Emerging from Bankruptcy with When-Issued Trading[♣]

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Abstract

We examine the set of firms that emerged from Chapter 11 bankruptcy and traded on a when-issued basis prior to their official return to the regular way in NASDAQ, Amex, or NYSE. We find that this when-issued market is liquid and price efficient. The when-issued closing price is a good indicator of the first closing price in the regular way market. Emerging firms that have when-issued trading experience lower regular way volatility and smaller relative spreads than those without when-issued trading. Our probit regressions show that firm size is an important determinant of the adoption of when-issued trading.

1. Introduction

Recent lawsuits related to when-issued (WI) trading of firms emerging from bankruptcy have raised concerns about the informativeness of stock prices in this WI market. For example, the New York Business Wire on March 16, 2004 reported that "the settlement of when-issued trades in NTL Inc. common stock had been thrown into turmoil in early January 2003 when NTL emerged from bankruptcy under a plan of reorganization providing for the issuance of one-fourth the number of shares as was previously contemplated." In this case, Maxcor Financial Inc. and other participants in the WI market expected WI trades would be adjusted to match the new reorganization plan. If so, WI prices should effectively reflect a 1-for-4 reverse stock split. In another lawsuit example (MC Asset Recovery, LLC v. The Southern Company), the defendant, on settlement claims to debt holders, issued stocks as repayment. The stock was issued on Jan. 3 during the WI trading period, but the Southern Company valued the stocks at the price once trading resumed on the New York Stock Exchange (NYSE) on Jan. 11, eight days after issuing the stock. The debt holders valued the stock on the issue date of Jan. 3 with the WI price. The two prices produced a $750 million difference in the settlement between the two parties. The issue before the court was whether WI prices accurately reflected the value of the stock at issue. If so, the debt holders were due an additional $750 million.

The legal issues surrounding these types of cases can vary substantially but the fundamental issue centers on using the WI markets to value equity securities in the settlement. The major question is this: is the when-issued market an efficient and liquid market? If institutional traders are attracted to and actively participate in the WI market,

the courts and traders can rely on this fact and be confident that the securities are trading at a reliable price. Additionally, traders want to know if the reliability of information flow in WI trading reduces asymmetric information and provides an accurate forecast of the prices in the regular way trading. Although current studies have provided empirical evidence on various WI markets, the implications and evidence from the WI market for bankrupt firms is not a focus of current research.

The term "when-issued" is an abbreviated term for "when and if issued".[1] It is a forward contract where settlement of the transaction takes place outside the normal settlement time. WI markets are common for Treasury bonds and stock splits for firms trading on the NYSE (e.g., Nyborg and Sundaresan, 1996; Brooks and Chiou, 1995). They also may appear when a firm spins off a business segment and for an IPO in Europe (e.g., Ezzell, Miles and Mulherin, 2003; Cornelli, Goldreich and Ljungqvist, 2006). To our knowledge, this study provides the first empirical evidence on the WI markets for firms emerging from bankruptcy.[2] Eberhart, Altman, and Aggarwal (1999) identify 28 firms out of 131 firms emerging from bankruptcy between 1980 and 1993 that have WI trading. However, their focus is on the equity performance during the first 200 days after emergence, not the WI market.

The WI market for a bankrupt firm has some of the same "when and if issued" features of other WI markets but differs in a number of ways. First of all, the WI market for stock splits and corporate spinoffs trade concurrently with the regular-way trading

[1] Although it is on a "when and if issued" basis, we are not aware of any cases where when-issued financial assets were not issued.

[2] Although the when-issued market for bankrupt firms has not been studied, the cost of bankruptcy and the performance of bankrupt firms have been examined. Please see Bris, Welch, and Zhu (2006), Denis and Rodgers (2007), and Kalay, Singhal, and Tashjian (2007), for example.

while the WI trading for a bankrupt firm occurs before the regular-way trading. In this regard, the WI market for a bankrupt firm is closer to the market for Treasury securities and European IPO firms. Second, firms emerging from bankruptcy differ from IPO firms and spun off subsidiaries in that they have gone through the reorganization process after filing for bankruptcy protection. Third, emerging firms often cancel their old stocks and distribute an entirely new issue of common stock while IPO firms issue their shares to the market for the first time. However, in general, firms emerging from bankruptcy are associated with high uncertainty, a feature similar to IPO firms. Given this high uncertainty, an interesting question arises; is the information revealed through the WI market prior to the regular-way trading informative? We contribute to current studies by studying the liquidity and informativeness of the WI market for bankrupt firms.

