return Variable

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**
	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val
Amount Outstanding	**4.102**	**2.765**	**3.160**	**1.757**	**4.028**	**2.522**	**4.786**	**1.992**
	0.07 0.00	0.13 0.00	0.05 0.00	0.07 0.00	0.05 0.00	0.07 0.00	0.03 0.00	0.04 0.00
Age of Bond	**-0.065**	**-0.060**	**-0.081**	**-0.131**	**-0.028**	**-0.045**	**-0.011**	**-0.112**
	0.00 0.00	0.01 0.00	0.00 0.00	0.01 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Bond Return	**-0.018**	**0.002**			**-0.031**	**0.004**		
	0.01 0.00	0.01 0.71			0.00 0.00	0.00 0.16		
AGVT=Abs(10yr Treasury Return)	**-0.038**	**-0.019**	**-0.037**	**-0.036**	**-0.024**	**-0.057**	**-0.029**	**-0.022**
	0.01 0.00	0.02 0.41	0.01 0.00	0.02 0.02	0.01 0.00	0.01 0.00	0.00 0.00	0.01 0.01
AGVT × Dummy(TTM>6 yrs)	**0.099**	**0.072**	**0.073**	**0.104**	**0.108**	**0.118**	**0.101**	**0.102**
	0.01 0.00	0.02 0.00	0.01 0.00	0.02 0.00	0.01 0.00	0.01 0.00	0.00 0.00	0.01 0.00
Abs(S&P500 Return)	**-0.039**	**-0.037**	**-0.028**	**-0.027**	**-0.032**	**-0.044**	**-0.032**	**-0.033**
	0.00 0.00	0.01 0.00	0.00 0.00	0.01 0.00	0.00 0.00	0.01 0.00	0.00 0.00	0.00 0.00
Traded Equity (Dummy)					**0.135**	**0.202**	**0.508**	**0.277**
					0.01 0.00	0.02 0.00	0.01 0.00	0.02 0.00
Abs(Stock Return)	**0.002**	**-0.001**	**0.002**	**-0.002**				
	0.00 0.37	0.00 0.63	0.00 0.07	0.00 0.12				
Abs(Stock Return (-1))	**0.001**	**0.001**	**-0.000**	**-0.001**				
	0.00 0.43	0.00 0.69	0.00 0.81	0.00 0.47				
Abs(Stock Return (-2))	**0.003**	**-0.008**	**0.005**	**-0.005**				
	0.00 0.10	0.00 0.00	0.00 0.00	0.00 0.00				
Abs(Stock Return (-3))	**0.000**	**-0.008**	**0.000**	**-0.005**				
	0.00 0.99	0.00 0.00	0.00 0.70	0.00 0.00				
Stock Volume	**0.007**	**0.007**	**0.007**	**0.006**				
	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00				
Stock Volume (-1)	**-0.002**	**-0.002**	**-0.004**	**-0.003**				
	0.00 0.32	0.00 0.33	0.00 0.02	0.00 0.06				
Stock Volume (-2)	**0.002**	**-0.004**	**0.000**	**-0.001**				
	0.00 0.51	0.00 0.17	0.00 0.84	0.00 0.51				
Stock Volume (-3)	**0.001**	**0.001**	**0.000**	**-0.002**				
	0.00 0.58	0.00 0.58	0.00 0.98	0.00 0.17				
Credit Rating	**-0.003**	**-0.003**	**-0.033**	**-0.013**	**0.013**	**-0.013**	**0.008**	**-0.034**
	0.00 0.42	0.00 0.35	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Time-to-Maturity (TTM)	**-0.012**	**-0.009**	**-0.011**	**-0.000**	**-0.010**	**-0.005**	**-0.005**	**0.016**
	0.00 0.00	0.00 0.07	0.00 0.00	0.00 0.99	0.00 0.00	0.00 0.08	0.00 0.00	0.00 0.00
TTM × Callable	**-0.018**	**0.028**	**0.002**	**0.001**	**-0.015**	**0.022**	**-0.002**	**0.010**
	0.00 0.00	0.01 0.00	0.00 0.10	0.01 0.84	0.00 0.00	0.00 0.00	0.00 0.04	0.00 0.00
Callable (Dummy)	**0.119**	**-0.634**	**-0.538**	**-0.341**	**-0.007**	**-0.522**	**-0.482**	**-0.168**
	0.05 0.02	0.07 0.00	0.03 0.00	0.05 0.00	0.03 0.82	0.04 0.00	0.02 0.00	0.03 0.00
Bond Volume (-1)	**0.033**	**0.049**	**0.032**	**0.064**	**0.034**	**0.013**	**0.006**	**0.006**
	0.00 0.00	0.01 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00	0.00 0.00
Industrial Sector (Dummy)	**0.108**	**-0.043**	**0.147**	**-0.024**	**0.025**	**-0.131**	**-0.133**	**-0.074**
	0.03 0.00	0.07 0.53	0.02 0.00	0.05 0.62	0.02 0.10	0.03 0.00	0.01 0.00	0.02 0.00
Financial Sector (Dummy)	**0.284**	**0.050**	**0.212**	**-0.186**	**0.139**	**-0.137**	**-0.075**	**-0.160**
	0.03 0.00	0.09 0.59	0.02 0.00	0.07 0.01	0.01 0.00	0.05 0.00	0.01 0.00	0.03 0.00
Constant	**-1.091**	**-0.763**	**-0.769**	**-0.698**	**-1.335**	**-0.835**	**-1.888**	**-1.084**
	0.05 0.00	0.12 0.00	0.04 0.00	0.08 0.00	0.02 0.00	0.06 0.00	0.02 0.00	0.04 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**6424**	**1062**	**11946**	**2790**	**17541**	**2600**	**61094**	**9968**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 28

Relative Sensitivity of Trading Volume to Each Variable (with Bond Return Variable)

Effect of one-standard-deviation change in each explanatory variable on the expected trading volume of a bond in each sample. The dependent variable, y =trading volume, is standardized to represent the percentage of par amount outstanding traded per month. All numbers in the table represent the change in expected trading volume due to a one standard deviation change in each explanatory variable. All numbers are multiplied by 100 to represent percentages. The last row in the table gives the expected trading volume given the average values of the explanatory variables, i.e. the "base expected value".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.572	0.245	0.453	0.129	0.548	0.601	0.920	0.253
Age of Bond	-0.411	-0.154	-0.435	-0.199	-0.266	-0.232	-0.142	-0.457
Bond Return	-0.084	-0.002			-0.077	0.003		
AGVT=Abs(10yr Treasury Return)	-0.033	-0.022	-0.065	-0.037	-0.020	-0.134	-0.049	-0.038
AGVT × Dummy(TTM>6 yrs)	0.149	0.056	0.086	0.065	0.139	0.187	0.143	0.138
Abs(S&P500 Return)	-0.156	-0.063	-0.135	-0.048	-0.118	-0.208	-0.279	-0.195
Traded Equity (Dummy)					0.039	0.094	0.212	0.096
Abs(Stock Return)	0.029	-0.016	0.020	-0.010				
Abs(Stock Return (-1))	0.014	0.002	-0.016	-0.003				
Abs(Stock Return (-2))	0.003	-0.067	0.035	-0.035				
Abs(Stock Return (-3))	0.001	-0.054	0.003	-0.030				
Stock Volume	0.048	0.066	0.086	0.043				
Stock Volume (-1)	-0.018	-0.023	-0.054	-0.023				
Stock Volume (-2)	0.009	-0.039	0.013	-0.004				
Stock Volume (-3)	0.033	0.013	-0.002	-0.013				
Credit Rating	0.274	-0.037	-0.005	-0.110	0.299	-0.307	0.249	-0.641
Time-to-Maturity (TTM)	-0.052	-0.083	-0.096	-0.018	-0.032	-0.012	-0.036	0.229
TTM × Callable	-0.132	0.172	-0.022	0.044	-0.127	0.179	-0.023	0.088
Callable (Dummy)	0.084	-0.377	-0.116	-0.205	0.057	-0.535	-0.241	-0.237
Bond Volume (-1)	0.077	0.023	0.060	0.019	0.061	0.026	0.022	0.010
Industrial Sector (Dummy)	0.089	-0.046	0.102	-0.034	0.030	-0.161	-0.058	-0.108
Financial Sector (Dummy)	0.067	-0.003	0.032	-0.009	0.052	-0.021	-0.072	-0.043
Base Case Expected Value	**1.796**	**0.901**	**1.697**	**0.625**	**1.647**	**1.926**	**2.521**	**1.723**