In the WI market for firms emerging from Chapter 11, shares are traded on a WI basis prior to trading in the regular way (RW) on the NYSE, Amex, or the NASDAQ. The WI trading ceases once the RW trading begins. When trading moves to the RW does the stock experience a change in price, such as the price premium a firm experiences when moving from the NASDAQ to the NYSE (Kadlec and McConnell, 1994)? The key issue is whether the WI market is liquid and informative and captures information in price prior to the RW trading.

During our study period from 1993 to 2007, more than 1,600 firms filed Chapter 11 bankruptcy in hopes of reorganizing and avoiding Chapter 7 bankruptcy, the cessation of the business. By September 2007 when we obtained the data, only 13% (216 firms) of these firms successfully emerged from Chapter 11. Additionally, only 64 firms resumed trading on a major exchange. Of these 64 firms, only 24 traded when-issued on the Over-

the-Counter Bulletin Board (OTCBB), Amex, or NYSE prior to returning to the RW trading. This small sample limits some of the investigation but is consistent with other initial studies of WI markets that use relatively small samples. For example, Ezzell, Miles and Mulherin (2003) study a sample of 23 firms in the spin-off WI market. The recent financial crisis is likely to increase the number of firms trading when-issued prior to emerging from bankruptcy if we wait for another five or ten years. However, the timely reporting of our results based on the current firms provides investors, corporations, and exchanges evidence of what to expect in the WI market when future firms emerge from bankruptcy.

We find that the WI trading is liquid and efficient. There is no statistically significant premium or discount from the WI price to the RW price. The WI closing price is a good indicator of the closing price in the RW market at the end of the first trading day. The volatility and trading activity of the WI market is not significantly different from those of the RW market. We also observe significant presence of informed or institutional traders in the WI market, which may have contributed to the price discovery and information flow in the market.

Emerging firms that have WI trading experience lower RW volatility and smaller relative bid-ask spreads than those without WI trading, suggesting that WI trading mitigates asymmetric information and reduces uncertainty in the RW market. Although WI trading seems beneficial to emerging firms, unfortunately, it is still somewhat infrequently adopted as only 24 of 64 firms trade when-issued prior to re-emerging on the

NASDAQ, Amex, or NYSE.[3] Our probit regressions show that size (measured by total assets or market capitalization) is an important determinant of the adoption of WI trading.

2. WI trading process and related literature

The WI trading for firms emerging from Chapter 11 bankruptcy takes place at the OTCBB, Amex, or NYSE. When a firm is emerging from Chapter 11, the firm re-applies for listing on the NYSE, Amex, or NASDAQ. Between the receipt of the application and the announced date the firm will return for RW trading, the shares of the emerging firm may trade when-issued. If the NYSE or Amex believes that volume will be sufficient between the receipt of the application and the restart date for trading, a WI market will be authorized. The ticker symbol for a WI emerging firm will be its ticker symbol with a WI extension. For example, if a firm with ticker symbol ZZZ is returning to the NYSE, the WI trading will be under the symbol ZZZ.WI.

For the OTCBB, market makers pay $6 for the right to quote bids and asks on a stock emerging from bankruptcy prior to the reinstatement on NASDAQ, Amex, or NYSE. The OTCBB WI market can be for any emerging firm but it does not compete with the NYSE if the exchange initiates WI trading. A WI market forms if and only if market makers decide to pay the $6 fee and then provide quotes on the emerging company. Market maker quotes are published through the OTCBB like other stocks on OTCBB. It only requires one market maker for the shares to remain on the OTCBB. The WI shares are removed if no market makers are active. In order to distinguish WI trading,

[3] In terms of percentage with when-issued trading, this represents 38% of emerging firms during our study period. In comparison, the percentage is only 21% during 1980-1993 as reported in Eberhart, Altman, and Aggarwal (1999). The percentage, although small, has increased over time.

the ticker symbols have the letter V added to the end of the four letter ticker. Once the company comes out of bankruptcy and is re-listed, trading in the WI market ceases.

WI markets, by design, trade ahead of or concurrently with the RW markets. The trading of WI securities provides a way for information to be reflected in prices. The largest and most active WI market is in Treasuries, where the soon-to-be auctioned Treasury asset is traded prior to the actual auction. Nyborg and Sundaresan (1996), who studied the Treasury WI market, find that WI trading appears to reduce uncertainty of the auction and the winner's curse. The WI market is informative about the auction price.

NYSE allows investors to trade corporate securities issued in conjunction with a stock-split before new shares are distributed to existing shareholders. The new shares created as a result of a stock split are traded on a WI basis. The law of one price in finance implies that two equivalent financial claims should be selling at the same price in a competitive financial market. Since one pre-split share entitles the holder to the same cash flow stream as a proportional number of WI after-split shares, the price in the RW should be equal to the price of the WI shares adjusted for the split factor.

Choi and Strong (1983) find that WI shares adjusted for the split-size sell at a higher closing price than the RW shares. Lamoureux and Wansley (1989) show that some of the premium is due to a mismatch between market purchases and market sales. Brooks and Chiou (1995) reexamine this price premium with intraday data and find that bid-ask clustering and timing of the trades explain the observed WI premium documented with end-of-day prices. In a related study, Nayar and Rozeff (2001) find a negative return around record dates of splits and show that the record date decline is associated with both the WI premium and the ex-date return. Angel, Brooks and Mathew (2004) use WI

trading to explain the post split volatility jump. They show that both WI and RW markets have reduced volatility during the dual trading period, so the post-split volatility jump is a return to the normal volatility level.

Ezzell, Miles, and Mulherin (2003) study the WI trading of NYSE-listed publicly-traded subsidiaries and their parent firms around the time the subsidiaries are fully spun off to the public. They find that the WI shares of the subsidiary firm trade at a discount to their RW shares, contrary to WI premium of stock splits. They show that the price differential between the WI and RW shares can be explained by exchange location, bid-ask clustering, and the asymmetric movements in bid and ask quotes.

A number of countries in Europe permit WI trading before an IPO. Germany has a very active WI market (also known as the grey market) for IPO shares. Aussenegg, Pichler, and Stomper (2006) study IPO pricing in Germany and find that the WI trading reveals relevant information for setting IPO offer prices. Retail investors and smaller institutions are the major participants in the WI market. Cornelli, Goldreich, and Ljungqvist (2006) use prices from the WI market to examine whether irrational behavior among small investors drives post-IPO prices. They find that high WI market prices are a very good indicator of first-day aftermarket prices while low WI market prices are not. Dorn (2009) finds that retail investors consistently overpay IPOs in the WI market relative to the immediate aftermarket.

WI trading in the U.S. equity IPO market is prohibited. The Securities Act of 1933 under section 12(d) prohibits the sale of securities in a WI market, whether over-the-counter or on an exchange prior to effective registration (Loss and Vernon, 1945). In 1941 the SEC issued a special rule for WI trading pursuant to emerging from bankruptcy

once the plan of reorganization was confirmed by a court (Section 77 of the Bankruptcy Act). More recently the ban on trading securities of unregistered shares was again confirmed by the SEC (see paragraph II.F of the Securities Act Release No. 38067 (12/20/1996) Regulation M). The effective date of the ruling was March 4, 1997 and the stated reason was that the short sales could result in lower offering prices, thus reducing an issuer's proceeds. However, this logic is in conflict with results from the European WI markets that indicate a reduction in IPO underpricing. WI trading could be used prior to the IPO auction to mitigate asymmetric information and reduce underpricing.