TABLE 29

Relative Sensitivity of Probability of Trading to Each Variable (with Bond Return Variable)

Effect of one-standard-deviation change in each explanatory variable on the probability of a bond to trade. The dependent variable: $y = 1$ if the bond trades and $y = 0$ otherwise. Therefore, $E[y] = Prob(Trade)$. The last row in the table gives the probability of trade given the average value of the explanatory variables, i.e. the "base trading probability".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.198	0.105	0.152	0.053	0.170	0.091	0.108	0.039
Age of Bond	-0.058	-0.036	-0.073	-0.060	-0.032	-0.029	-0.007	-0.041
Bond Return	-0.004	0.000			-0.006	0.001		
AGVT=Abs(10yr Treasury Return)	-0.014	-0.006	-0.012	-0.008	-0.008	-0.016	-0.006	-0.004
AGVT × Dummy(TTM>6 yrs)	0.024	0.015	0.015	0.016	0.022	0.024	0.012	0.011
Abs(S&P500 Return)	-0.030	-0.022	-0.023	-0.015	-0.022	-0.025	-0.018	-0.014
Traded Equity (Dummy)					0.011	0.013	0.018	0.009
Abs(Stock Return)	0.002	-0.002	0.003	-0.003				
Abs(Stock Return (-1))	0.002	0.002	-0.000	-0.001				
Abs(Stock Return (-2))	0.004	-0.013	0.007	-0.008				
Abs(Stock Return (-3))	0.000	-0.014	0.001	-0.008				
Stock Volume	0.011	0.015	0.013	0.012				
Stock Volume (-1)	-0.004	-0.005	-0.006	-0.005				
Stock Volume (-2)	0.002	-0.007	0.001	-0.002				
Stock Volume (-3)	0.002	0.003	0.000	-0.003				
Credit Rating	-0.005	-0.010	-0.043	-0.030	0.017	-0.036	0.007	-0.060
Time-to-Maturity (TTM)	-0.034	-0.013	-0.029	-0.000	-0.024	-0.008	-0.006	0.014
TTM × Callable	-0.014	0.030	0.002	0.001	-0.014	0.023	-0.001	0.006
Callable (Dummy)	0.005	-0.075	-0.024	-0.036	-0.000	-0.060	-0.016	-0.011
Bond Volume (-1)	0.010	0.007	0.009	0.005	0.009	0.002	0.001	0.001
Industrial Sector (Dummy)	0.015	-0.007	0.020	-0.003	0.002	-0.017	-0.007	-0.006
Financial Sector (Dummy)	0.019	0.001	0.013	-0.002	0.009	-0.002	-0.005	-0.004
Base-Case Trading Probability	**0.357**	**0.254**	**0.318**	**0.186**	**0.310**	**0.234**	**0.184**	**0.138**

TABLE 30

Results from Tobit Regressions (with Bond Returns Squared)

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**
	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val
Amount Outstanding	**8.590**	**5.444**	**7.407**	**3.829**	**10.153**	**16.303**	**40.387**	**13.206**
	0.288 0.00	0.470 0.00	0.202 0.00	0.227 0.00	0.204 0.00	0.740 0.00	0.349 0.00	0.475 0.00
Age of Bond	**-0.361**	**-0.215**	**-0.397**	**-0.381**	**-0.193**	**-0.362**	**-0.207**	**-1.197**
	0.015 0.00	0.023 0.00	0.012 0.00	0.017 0.00	0.007 0.00	0.032 0.00	0.015 0.00	0.036 0.00
(Bond Return)^2	**-0.036**	**-0.000**			**-0.007**	**-0.001**		
	0.007 0.00	0.001 0.53			0.002 0.00	0.001 0.09		
AGVT=Abs(10yr Treasury Return)	**-0.127**	**-0.064**	**-0.158**	**-0.145**	**-0.167**	**-0.456**	**-0.207**	**-0.207**
	0.056 0.02	0.087 0.46	0.041 0.00	0.057 0.01	0.035 0.00	0.153 0.00	0.062 0.00	0.123 0.09
AGVT × Dummy(TTM>6 yrs)	**0.452**	**0.225**	**0.322**	**0.360**	**0.451**	**0.908**	**1.148**	**1.254**
	0.056 0.00	0.089 0.01	0.043 0.00	0.060 0.00	0.036 0.00	0.153 0.00	0.069 0.00	0.131 0.00
Abs(S&P500 Return)	**-0.194**	**-0.088**	**-0.132**	**-0.073**	**-0.173**	**-0.357**	**-0.472**	**-0.427**
	0.021 0.00	0.035 0.01	0.015 0.00	0.019 0.00	0.014 0.00	0.059 0.00	0.024 0.00	0.043 0.00
Traded Equity (Dummy)					**0.383**	**1.463**	**5.766**	**2.940**
					0.064 0.00	0.249 0.00	0.141 0.00	0.241 0.00
Abs(Stock Return)	**0.015**	**-0.007**	**0.011**	**-0.005**				
	0.009 0.11	0.008 0.41	0.006 0.08	0.004 0.22				
Abs(Stock Return (-1))	**0.008**	**0.002**	**-0.008**	**-0.002**				
	0.009 0.36	0.008 0.85	0.006 0.15	0.004 0.68				
Abs(Stock Return (-2))	**0.003**	**-0.032**	**0.019**	**-0.018**				
	0.009 0.77	0.008 0.00	0.006 0.00	0.004 0.00				
Abs(Stock Return (-3))	**0.000**	**-0.026**	**0.002**	**-0.016**				
	0.009 0.97	0.008 0.00	0.006 0.77	0.004 0.00				
Stock Volume	**0.026**	**0.026**	**0.040**	**0.018**				
	0.011 0.02	0.008 0.00	0.008 0.00	0.004 0.00				
Stock Volume (-1)	**-0.003**	**-0.009**	**-0.026**	**-0.010**				
	0.012 0.83	0.009 0.30	0.009 0.00	0.005 0.03				
Stock Volume (-2)	**0.008**	**-0.016**	**0.006**	**-0.002**				
	0.012 0.49	0.010 0.10	0.009 0.51	0.005 0.72				
Stock Volume (-3)	**0.008**	**0.005**	**-0.001**	**-0.006**				
	0.011 0.48	0.009 0.55	0.008 0.89	0.005 0.21				
Credit Risk (by S&P Rating)	**0.132**	**-0.010**	**-0.003**	**-0.043**	**0.175**	**-0.107**	**0.259**	**-0.337**
	0.021 0.00	0.013 0.45	0.017 0.87	0.009 0.00	0.013 0.00	0.022 0.00	0.028 0.00	0.021 0.00
Time-to-Maturity (TTM)	**-0.012**	**-0.048**	**-0.029**	**-0.014**	**-0.011**	**-0.007**	**-0.024**	**0.246**
	0.005 0.01	0.019 0.01	0.004 0.00	0.016 0.40	0.003 0.00	0.033 0.83	0.007 0.00	0.031 0.00
TTM × Callable	**-0.139**	**0.130**	**-0.025**	**0.043**	**-0.112**	**0.162**	**-0.043**	**0.157**
	0.011 0.00	0.029 0.00	0.009 0.00	0.021 0.04	0.007 0.00	0.044 0.00	0.015 0.00	0.043 0.00
Callable (Dummy)	**1.587**	**-2.858**	**-2.110**	**-1.822**	**0.837**	**-4.635**	**-6.832**	**-3.542**
	0.252 0.00	0.284 0.00	0.173 0.00	0.199 0.00	0.158 0.00	0.466 0.00	0.284 0.00	0.431 0.00
Bond Volume (-1)	**0.184**	**0.142**	**0.175**	**0.200**	**0.183**	**0.186**	**0.092**	**0.086**
	0.008 0.00	0.023 0.00	0.007 0.00	0.016 0.00	0.006 0.00	0.026 0.00	0.006 0.00	0.005 0.00
Industrial Sector (Dummy)	**0.461**	**-0.248**	**0.592**	**-0.236**	**0.300**	**-1.202**	**-1.091**	**-1.379**
	0.149 0.00	0.261 0.34	0.125 0.00	0.178 0.19	0.083 0.00	0.358 0.00	0.172 0.00	0.331 0.00
Financial Sector (Dummy)	**0.712**	**-0.176**	**0.424**	**-0.673**	**0.594**	**-1.140**	**-1.081**	**-1.821**
	0.162 0.00	0.355 0.62	0.137 0.00	0.245 0.01	0.083 0.00	0.495 0.02	0.169 0.00	0.398 0.00
Constant	**-6.045**	**-2.669**	**-5.426**	**-3.065**	**-7.662**	**-13.430**	**-33.048**	**-23.482**
	0.256 0.00	0.458 0.00	0.204 0.00	0.309 0.00	0.137 0.00	0.657 0.00	0.272 0.00	0.631 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**3382**	**664**	**6091**	**1921**	**8691**	**1280**	**25810**	**4885**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 31