Current studies have provided empirical evidence on various WI markets, but the WI market for firms emerging from bankruptcy has not been studied. We contribute to the research by providing the first empirical evidence on the informativeness of the WI market for firms emerging from bankruptcy.

3. Data and methodology

3.1 Data sources

We obtain the list of bankruptcy firms from the BankruptcyData.com, a division of the New Generation Research. Our study period runs from January 1993, when the Trade and Quote (TAQ) data became available, to September 2007 when we collected the data. Since we focus on WI trading after emerging from bankruptcy, we include in our sample only firms that filed Chapter 11 bankruptcy during our study period and emerged as public firms trading on NYSE, Amex, or NASDAQ. BankruptcyData.com provides details about outcomes, court documents, company background, news, and reorganization plans on each bankrupt firm, but information on whether a firm has WI trading is not

always available. We search the Lexis-Nexis database, Dow Jones News, as well as other financial news sites, and SEC filings to verify whether an emerging firm has WI trading.

We obtain the WI trading data from Bloomberg and the RW trading data from the CRSP and TAQ databases. For firms whose WI trading occurred on the Amex or NYSE, WI trading data also are available from the TAQ database. We obtain data on the financial statements from Compustat.

3.2 Data description

Table 1 provides the annual breakdown of Chapter 11 bankruptcy firms. Panel A reports the number of firms by year when Chapter 11 was filed. We only look at bankrupt firms that emerged from bankruptcy before September 2007. A total of 1,621 publicly traded firms filed Chapter 11 bankruptcy during the period January 1993-September 2007. The number of bankrupt firms reached a yearly high of 259 in 2001 and gradually dropped to 45 in 2006 with 35 in the first three quarters of 2007. Of the 1,621 bankrupt firms, only 216 (13.3%) emerged from the bankruptcy as public companies. The remaining bankrupt firms were liquidated, bought out, emerged as private companies, or are still under Chapter 11 bankruptcy as of September 2007. For the 259 bankrupt firms in 2001, only 23 (less than 9%) of them emerged by September 2007. However, 22 (about 28%) of the 78 bankrupt firms in 2005 emerged as public companies.

[Insert Table 1 here]

Of the 216 emerging firms, 64 (29.6%) firms resume trading on major exchanges, with six on Amex, 26 on NYSE, and 32 on NASDAQ. The majority of the emerging firms (152) trade on the OTCBB or the Pink Sheets. We focus on these 64 firms in this study and find that 24 (37.5%) firms have WI trading. Panel B reports the number of

emerging firms by year of emergence. Only four of the 12 firms emerged during 1993 to 1999 were traded on a WI basis. However, seven of the 12 firms emerged in 2003 have WI trading. Furthermore, six of the ten firms that emerged in 2006 and all three firms that emerged in 2007 have WI trading, which may indicate a growing use of WI trading for emerging firms.

We provide a list of the 24 emerging firms that have WI trading in Appendix A. The list covers firms in several different industries such as communications, technology, energy, and airline. Three major U.S. airlines are included on the list. United Airlines emerged in 2006, while Delta and Northwest appeared in 2007. Trans World Airlines, operating as a subsidiary of American Airlines, emerged in 1995. The bankruptcy date is the date when the Chapter 11 was filed. The emerged confirmation date is the date when the reorganization plan was confirmed while the emerged effective date is the date when the plan became effective. With one exception, the WI trading occurs after the emerged confirmation date. The emerged confirmation date for Loral Space & Communications was Aug. 1, 2005, but the WI trading started on July 27, 2005. The RW trading usually starts on or after the effective date of the reorganization plan, with Adelphia Communication being the only exception. Its RW started on Jan. 10, 2007, but Adelphia's reorganization plan did not become effective until Feb. 13, 2007.

Of the 24 emerging firms, ten trade on the NASDAQ, two trade on the Amex, and 12 trade on the NYSE after emergence. We do not see any particular pattern from the pre-petition exchanges to the post-bankruptcy exchanges. Five firms traded on the OTC before their bankruptcy petition, but their post-bankruptcy exchanges include both the NYSE and NASDAQ. Although eight firms traded on the NYSE both before and after

bankruptcy, three firms switched from NASDAQ to NYSE and six firms switched from NYSE to NASDAQ when they emerged from bankruptcy. Interestingly, the two firms that traded on the Amex before bankruptcy, stayed with the Amex after emergence.

3.3 Methodology

The objective of our study is to examine whether the WI trading is liquid and informative. We use two measures of trading activity – trading volume and turnover – to explore the WI market's liquidity. Trading volume is the number of shares traded on a given day while turnover is the trading volume divided by the number of outstanding shares. We compare the trading activity of the WI market to that of the RW trading. The trading activity may be intensified on the first day of the RW trading, similar to the IPO phenomenon. However, the trading volume and turnover should return to a normal level. If the WI market is considered liquid and active, we expect its trading activity to be comparable to the normal level observed during the RW trading.

To determine whether the WI trading is informative about the value of the firm, we calculate the returns from the last closing price of the WI market to the first opening price on the RW trading and from the last closing price of the WI market to the first closing price on the RW trading. Those returns are adjusted for market returns to net market impact. If the WI trading is informative, we expect to see zero or low returns. In other words, the WI price is a good indicator of the price of the shares when they trade the RW.

If the WI trading is dominated by institutional investors and thus has less noise trading, we expect to observe lower volatility on the WI market than on the RW trading. Economists generally identify two types of volatility: fundamental and transitory. Fundamental volatility reflects uncertainty about underlying security values, whereas

transitory volatility is caused by the trading process. Harris (1998) defines transitory volatility as the tendency of prices to bounce around their fundamental values. If there is less noise trading in the WI market, transitory volatility is expected to be lower. However, if the WI market is dominated by noise traders, its volatility could be higher than the RW volatility.

If the WI trading is informative about the value of the firm, the fundamental volatility on the RW trading is expected to be lower for firms that have WI trading than those that do not. We form a control sample that includes firms that emerged from bankruptcy but whose shares did not trade on a WI basis and compare the volatility between the WI sample and the control sample.

It has been established that the use of daily high and low prices captures transitory volatility better than the use of daily closing prices (e.g., Garman and Klass, 1980; Parkinson, 1980). Grossman (1988) also points out that a close-to-close return is a market direction measure, not a volatility measure. To make a daily comparison between our WI sample and our control sample, we adopt the Grossman and the Parkinson measures. Volatility measures based on Grossman (1988) can be calculated as follows:

$$Volatility_T\ (VG_T) = \ell n\left(\frac{HP_T}{LP_T}\right). \tag{1}$$

Alternatively, the volatility measure of Parkinson (1980) can be expressed as follows:

$$Volatility_T\ (VP_T) = \frac{(HP_T - LP_T)^2}{4\ell n2}, \tag{2}$$

where HP_T is the high price and LP_T is the low price on day T, and ℓn is the natural log transformation.

According to Easley and O'Hara (1987) and Stoll (1989), when liquidity providers perceive an increase in the degree of information asymmetry, they tend to widen the bid–ask spread to compensate for the expected losses to informed traders. If the WI market enhances information dissemination and revelation before the RW trading, the degree of information asymmetry for firms with WI trading is expected to be lower than that for firms without WI trading. We calculate the bid-ask spread and the relative spread as follows.

$$\textit{Bid-ask Spread} = P_a - P_b \,, \tag{3}$$

$$\textit{Relative Spread} = \frac{P_a - P_b}{\frac{(P_a + P_b)}{2}} \,, \tag{4}$$

where P_a is the ask price and P_b is the bid price.

4. Empirical results

4.1 WI firms

Table 2 reports the summary statistics of 20 WI firms. Although there are 24 firms in our initial sample, we are able to collect WI trading data for only 20 firms.[4] The median (mean) number of WI trading days is seven (29.3), with a minimum of only two days and maximum of 284 days.[5] Our sample covers firm with various sizes. The median (mean) total assets is $4.2 ($8.9) billion. Small cap, mid cap, and large cap companies all are included because market cap ranges from $12 million to $39.8 billion, with a median

[4] When-issued trading data for Conseco, Harnischfeger Industries, NTL, and SpectraSite are not available.