Results from Logit Regressions (with Bond Returns Squared)

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val
Amount Outstanding	**4.100** 0.074 0.00	**2.766** 0.133 0.00	**3.160** 0.047 0.00	**1.757** 0.069 0.00	**4.025** 0.046 0.00	**2.525** 0.072 0.00	**4.786** 0.027 0.00	**1.992** 0.041 0.00
Age of Bond	**-0.065** 0.003 0.00	**-0.060** 0.007 0.00	**-0.081** 0.002 0.00	**-0.131** 0.005 0.00	**-0.028** 0.001 0.00	**-0.045** 0.003 0.00	**-0.011** 0.001 0.00	**-0.112** 0.003 0.00
(Bond Return)^2	**-0.001** 0.001 0.39	**-0.000** 0.000 0.40			**-0.001** 0.000 0.04	**-0.000** 0.000 0.05		
AGVT=Abs(10yr Treasury Return)	**-0.044** 0.011 0.00	**-0.019** 0.023 0.42	**-0.037** 0.007 0.00	**-0.036** 0.016 0.02	**-0.035** 0.006 0.00	**-0.055** 0.014 0.00	**-0.029** 0.004 0.00	**-0.022** 0.008 0.01
AGVT × Dummy(TTM>6 yrs)	**0.096** 0.011 0.00	**0.072** 0.023 0.00	**0.073** 0.008 0.00	**0.104** 0.016 0.00	**0.101** 0.006 0.00	**0.119** 0.014 0.00	**0.101** 0.004 0.00	**0.102** 0.009 0.00
Abs(S&P500 Return)	**-0.042** 0.004 0.00	**-0.037** 0.009 0.00	**-0.028** 0.003 0.00	**-0.027** 0.005 0.00	**-0.036** 0.003 0.00	**-0.044** 0.005 0.00	**-0.032** 0.001 0.00	**-0.033** 0.003 0.00
Traded Equity (Dummy)					**0.134** 0.012 0.00	**0.201** 0.023 0.00	**0.508** 0.008 0.00	**0.277** 0.015 0.00
Abs(Stock Return)	**0.002** 0.002 0.41	**-0.001** 0.002 0.71	**0.002** 0.001 0.07	**-0.002** 0.001 0.12				
Abs(Stock Return (-1))	**0.001** 0.002 0.41	**0.001** 0.002 0.64	**-0.000** 0.001 0.81	**-0.001** 0.001 0.47				
Abs(Stock Return (-2))	**0.003** 0.002 0.10	**-0.007** 0.002 0.00	**0.005** 0.001 0.00	**-0.005** 0.001 0.00				
Abs(Stock Return (-3))	**0.000** 0.002 1.00	**-0.008** 0.002 0.00	**0.000** 0.001 0.70	**-0.005** 0.001 0.00				
Stock Volume	**0.007** 0.002 0.00	**0.007** 0.002 0.00	**0.007** 0.001 0.00	**0.006** 0.001 0.00				
Stock Volume (-1)	**-0.002** 0.002 0.39	**-0.002** 0.002 0.32	**-0.004** 0.002 0.02	**-0.003** 0.001 0.06				
Stock Volume (-2)	**0.002** 0.002 0.46	**-0.004** 0.003 0.16	**0.000** 0.002 0.84	**-0.001** 0.001 0.51				
Stock Volume (-3)	**0.001** 0.002 0.72	**0.001** 0.002 0.57	**0.000** 0.001 0.98	**-0.002** 0.001 0.17				
Credit Risk (by S&P Rating)	**-0.004** 0.004 0.39	**-0.003** 0.003 0.36	**-0.033** 0.003 0.00	**-0.013** 0.003 0.00	**0.013** 0.002 0.00	**-0.013** 0.002 0.00	**0.008** 0.002 0.00	**-0.034** 0.001 0.00
Time-to-Maturity (TTM)	**-0.012** 0.001 0.00	**-0.009** 0.005 0.07	**-0.011** 0.001 0.00	**-0.000** 0.004 0.99	**-0.010** 0.001 0.00	**-0.005** 0.003 0.09	**-0.005** 0.000 0.00	**0.016** 0.002 0.00
TTM × Callable	**-0.018** 0.002 0.00	**0.028** 0.008 0.00	**0.002** 0.002 0.10	**0.001** 0.006 0.84	**-0.015** 0.001 0.00	**0.021** 0.004 0.00	**-0.002** 0.001 0.04	**0.010** 0.003 0.00
Callable (Dummy)	**0.121** 0.051 0.02	**-0.634** 0.074 0.00	**-0.538** 0.031 0.00	**-0.341** 0.054 0.00	**-0.003** 0.029 0.91	**-0.520** 0.042 0.00	**-0.482** 0.018 0.00	**-0.168** 0.028 0.00
Bond Volume (-1)	**0.033** 0.002 0.00	**0.049** 0.006 0.00	**0.032** 0.001 0.00	**0.064** 0.005 0.00	**0.034** 0.001 0.00	**0.013** 0.003 0.00	**0.006** 0.000 0.00	**0.006** 0.001 0.00
Industrial Sector (Dummy)	**0.107** 0.030 0.00	**-0.043** 0.068 0.53	**0.147** 0.023 0.00	**-0.024** 0.048 0.62	**0.025** 0.015 0.10	**-0.130** 0.032 0.00	**-0.133** 0.011 0.00	**-0.074** 0.022 0.00
Financial Sector (Dummy)	**0.282** 0.032 0.00	**0.051** 0.093 0.58	**0.212** 0.025 0.00	**-0.186** 0.067 0.01	**0.139** 0.015 0.00	**-0.135** 0.045 0.00	**-0.075** 0.010 0.00	**-0.160** 0.027 0.00
Constant	**-1.083** 0.051 0.00	**-0.767** 0.120 0.00	**-0.769** 0.037 0.00	**-0.698** 0.084 0.00	**-1.322** 0.025 0.00	**-0.837** 0.060 0.00	**-1.888** 0.017 0.00	**-1.084** 0.042 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**6417**	**1063**	**11946**	**2790**	**17481**	**2603**	**61094**	**9968**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 32

Relative Sensitivity of Trading Volume to Each Variable (with Bond Returns Squared)