[5] We also remove the outlier that has 284 WI trading days and run all analyses. Results are qualitatively the same, so we only report the results with all 20 WI firms in our sample. Results without the outlier are available on request.

of $1.4 billion. The median (mean) first RW closing price is $25.07 (24.78), ranging from $1.50 to $60.70. The median (mean) return from WI close to RW open is 0.90% (1.35%), but the median (mean) return from WI close to RW close is 0.07% (1.21%), insignificantly different from zero. In terms of percentage, 65% (25%) of the firms show positive (zero) WI close to RW open return while only 50% (5%) exhibit positive (zero) WI close to RW Close return.

Because market returns may affect firm returns, we also calculate market adjusted returns by subtracting the S&P 500 index returns from firm returns. The median (mean) market adjusted return from WI close to RW open is 0.70% (1.27%), but the median (mean) market adjusted return from WI close to RW close is -0.05% (1.04%), which is basically zero, statistically. In terms of percentage, 65% (30%) of the firms show positive (negative) market adjusted WI close to RW open return while 50% (50%) exhibit positive (negative) market adjusted WI close to RW Close return.

Our result suggests that the WI trading is informative about the RW trading price. Initially, there is a price jump from the WI close to the RW open. This is probably due to the high concentration of buy orders once the stock returns to trading in the RW. However, by the end of the first trading day, the closing price is consistent with the WI closing price from the previous day. This result is different from the WI discount found in spinoffs. Our result suggests that the WI closing price is a good indicator of the first RW closing price, consistent with the findings from Treasuries and European IPOs.

[Insert Table 2 here]

When it comes to trading activity, on average, the WI turnover and volume are less than the RW turnover and volume, but the difference is not statistically significant. When

we exclude the trading volume and turnover on the first trading day, the average RW trading volume and turnover are smaller and closer to the WI trading volume and turnover. On average there are 567,940 WI shares traded per day, with the maximum being 3,573,680 shares. According to Chordia, Roll, and Subrahmanyam (2001), the average trading volume of NYSE firms during the period 1988-1998 was only 183,480 shares, where our sample started. Although the average daily trading volume has increased over time, it was about 755,660 shares in 2007 (NYSE Fact Book), where our sample ended. If we use that as our benchmark, we believe the WI market is a relatively active and liquid market.

The WI volatility is slightly higher than the RW volatility, but the difference is not statistically significant. As discussed earlier, we use the day high and day low prices to capture the transitory volatility.[6] If there is less noise trading in the WI market, transitory volatility is expected to be lower. However, if the WI market is dominated by noise traders, its volatility could be higher than the RW volatility. Since we observe insignificant difference in volatilities, the degree of participation by noise traders in both WI and RW markets does not seem to differ substantially. We estimate trades by noise traders and institutional (informed) traders in Section 4.2.

We also perform sensitivity analysis to see if our trading activity and volatility measures are sensitive to the time periods we select. For RW turnover, volume, and volatility, we calculate and report four measures based on different time periods. Measure 1 is the daily average during days 1-30, measure 2 is the daily average during days 2-30,

[6] We only report volatility results based on equation (1). Results based on equation (2) are qualitatively the same and are available on request.

measure 3 is the daily average during days 4-33, and measure 4 is the daily average during days 6-35. Overall, our results are not sensitive to the time periods we select.

4.2 WI trade size

Since our results show that the WI market is liquid and informative, we believe that sophisticated and informed traders are present in this market. To understand the composition of market participants in the WI market, we follow Bhattacharya (2001) and use both trade-size-based and dollar-value-based proxies to distinguish between sophisticated and naïve traders. The rationale is that wealthier and better informed investors are likely to make larger trades than are less wealthy and less informed investors (e.g., Easley and O'Hara, 1987; Hasbrouck, 1991).

Although there are 20 WI firms in our sample, the TAQ data are available for only five firms. Since it is difficult to draw a meaningful inference based on only five firms, we focus on presenting only what we observe from these firms. We find that informed or sophisticated traders are active in the WI market. For trade-size-based proxy, three firms have more trades from large traders than from small traders. For example, Morrison Knudsen has 123 (61.19%) trades initiated by large traders but only 11 (5.47%) trades by small traders. Across all five firms, 22.88% (29.73%) of total trades are small (large) trades, suggesting that sophisticated and informed traders outpace naïve and uninformed traders. Furthermore, large trades represent 81.21% of total shares traded whereas small trades account for only 1.71%. Results from the dollar-value-based proxy are not as obvious as those from the trade-size-based proxy. Only two firms have more trades from large traders than from small traders. Nevertheless, large trades account for 69.37% of

total shares traded while small trades account for only 6.12%. Results from these five firms suggest that sophisticated and informed traders are present in the WI market.

4.3 The first RW trading day of WI firms

On the first RW trading day, trading activity and volatility are expected to increase as shares are issued and formally traded on exchanges. We report summary statistics in Panel A of Table 3. The median (mean) open-to-close return is -0.64% (-0.10%), which is insignificantly different from 0 based on *t*-test (Wilcoxon sign-rank test). As expected, trading volume, turnover, and volatility are higher than those reported in Table 2. The median (mean) bid-ask spread is $0.10 (0.17) and the median (mean) relative spread is 0.39% (1.93%). The median (mean) WI close to RW close return 0.07% (1.21%) reported in Table 2 is smaller than the median (mean) relative spread. In other words, even if the WI to RW price premium was significant, it is not large enough to cover the bid-ask spread.

[Insert Table 3 here]

To understand what explains the cross sectional variation in volatility on the first RW trading day, we provide correlation coefficients in Panel B of Table 3.[7] Surprisingly, volatility is not significantly correlated with turnover or relative spread. The correlation between volatility and open-to-close return is positive and significant at the 10% level. The closing price is positively correlated with WI close to RW open return and is negatively correlated with relative spread. Overall, we do not find any particular pattern of the behavior of WI firms on the first RW trading day. Our comparison between the WI

[7] We also run regressions of volatility on those variables with various model specifications, but none of the regressions are significant.

sample and the control sample in the next section provides more insight into behavior on the first RW trading day as well as during the first 30 trading days.

4.4 WI firms vs. control firms

To select our control group, we examine the 40 firms that emerged from the Chapter 11 bankruptcy as public firms but did not have WI trading. To be comparable to our WI firms, firms in the control group should only have new shares issued after emerging from bankruptcy. Thus, the five firms that have their shares traded throughout the whole bankruptcy period are excluded.[8] We also exclude 15 firms whose trading data are not available and therefore have a total of 20 firms in our control group.

[Insert Table 4 here]

Table 4 reports the means and medians of several variables for the WI and the control firms. We use the *t*-test and Wilcoxon signed-rank test to determine the level of significance for the mean and median comparison between WI firms and the control group. Panel A shows that the mean and median prices of the WI firms are significantly higher than those of the control group. Turnover is not significantly different between the two sets of firms. Volatility of the control group is significantly higher than that of the WI firms, and is consistent with the notion that WI trading helps dampen volatility on the first RW trading day. Bid-ask spread of the control group is wider than that of the WI firms, but the difference is not significant. However, the median relative spread of the

[8] We do not find anything unique associated with those five firms as their firm characteristics are comparable to those of when-issued firms. The median (mean) total assets, market cap, long-term debt, and the first closing price after emergence are $3,376 ($9,118) million, $597 ($3,803) million, $954 ($2,188) million, and $22.67 ($28.11), respectively. It is not unusual for bankrupt firms to have their shares traded throughout the Chapter 11 period. For example, 76 of the 131 emerging firms in Eberhart, Altman, and Aggarwal (1999) traded throughout the bankruptcy period.

control group is significantly wider than that of the WI firms.[9] To the extent that relative spread measures the degree of asymmetric information, this result is consistent with the notion that the WI trading mitigates asymmetric information for emerging firms.