Effect of one-standard-deviation change in each explanatory variable on the expected trading volume of a bond in each sample. The dependent variable, y =trading volume, is standardized to represent the percentage of par amount outstanding traded per month. All numbers in the table represent the change in expected trading volume due to a one standard deviation change in each explanatory variable. All numbers are multiplied by 100 to represent percentages. The last row in the table gives the expected trading volume given the average values of the explanatory variables, i.e. the "base expected value".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.572	0.245	0.453	0.129	0.549	0.602	0.920	0.253
Age of Bond	-0.413	-0.154	-0.435	-0.199	-0.268	-0.233	-0.142	-0.457
(Bond Return)^2	-0.036	-0.001			-0.006	-0.004		
AGVT=Abs(10yr Treasury Return)	-0.061	-0.023	-0.065	-0.037	-0.070	-0.131	-0.049	-0.038
AGVT × Dummy(TTM>6 yrs)	0.146	0.056	0.086	0.065	0.119	0.186	0.143	0.138
Abs(S&P500 Return)	-0.190	-0.064	-0.135	-0.048	-0.151	-0.208	-0.279	-0.195
Traded Equity (Dummy)					0.038	0.094	0.212	0.096
Abs(Stock Return)	0.026	-0.014	0.020	-0.010				
Abs(Stock Return (-1))	0.015	0.003	-0.016	-0.003				
Abs(Stock Return (-2))	0.005	-0.066	0.035	-0.035				
Abs(Stock Return (-3))	0.001	-0.054	0.003	-0.030				
Stock Volume	0.055	0.068	0.086	0.043				
Stock Volume (-1)	-0.005	-0.024	-0.054	-0.023				
Stock Volume (-2)	0.017	-0.039	0.013	-0.004				
Stock Volume (-3)	0.016	0.013	-0.002	-0.013				
Credit Risk (by S&P Rating)	0.265	-0.036	-0.005	-0.110	0.295	-0.304	0.249	-0.641
Time-to-Maturity (TTM)	-0.045	-0.083	-0.096	-0.018	-0.033	-0.011	-0.036	0.229
TTM × Callable	-0.133	0.173	-0.022	0.044	-0.129	0.178	-0.023	0.088
Callable (Dummy)	0.085	-0.378	-0.116	-0.205	0.060	-0.533	-0.241	-0.237
Bond Volume (-1)	0.077	0.023	0.060	0.019	0.062	0.026	0.022	0.010
Industrial Sector (Dummy)	0.085	-0.046	0.102	-0.034	0.030	-0.159	-0.058	-0.108
Financial Sector (Dummy)	0.064	-0.003	0.032	-0.009	0.052	-0.021	-0.072	-0.043
Base Case Expected Value	**1.798**	**0.901**	**1.697**	**0.625**	**1.651**	**1.925**	**2.521**	**1.723**

TABLE 33

Relative Sensitivity of Probability of Trading to Each Variable (with Bond Returns Squared)

Effect of one-standard-deviation change in each explanatory variable on the probability of a bond to trade. The dependent variable: $y = 1$ if the bond trades and $y = 0$ otherwise. Therefore, $E[y] = Prob(Trade)$. The last row in the table gives the probability of trade given the average value of the explanatory variables, i.e. the "base trading probability".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.198	0.105	0.152	0.053	0.170	0.091	0.108	0.039
Age of Bond	-0.059	-0.036	-0.073	-0.060	-0.032	-0.029	-0.007	-0.041
(Bond Return)^2	-0.001	-0.000			-0.001	-0.001		
AGVT=Abs(10yr Treasury Return)	-0.016	-0.006	-0.012	-0.008	-0.012	-0.016	-0.006	-0.004
AGVT × Dummy(TTM>6 yrs)	0.023	0.015	0.015	0.016	0.021	0.024	0.012	0.011
Abs(S&P500 Return)	-0.031	-0.022	-0.023	-0.015	-0.025	-0.025	-0.018	-0.014
Traded Equity (Dummy)					0.011	0.013	0.018	0.009
Abs(Stock Return)	0.002	-0.001	0.003	-0.003				
Abs(Stock Return (-1))	0.002	0.002	-0.000	-0.001				
Abs(Stock Return (-2))	0.004	-0.013	0.007	-0.008				
Abs(Stock Return (-3))	0.000	-0.014	0.001	-0.008				
Stock Volume	0.012	0.015	0.013	0.012				
Stock Volume (-1)	-0.003	-0.005	-0.006	-0.005				
Stock Volume (-2)	0.003	-0.007	0.001	-0.002				
Stock Volume (-3)	0.001	0.003	0.000	-0.003				
Credit Risk (by S&P Rating)	-0.005	-0.010	-0.043	-0.030	0.016	-0.035	0.007	-0.060
Time-to-Maturity (TTM)	-0.034	-0.013	-0.029	-0.000	-0.024	-0.008	-0.006	0.014
TTM × Callable	-0.014	0.030	0.002	0.001	-0.014	0.023	-0.001	0.006
Callable (Dummy)	0.005	-0.075	-0.024	-0.036	-0.000	-0.060	-0.016	-0.011
Bond Volume (-1)	0.010	0.007	0.009	0.005	0.009	0.002	0.001	0.001
Industrial Sector (Dummy)	0.015	-0.007	0.020	-0.003	0.002	-0.017	-0.007	-0.006
Financial Sector (Dummy)	0.019	0.001	0.013	-0.002	0.009	-0.002	-0.005	-0.004
Base Case Expected Value	**0.357**	**0.254**	**0.318**	**0.186**	**0.310**	**0.234**	**0.184**	**0.138**

TABLE 34

Results from Tobit Regressions (with Stock Returns Squared)

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**
	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val
Amount Outstanding	**8.576**	**5.463**	**7.421**	**3.819**	**10.212**	**16.399**	**40.387**	**13.206**
	0.284 0.00	0.471 0.00	0.202 0.00	0.227 0.00	0.203 0.00	0.741 0.00	0.349 0.00	0.475 0.00
Age of Bond	**-0.356**	**-0.213**	**-0.397**	**-0.376**	**-0.189**	**-0.365**	**-0.207**	**-1.197**
	0.015 0.00	0.022 0.00	0.012 0.00	0.017 0.00	0.007 0.00	0.032 0.00	0.015 0.00	0.036 0.00
Abs(Bond Return)	**-1.283**	**-0.075**			**-0.955**	**-0.135**		
	0.056 0.00	0.028 0.01			0.036 0.00	0.039 0.00		
AGVT=Abs(10yr Treasury Return)	**0.399**	**-0.048**	**-0.160**	**-0.139**	**0.234**	**-0.426**	**-0.207**	**-0.207**
	0.060 0.00	0.087 0.59	0.041 0.00	0.057 0.02	0.038 0.00	0.153 0.01	0.062 0.00	0.123 0.09
AGVT × Dummy(TTM>6 yrs)	**0.915**	**0.236**	**0.321**	**0.358**	**0.836**	**0.927**	**1.148**	**1.254**
	0.059 0.00	0.089 0.01	0.043 0.00	0.060 0.00	0.038 0.00	0.153 0.00	0.069 0.00	0.131 0.00
Abs(S&P500 Return)	**-0.193**	**-0.090**	**-0.129**	**-0.084**	**-0.172**	**-0.357**	**-0.472**	**-0.427**
	0.021 0.00	0.035 0.01	0.015 0.00	0.019 0.00	0.014 0.00	0.059 0.00	0.024 0.00	0.043 0.00
Traded Equity (Dummy)					**0.379**	**1.457**	**5.766**	**2.940**
					0.064 0.00	0.249 0.00	0.141 0.00	0.241 0.00
Stock Return Squared	**0.001**	**-0.000**	**0.000**	**0.000**				
	0.000 0.01	0.000 0.31	0.000 0.02	0.000 0.08				
Stock Return Squared (-1)	**-0.000**	**0.000**	**-0.000**	**-0.000**				
	0.000 0.32	0.000 0.97	0.000 0.10	0.000 0.37				
Stock Return Squared (-2)	**0.001**	**-0.001**	**0.001**	**-0.000**				
	0.000 0.09	0.000 0.00	0.000 0.00	0.000 0.00				
Stock Return Squared (-3)	**0.000**	**-0.001**	**-0.000**	**-0.000**				
	0.000 0.92	0.000 0.00	0.000 0.33	0.000 0.00				
Stock Volume	**0.028**	**0.029**	**0.038**	**0.015**				
	0.011 0.01	0.008 0.00	0.008 0.00	0.004 0.00				
Stock Volume (-1)	**0.006**	**-0.010**	**-0.024**	**-0.009**				
	0.012 0.61	0.009 0.29	0.009 0.01	0.005 0.05				
Stock Volume (-2)	**0.003**	**-0.019**	**0.006**	**-0.002**				
	0.012 0.79	0.010 0.06	0.009 0.51	0.005 0.70				
Stock Volume (-3)	**0.007**	**0.006**	**0.001**	**-0.006**				
	0.011 0.51	0.009 0.52	0.008 0.86	0.005 0.21				
Credit Risk (by S&P Rating)	**0.125**	**-0.008**	**-0.003**	**-0.043**	**0.180**	**-0.104**	**0.259**	**-0.337**
	0.021 0.00	0.013 0.56	0.017 0.88	0.009 0.00	0.013 0.00	0.022 0.00	0.028 0.00	0.021 0.00
Time-to-Maturity (TTM)	**0.004**	**-0.044**	**-0.029**	**-0.012**	**0.004**	**-0.002**	**-0.024**	**0.246**
	0.005 0.35	0.019 0.02	0.004 0.00	0.016 0.46	0.003 0.29	0.033 0.96	0.007 0.00	0.031 0.00
TTM × Callable	**-0.134**	**0.129**	**-0.025**	**0.044**	**-0.110**	**0.157**	**-0.043**	**0.157**
	0.011 0.00	0.029 0.00	0.009 0.00	0.021 0.04	0.007 0.00	0.044 0.00	0.015 0.00	0.043 0.00
Callable (Dummy)	**1.265**	**-2.882**	**-2.111**	**-1.859**	**0.615**	**-4.595**	**-6.832**	**-3.542**
	0.250 0.00	0.284 0.00	0.173 0.00	0.199 0.00	0.157 0.00	0.466 0.00	0.284 0.00	0.431 0.00
Bond Volume (-1)	**0.186**	**0.142**	**0.175**	**0.201**	**0.184**	**0.185**	**0.092**	**0.086**
	0.008 0.00	0.023 0.00	0.007 0.00	0.016 0.00	0.006 0.00	0.026 0.00	0.006 0.00	0.005 0.00
Industrial Sector (Dummy)	**0.425**	**-0.255**	**0.607**	**-0.258**	**0.300**	**-1.184**	**-1.091**	**-1.379**
	0.147 0.00	0.261 0.33	0.125 0.00	0.178 0.15	0.082 0.00	0.357 0.00	0.172 0.00	0.331 0.00
Financial Sector (Dummy)	**0.648**	**-0.156**	**0.437**	**-0.639**	**0.575**	**-1.113**	**-1.081**	**-1.821**
	0.160 0.00	0.355 0.66	0.136 0.00	0.245 0.01	0.083 0.00	0.495 0.02	0.169 0.00	0.398 0.00
Constant	**-5.771**	**-2.994**	**-5.350**	**-3.319**	**-7.625**	**-13.389**	**-33.048**	**-23.482**
	0.247 0.00	0.452 0.00	0.203 0.00	0.305 0.00	0.136 0.00	0.657 0.00	0.272 0.00	0.631 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**3877**	**669**	**6095**	**1919**	**9423**	**1290**	**25810**	**4885**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 35

Results from Logit Regressions (with Stock Returns Squared)

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val
Amount Outstanding	**4.108** 0.074 0.00	**2.761** 0.133 0.00	**3.167** 0.047 0.00	**1.752** 0.069 0.00	**4.034** 0.046 0.00	**2.536** 0.072 0.00	**4.786** 0.027 0.00	**1.992** 0.041 0.00
Age of Bond	**-0.065** 0.003 0.00	**-0.059** 0.007 0.00	**-0.081** 0.002 0.00	**-0.130** 0.005 0.00	**-0.028** 0.001 0.00	**-0.046** 0.003 0.00	**-0.011** 0.001 0.00	**-0.112** 0.003 0.00
Abs(Bond Return)	**-0.062** 0.011 0.00	**-0.009** 0.007 0.21			**-0.055** 0.007 0.00	**-0.013** 0.004 0.00		
AGVT=Abs(10yr Treasury Return)	**-0.016** 0.012 0.18	**-0.017** 0.023 0.46	**-0.037** 0.007 0.00	**-0.034** 0.016 0.03	**-0.013** 0.007 0.06	**-0.053** 0.014 0.00	**-0.029** 0.004 0.00	**-0.022** 0.008 0.01
AGVT × Dummy(TTM>6 yrs)	**0.120** 0.012 0.00	**0.074** 0.024 0.00	**0.073** 0.008 0.00	**0.104** 0.016 0.00	**0.122** 0.007 0.00	**0.120** 0.014 0.00	**0.101** 0.004 0.00	**0.102** 0.009 0.00
Abs(S&P500 Return)	**-0.041** 0.004 0.00	**-0.037** 0.009 0.00	**-0.027** 0.003 0.00	**-0.029** 0.005 0.00	**-0.036** 0.003 0.00	**-0.043** 0.005 0.00	**-0.032** 0.001 0.00	**-0.033** 0.003 0.00
Traded Equity (Dummy)					**0.134** 0.012 0.00	**0.201** 0.023 0.00	**0.508** 0.008 0.00	**0.277** 0.015 0.00
Stock Return Squared	**0.000** 0.000 0.59	**-0.000** 0.000 0.40	**0.000** 0.000 0.02	**-0.000** 0.000 0.19				
Stock Return Squared (-1)	**-0.000** 0.000 0.42	**-0.000** 0.000 0.72	**-0.000** 0.000 0.58	**-0.000** 0.000 0.18				
Stock Return Squared(-2)	**0.000** 0.000 0.10	**-0.000** 0.000 0.00	**0.000** 0.000 0.00	**-0.000** 0.000 0.00				
Stock Return Squared (-3)	**-0.000** 0.000 0.94	**-0.000** 0.000 0.00	**-0.000** 0.000 0.48	**-0.000** 0.000 0.00				
Stock Volume	**0.008** 0.002 0.00	**0.008** 0.002 0.00	**0.007** 0.001 0.00	**0.006** 0.001 0.00				
Stock Volume (-1)	**-0.001** 0.002 0.65	**-0.002** 0.002 0.39	**-0.003** 0.002 0.04	**-0.002** 0.001 0.07				
Stock Volume (-2)	**0.001** 0.002 0.57	**-0.004** 0.003 0.10	**0.001** 0.002 0.73	**-0.001** 0.001 0.46				
Stock Volume (-3)	**0.001** 0.002 0.74	**0.001** 0.002 0.56	**0.000** 0.001 0.81	**-0.002** 0.001 0.14				
Credit Risk (by S&P Rating)	**-0.004** 0.004 0.35	**-0.003** 0.003 0.43	**-0.033** 0.003 0.00	**-0.013** 0.003 0.00	**0.013** 0.002 0.00	**-0.012** 0.002 0.00	**0.008** 0.002 0.00	**-0.034** 0.001 0.00
Time-to-Maturity (TTM)	**-0.011** 0.001 0.00	**-0.008** 0.005 0.08	**-0.011** 0.001 0.00	**0.000** 0.004 0.99	**-0.009** 0.001 0.00	**-0.005** 0.003 0.12	**-0.005** 0.000 0.00	**0.016** 0.002 0.00
TTM × Callable	**-0.018** 0.002 0.00	**0.028** 0.008 0.00	**0.002** 0.002 0.11	**0.002** 0.006 0.78	**-0.015** 0.001 0.00	**0.021** 0.004 0.00	**-0.002** 0.001 0.04	**0.010** 0.003 0.00
Callable (Dummy)	**0.104** 0.051 0.04	**-0.638** 0.074 0.00	**-0.538** 0.031 0.00	**-0.349** 0.054 0.00	**-0.015** 0.029 0.62	**-0.518** 0.042 0.00	**-0.482** 0.018 0.00	**-0.168** 0.028 0.00
Bond Volume (-1)	**0.033** 0.002 0.00	**0.049** 0.006 0.00	**0.032** 0.001 0.00	**0.064** 0.005 0.00	**0.034** 0.001 0.00	**0.013** 0.003 0.00	**0.006** 0.000 0.00	**0.006** 0.001 0.00
Industrial Sector (Dummy)	**0.109** 0.029 0.00	**-0.046** 0.068 0.50	**0.152** 0.023 0.00	**-0.029** 0.048 0.55	**0.025** 0.015 0.10	**-0.129** 0.032 0.00	**-0.133** 0.011 0.00	**-0.074** 0.022 0.00
Financial Sector (Dummy)	**0.285** 0.032 0.00	**0.054** 0.093 0.56	**0.216** 0.025 0.00	**-0.180** 0.067 0.01	**0.138** 0.015 0.00	**-0.133** 0.045 0.00	**-0.075** 0.010 0.00	**-0.160** 0.027 0.00
Constant	**-1.064** 0.050 0.00	**-0.842** 0.118 0.00	**-0.749** 0.037 0.00	**-0.772** 0.083 0.00	**-1.322** 0.025 0.00	**-0.834** 0.060 0.00	**-1.888** 0.017 0.00	**-1.084** 0.042 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**6446**	**1065**	**11941**	**2790**	**17550**	**2611**	**61094**	**9968**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 36

Relative Sensitivity of Trading Volume to Each Variable (with Stock Returns Squared)

Effect of one-standard-deviation change in each explanatory variable on the expected trading volume of a bond in each sample. The dependent variable, y =trading volume, is standardized to represent the percentage of par amount outstanding traded per month. All numbers in the table represent the change in expected trading volume due to a one standard deviation change in each explanatory variable. All numbers are multiplied by 100 to represent percentages. The last row in the table gives the expected trading volume given the average values of the explanatory variables, i.e. the "base expected value".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.572	0.246	0.454	0.129	0.552	0.606	0.920	0.253
Age of Bond	-0.408	-0.153	-0.435	-0.197	-0.263	-0.235	-0.142	-0.457
Abs(Bond Return)	-0.466	-0.029			-0.304	-0.044		
AGVT=Abs(10yr Treasury Return)	0.200	-0.017	-0.066	-0.036	0.103	-0.123	-0.049	-0.038
AGVT × Dummy(TTM>6 yrs)	0.304	0.059	0.086	0.065	0.226	0.190	0.143	0.138
Abs(S&P500 Return)	-0.189	-0.065	-0.133	-0.055	-0.150	-0.208	-0.279	-0.195
Traded Equity (Dummy)					0.038	0.093	0.212	0.096
Stock Return Squared	0.017	-0.006	0.010	0.004				
Stock Return Squared (-1)	-0.007	0.000	-0.007	-0.002				
Stock Return Squared (-2)	0.011	-0.024	0.014	-0.014				
Stock Return Squared (-3)	0.001	-0.021	-0.004	-0.013				
Stock Volume	0.061	0.075	0.082	0.036				
Stock Volume (-1)	0.013	-0.024	-0.051	-0.021				
Stock Volume (-2)	0.007	-0.046	0.012	-0.004				
Stock Volume (-3)	0.015	0.014	0.003	-0.013				
Credit Risk (by S&P Rating)	0.249	-0.028	-0.005	-0.109	0.304	-0.297	0.249	-0.641
Time-to-Maturity (TTM)	0.016	-0.076	-0.096	-0.016	0.011	-0.003	-0.036	0.229
TTM × Callable	-0.129	0.170	-0.023	0.046	-0.126	0.172	-0.023	0.088
Callable (Dummy)	0.067	-0.380	-0.116	-0.208	0.044	-0.529	-0.241	-0.237
Bond Volume (-1)	0.078	0.023	0.060	0.019	0.062	0.025	0.022	0.010
Industrial Sector (Dummy)	0.078	-0.047	0.104	-0.037	0.030	-0.156	-0.058	-0.108
Financial Sector (Dummy)	0.058	-0.003	0.033	-0.009	0.050	-0.020	-0.072	-0.043
Base Case Expected Value	**1.782**	**0.900**	**1.697**	**0.625**	**1.641**	**1.925**	**2.521**	**1.723**

TABLE 37

Relative Sensitivity of Probability of Trading to Each Variable (with Stock Returns Squared)

Effect of one-standard-deviation change in each explanatory variable on the probability of a bond to trade. The dependent variable: $y = 1$ if the bond trades and $y = 0$ otherwise. Therefore, $E[y] = Prob(Trade)$. The last row in the table gives the probability of trade given the average value of the explanatory variables, i.e. the "base trading probability".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.198	0.104	0.152	0.053	0.170	0.091	0.108	0.039
Age of Bond	-0.059	-0.036	-0.073	-0.059	-0.032	-0.029	-0.007	-0.041
Abs(Bond Return)	-0.019	-0.003			-0.015	-0.004		
AGVT=Abs(10yr Treasury Return)	-0.006	-0.005	-0.012	-0.008	-0.004	-0.015	-0.006	-0.004
AGVT × Dummy(TTM>6 yrs)	0.029	0.015	0.015	0.016	0.025	0.024	0.012	0.011
Abs(S&P500 Return)	-0.031	-0.022	-0.022	-0.016	-0.025	-0.025	-0.018	-0.014
Traded Equity (Dummy)					0.011	0.013	0.018	0.009
Stock Return Squared	0.000	-0.001	0.001	-0.001				
Stock Return Squared (-1)	-0.001	-0.001	-0.000	-0.001				
Stock Return Squared (-2)	0.002	-0.005	0.002	-0.003				
Stock Return Squared (-3)	-0.000	-0.006	-0.000	-0.003				
Stock Volume	0.012	0.017	0.012	0.012				
Stock Volume (-1)	-0.002	-0.004	-0.006	-0.005				
Stock Volume (-2)	0.002	-0.009	0.001	-0.002				
Stock Volume (-3)	0.001	0.003	0.001	-0.004				
Credit Risk (by S&P Rating)	-0.006	-0.008	-0.043	-0.029	0.017	-0.035	0.007	-0.060
Time-to-Maturity (TTM)	-0.031	-0.013	-0.029	0.000	-0.022	-0.007	-0.006	0.014
TTM × Callable	-0.014	0.030	0.002	0.001	-0.014	0.022	-0.001	0.006
Callable (Dummy)	0.004	-0.076	-0.024	-0.037	-0.001	-0.059	-0.016	-0.011
Bond Volume (-1)	0.010	0.007	0.009	0.005	0.009	0.002	0.001	0.001
Industrial Sector (Dummy)	0.015	-0.007	0.021	-0.004	0.002	-0.017	-0.007	-0.006
Financial Sector (Dummy)	0.019	0.001	0.013	-0.002	0.009	-0.002	-0.005	-0.004
Base Case Expected Value	**0.357**	**0.254**	**0.318**	**0.186**	**0.310**	**0.234**	**0.184**	**0.138**

TABLE 38

Results from Tobit Regressions (with Stock Returns)

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**	**Coef**
	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val	SE P-val
Amount Outstanding	**8.587**	**5.620**	**7.419**	**3.816**	**10.212**	**16.399**	**40.387**	**13.206**
	0.285 0.00	0.471 0.00	0.202 0.00	0.227 0.00	0.203 0.00	0.741 0.00	0.349 0.00	0.475 0.00
Age of Bond	**-0.356**	**-0.206**	**-0.398**	**-0.371**	**-0.189**	**-0.365**	**-0.207**	**-1.197**
	0.015 0.00	0.022 0.00	0.012 0.00	0.016 0.00	0.007 0.00	0.032 0.00	0.015 0.00	0.036 0.00
Abs(Bond Return)	**-1.294**	**-0.105**			**-0.955**	**-0.135**		
	0.056 0.00	0.027 0.00			0.036 0.00	0.039 0.00		
AGVT=Abs(10yr Treasury Return)	**0.401**	**-0.039**	**-0.152**	**-0.115**	**0.234**	**-0.426**	**-0.207**	**-0.207**
	0.060 0.00	0.087 0.65	0.041 0.00	0.057 0.04	0.038 0.00	0.153 0.01	0.062 0.00	0.123 0.09
AGVT × Dummy(TTM>6 yrs)	**0.920**	**0.238**	**0.318**	**0.365**	**0.836**	**0.927**	**1.148**	**1.254**
	0.059 0.00	0.089 0.01	0.043 0.00	0.060 0.00	0.038 0.00	0.153 0.00	0.069 0.00	0.131 0.00
Abs(S&P500 Return)	**-0.194**	**-0.103**	**-0.124**	**-0.089**	**-0.172**	**-0.357**	**-0.472**	**-0.427**
	0.021 0.00	0.035 0.00	0.015 0.00	0.019 0.00	0.014 0.00	0.059 0.00	0.024 0.00	0.043 0.00
Traded Equity (Dummy)					**0.379**	**1.457**	**5.766**	**2.940**
					0.064 0.00	0.249 0.00	0.141 0.00	0.241 0.00
Stock Return	**0.017**	**0.007**	**0.018**	**0.011**				
	0.006 0.01	0.005 0.22	0.004 0.00	0.003 0.00				
Stock Return (-1)	**0.013**	**0.004**	**0.006**	**0.010**				
	0.006 0.04	0.005 0.51	0.004 0.10	0.003 0.00				
Stock Return (-2)	**-0.007**	**-0.016**	**0.007**	**-0.005**				
	0.006 0.27	0.005 0.00	0.004 0.07	0.003 0.10				
Stock Return (-3)	**-0.024**	**-0.009**	**-0.013**	**-0.004**				
	0.006 0.00	0.005 0.08	0.004 0.00	0.003 0.19				
Stock Volume	**0.035**	**0.026**	**0.047**	**0.015**				
	0.010 0.00	0.008 0.00	0.008 0.00	0.004 0.00				
Stock Volume (-1)	**-0.001**	**-0.010**	**-0.030**	**-0.012**				
	0.011 0.93	0.009 0.27	0.009 0.00	0.005 0.01				
Stock Volume (-2)	**0.008**	**-0.023**	**0.010**	**-0.004**				
	0.012 0.50	0.009 0.01	0.009 0.28	0.004 0.32				
Stock Volume (-3)	**0.008**	**0.004**	**-0.002**	**-0.005**				
	0.010 0.45	0.008 0.68	0.008 0.83	0.004 0.26				
Credit Risk (by S&P Rating)	**0.126**	**-0.010**	**0.001**	**-0.045**	**0.180**	**-0.104**	**0.259**	**-0.337**
	0.021 0.00	0.013 0.42	0.018 0.96	0.009 0.00	0.013 0.00	0.022 0.00	0.028 0.00	0.021 0.00
Time-to-Maturity (TTM)	**0.004**	**-0.039**	**-0.029**	**-0.011**	**0.004**	**-0.002**	**-0.024**	**0.246**
	0.005 0.35	0.019 0.04	0.004 0.00	0.016 0.52	0.003 0.29	0.033 0.96	0.007 0.00	0.031 0.00
TTM × Callable	**-0.134**	**0.129**	**-0.026**	**0.045**	**-0.110**	**0.157**	**-0.043**	**0.157**
	0.011 0.00	0.029 0.00	0.009 0.00	0.021 0.03	0.007 0.00	0.044 0.00	0.015 0.00	0.043 0.00
Callable (Dummy)	**1.252**	**-2.954**	**-2.108**	**-1.898**	**0.615**	**-4.595**	**-6.832**	**-3.542**
	0.250 0.00	0.283 0.00	0.173 0.00	0.199 0.00	0.157 0.00	0.466 0.00	0.284 0.00	0.431 0.00
Bond Volume (-1)	**0.185**	**0.143**	**0.174**	**0.201**	**0.184**	**0.185**	**0.092**	**0.086**
	0.008 0.00	0.023 0.00	0.007 0.00	0.016 0.00	0.006 0.00	0.026 0.00	0.006 0.00	0.005 0.00
Industrial Sector (Dummy)	**0.438**	**-0.285**	**0.623**	**-0.258**	**0.300**	**-1.184**	**-1.091**	**-1.379**
	0.147 0.00	0.261 0.27	0.125 0.00	0.179 0.15	0.082 0.00	0.357 0.00	0.172 0.00	0.331 0.00
Financial Sector (Dummy)	**0.662**	**-0.111**	**0.438**	**-0.607**	**0.575**	**-1.113**	**-1.081**	**-1.821**
	0.161 0.00	0.355 0.75	0.136 0.00	0.245 0.01	0.083 0.00	0.495 0.02	0.169 0.00	0.398 0.00
Constant	**-5.747**	**-2.987**	**-5.423**	**-3.407**	**-7.625**	**-13.389**	**-33.048**	**-23.482**
	0.248 0.00	0.452 0.00	0.204 0.00	0.306 0.00	0.136 0.00	0.657 0.00	0.272 0.00	0.631 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**3895**	**659**	**6117**	**1912**	**9423**	**1290**	**25810**	**4885**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 39

Results from Logit Regressions (with Stock Returns)

The dependent variable is *trading volume*, i.e. the percentage of par value outstanding of an issue traded in a given month.

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
	Coef SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val	**Coef** SE P-val
Amount Outstanding	**4.103** 0.075 0.00	**2.811** 0.133 0.00	**3.167** 0.047 0.00	**1.756** 0.069 0.00	**4.034** 0.046 0.00	**2.536** 0.072 0.00	**4.786** 0.027 0.00	**1.992** 0.041 0.00
Age of Bond	**-0.065** 0.003 0.00	**-0.057** 0.007 0.00	**-0.082** 0.002 0.00	**-0.127** 0.005 0.00	**-0.028** 0.001 0.00	**-0.046** 0.003 0.00	**-0.011** 0.001 0.00	**-0.112** 0.003 0.00
Abs(Bond Return)	**-0.064** 0.011 0.00	**-0.019** 0.007 0.01			**-0.055** 0.007 0.00	**-0.013** 0.004 0.00		
AGVT=Abs(10yr Treasury Return)	**-0.018** 0.012 0.13	**-0.013** 0.023 0.59	**-0.036** 0.007 0.00	**-0.028** 0.016 0.08	**-0.013** 0.007 0.06	**-0.053** 0.014 0.00	**-0.029** 0.004 0.00	**-0.022** 0.008 0.01
AGVT × Dummy(TTM>6 yrs)	**0.121** 0.012 0.00	**0.073** 0.024 0.00	**0.073** 0.008 0.00	**0.105** 0.016 0.00	**0.122** 0.007 0.00	**0.120** 0.014 0.00	**0.101** 0.004 0.00	**0.102** 0.009 0.00
Abs(S&P500 Return)	**-0.042** 0.004 0.00	**-0.041** 0.009 0.00	**-0.025** 0.003 0.00	**-0.032** 0.005 0.00	**-0.036** 0.003 0.00	**-0.043** 0.005 0.00	**-0.032** 0.001 0.00	**-0.033** 0.003 0.00
Traded Equity (Dummy)					**0.134** 0.012 0.00	**0.201** 0.023 0.00	**0.508** 0.008 0.00	**0.277** 0.015 0.00
Stock Return	**0.003** 0.001 0.01	**0.002** 0.001 0.11	**0.003** 0.001 0.00	**0.003** 0.001 0.00				
Stock Return (-1)	**0.004** 0.001 0.00	**-0.000** 0.001 0.78	**0.001** 0.001 0.05	**0.003** 0.001 0.00				
Stock Return (-2)	**-0.000** 0.001 0.94	**-0.004** 0.001 0.01	**0.001** 0.001 0.06	**-0.001** 0.001 0.26				
Stock Return (-3)	**-0.002** 0.001 0.06	**-0.005** 0.001 0.00	**-0.001** 0.001 0.24	**-0.002** 0.001 0.05				
Stock Volume	**0.008** 0.002 0.00	**0.007** 0.002 0.00	**0.009** 0.001 0.00	**0.005** 0.001 0.00				
Stock Volume (-1)	**-0.002** 0.002 0.38	**-0.002** 0.002 0.39	**-0.004** 0.002 0.01	**-0.003** 0.001 0.02				
Stock Volume (-2)	**0.002** 0.002 0.30	**-0.005** 0.002 0.03	**0.001** 0.002 0.36	**-0.002** 0.001 0.18				
Stock Volume (-3)	**0.001** 0.002 0.76	**0.001** 0.002 0.75	**-0.001** 0.001 0.72	**-0.002** 0.001 0.19				
Credit Risk (by S&P Rating)	**-0.004** 0.004 0.38	**-0.004** 0.003 0.27	**-0.032** 0.003 0.00	**-0.014** 0.003 0.00	**0.013** 0.002 0.00	**-0.012** 0.002 0.00	**0.008** 0.002 0.00	**-0.034** 0.001 0.00
Time-to-Maturity (TTM)	**-0.011** 0.001 0.00	**-0.007** 0.005 0.16	**-0.011** 0.001 0.00	**0.001** 0.004 0.85	**-0.009** 0.001 0.00	**-0.005** 0.003 0.12	**-0.005** 0.000 0.00	**0.016** 0.002 0.00
TTM × Callable	**-0.018** 0.002 0.00	**0.028** 0.008 0.00	**0.002** 0.002 0.13	**0.002** 0.006 0.72	**-0.015** 0.001 0.00	**0.021** 0.004 0.00	**-0.002** 0.001 0.04	**0.010** 0.003 0.00
Callable (Dummy)	**0.104** 0.051 0.04	**-0.656** 0.073 0.00	**-0.537** 0.031 0.00	**-0.362** 0.054 0.00	**-0.015** 0.029 0.62	**-0.518** 0.042 0.00	**-0.482** 0.018 0.00	**-0.168** 0.028 0.00
Bond Volume (-1)	**0.033** 0.002 0.00	**0.049** 0.006 0.00	**0.032** 0.001 0.00	**0.064** 0.005 0.00	**0.034** 0.001 0.00	**0.013** 0.003 0.00	**0.006** 0.000 0.00	**0.006** 0.001 0.00
Industrial Sector (Dummy)	**0.109** 0.029 0.00	**-0.059** 0.068 0.39	**0.156** 0.023 0.00	**-0.032** 0.048 0.51	**0.025** 0.015 0.10	**-0.129** 0.032 0.00	**-0.133** 0.011 0.00	**-0.074** 0.022 0.00
Financial Sector (Dummy)	**0.278** 0.032 0.00	**0.065** 0.093 0.48	**0.216** 0.025 0.00	**-0.165** 0.067 0.01	**0.138** 0.015 0.00	**-0.133** 0.045 0.00	**-0.075** 0.010 0.00	**-0.160** 0.027 0.00
Constant	**-1.065** 0.050 0.00	**-0.831** 0.118 0.00	**-0.770** 0.037 0.00	**-0.791** 0.083 0.00	**-1.322** 0.025 0.00	**-0.834** 0.060 0.00	**-1.888** 0.017 0.00	**-1.084** 0.042 0.00
Observations	**67261**	**16633**	**121964**	**43000**	**186416**	**49465**	**550073**	**169117**
Censored Observations	42683	12184	81355	34104	126121	37283	436741	142263
Likelihood Ratio Test=$2(L_u - L_r)$	**6462**	**1057**	**11954**	**2776**	**17550**	**2611**	**61094**	**9968**
P-Value of L-Ratio Test	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

TABLE 40

Relative Sensitivity of Trading Volume to Each Variable (with Stock Returns)

Effect of one-standard-deviation change in each explanatory variable on the expected trading volume of a bond in each sample. The dependent variable, y =trading volume, is standardized to represent the percentage of par amount outstanding traded per month. All numbers in the table represent the change in expected trading volume due to a one standard deviation change in each explanatory variable. All numbers are multiplied by 100 to represent percentages. The last row in the table gives the expected trading volume given the average values of the explanatory variables, i.e. the "base expected value".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.573	0.254	0.454	0.129	0.552	0.606	0.920	0.253
Age of Bond	-0.408	-0.149	-0.435	-0.195	-0.263	-0.235	-0.142	-0.457
Abs(Bond Return)	-0.470	-0.040			-0.304	-0.044		
AGVT=Abs(10yr Treasury Return)	0.201	-0.014	-0.062	-0.030	0.103	-0.123	-0.049	-0.038
AGVT × Dummy(TTM>6 yrs)	0.306	0.060	0.085	0.066	0.226	0.190	0.143	0.138
Abs(S&P500 Return)	-0.190	-0.075	-0.128	-0.057	-0.150	-0.208	-0.279	-0.195
Traded Equity (Dummy)					0.038	0.093	0.212	0.096
Stock Return	0.011	0.003	0.008	0.003				
Stock Return (-1)	0.009	0.002	0.003	0.002				
Stock Return (-2)	-0.005	-0.007	0.003	-0.001				
Stock Return (-3)	-0.016	-0.004	-0.006	-0.001				
Stock Volume	0.076	0.069	0.101	0.034				
Stock Volume (-1)	-0.002	-0.024	-0.063	-0.027				
Stock Volume (-2)	0.017	-0.056	0.020	-0.010				
Stock Volume (-3)	0.016	0.009	-0.004	-0.011				
Credit Risk (by S&P Rating)	0.252	-0.038	0.002	-0.114	0.304	-0.297	0.249	-0.641
Time-to-Maturity (TTM)	0.016	-0.069	-0.095	-0.014	0.011	-0.003	-0.036	0.229
TTM × Callable	-0.129	0.172	-0.023	0.048	-0.126	0.172	-0.023	0.088
Callable (Dummy)	0.066	-0.388	-0.116	-0.212	0.044	-0.529	-0.241	-0.237
Bond Volume (-1)	0.078	0.023	0.060	0.019	0.062	0.025	0.022	0.010
Industrial Sector (Dummy)	0.081	-0.053	0.107	-0.037	0.030	-0.156	-0.058	-0.108
Financial Sector (Dummy)	0.060	-0.002	0.033	-0.008	0.050	-0.020	-0.072	-0.043
Base Case Expected Value	**1.781**	**0.902**	**1.696**	**0.626**	**1.641**	**1.925**	**2.521**	**1.723**

TABLE 41

Relative Sensitivity of Probability of Trading to Each Variable (with Stock Returns)

Effect of one-standard-deviation change in each explanatory variable on the probability of a bond to trade. The dependent variable: $y = 1$ if the bond trades and $y = 0$ otherwise. Therefore, $E[y] = Prob(Trade)$. The last row in the table gives the probability of trade given the average value of the explanatory variables, i.e. the "base trading probability".

Regression	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield	Inv.Gr	High-Yield
Amount Outstanding	0.198	0.107	0.152	0.053	0.170	0.091	0.108	0.039
Age of Bond	-0.059	-0.035	-0.073	-0.058	-0.032	-0.029	-0.007	-0.041
Abs(Bond Return)	-0.019	-0.006			-0.015	-0.004		
AGVT=Abs(10yr Treasury Return)	-0.007	-0.004	-0.012	-0.006	-0.004	-0.015	-0.006	-0.004
AGVT × Dummy(TTM>6 yrs)	0.029	0.015	0.015	0.017	0.025	0.024	0.012	0.011
Abs(S&P500 Return)	-0.031	-0.025	-0.021	-0.018	-0.025	-0.025	-0.018	-0.014
Traded Equity (Dummy)					0.011	0.013	0.018	0.009
Stock Return	0.002	0.001	0.001	0.001				
Stock Return (-1)	0.002	-0.000	0.000	0.001				
Stock Return (-2)	-0.000	-0.001	0.000	-0.000				
Stock Return (-3)	-0.001	-0.002	-0.000	-0.000				
Stock Volume	0.013	0.015	0.015	0.010				
Stock Volume (-1)	-0.003	-0.004	-0.007	-0.006				
Stock Volume (-2)	0.004	-0.011	0.002	-0.003				
Stock Volume (-3)	0.001	0.001	-0.001	-0.003				
Credit Risk (by S&P Rating)	-0.005	-0.011	-0.042	-0.031	0.017	-0.035	0.007	-0.060
Time-to-Maturity (TTM)	-0.031	-0.010	-0.029	0.001	-0.022	-0.007	-0.006	0.014
TTM × Callable	-0.014	0.030	0.002	0.002	-0.014	0.022	-0.001	0.006
Callable (Dummy)	0.004	-0.078	-0.023	-0.038	-0.001	-0.059	-0.016	-0.011
Bond Volume (-1)	0.010	0.007	0.009	0.005	0.009	0.002	0.001	0.001
Industrial Sector (Dummy)	0.015	-0.009	0.021	-0.004	0.002	-0.017	-0.007	-0.006
Financial Sector (Dummy)	0.019	0.001	0.013	-0.002	0.009	-0.002	-0.005	-0.004
Base Case Expected Value	**0.357**	**0.254**	**0.318**	**0.186**	**0.310**	**0.234**	**0.184**	**0.138**