Panel B of Table 4 reports means and medians of firm characteristics and RW turnover and volatility for both groups. On average, WI firms are larger, in terms of total assets and market cap, and have more debt than control firms. Given the selection criteria set by the NYSE, it is not surprising to see that WI firms are larger; however, the larger amount of long-term debt is not that apparent. The book to marker (BTM), debt to equity (D/E), and debt to capital (D/C) of the WI firms are higher than those of the control group, but the differences are not significant. That is, emerging firms that have WI trading prior to the RW trading have similar capital structure and BTM as emerging firms that do not have WI trading. Although the turnover (volatility) of the WI firms is higher (less) than that of the control group, the difference is not significant.

To understand what explains the cross sectional variation in RW volatility, we run several model specifications of the following OLS regression models.

$$RW\ Volatility\ 1 = \alpha_0 + \alpha_1 WI + \alpha_2 Market\ Return + \alpha_3 Price + \alpha_4 Turnover\ 1 + \alpha_5 Size + \alpha_6 BTM + \alpha_7 D/E + \varepsilon\ , \quad (5)$$

$$RW\ Volatility\ 2 = \beta_0 + \beta_1 WI + \beta_2 Market\ Return + \beta_3 Price + \beta_4 Turnover\ 2 + \beta_5 Size + \beta_6 BTM + \beta_7 D/E + \epsilon\ , \quad (6)$$

where *RW volatility 1 (volatility 2)* is the average RW volatility during the first 30 trading days (excluding the first day); *WI* is a dummy variable taking the value of one if the

[9] It should be noted that since moving to decimal trading, spreads and average trade sizes have changed substantially. Ideally, for our comparison between WI firms and control firms, we should control for this shift. However, this is difficult given our small sample size. We appreciate a referee for pointing this out.

emerging firm has WI trading and zero otherwise; *Market Return* is the corresponding average daily S&P 500 index return; *Price* is the first closing price on the RW trading; *Turnover 1 (Turnover 2)* is the average trading volume during the first 30 days (excluding the first day) scaled by the number of outstanding shares; *Size* is the log of market cap; *BTM* is the book-to-market ratio; and *D/E* is the debt-to-equity ratio.

[Insert Table 5 here]

Results in Table 5 show that RW volatility is positively related to RW turnover and negatively related to Market Return and Price. Size, BTM, and D/E do not seem to affect the RW volatility. The coefficient of WI variable is significantly negative, indicating that WI firms tend to have lower RW volatility than emerging firms that do not have WI trading. Although the results in Table 4 show that the difference in RW volatility between the WI sample and the control group is not significant, our OLS regressions show that once we control for other variables, the WI variable still has significant impact on RW volatility. The WI trading not only dampens the volatility on the first RW trading day but also continues to have impact on volatility during the first 30 trading days.

4.5 Determinants of WI trading

To determine what types of firms are more likely to have WI trading prior to the RW trading, we look at the correlation coefficients and utilize a probit regression model. Panel A of Table 6 reports the Pearson correlation coefficients for all 40 emerging bankrupt firms. WI is positively correlated with TA (the log of total assets reported on the first post-reorganization 10-K) and Price (the first RW closing price), indicating that larger firms and stocks that have higher prices are associated with WI trading. TA is positively correlated with Price and negatively correlated with Volatility. BTM is

negatively correlated with D/E and Price, but positively correlated with Volatility. For emerging bankrupt firms, growth (low BTM) firms seem to rely more on debt financing. Lastly, Price is negatively correlated with Volatility while Volatility is positively correlated with Turnover.

[Insert Table 6 here]

In our probit model, the dependant variable is the dummy variable WI. The independent variables include some firm characteristics. We do not include Price because it is highly correlated with TA. We include BTM as a standard control variable. D/E seems important for emerging firms as it shows the new capital structure. Although Turnover is an ex-post variable, we include it as an ex-ante estimate of trading activity. Our probit model is in the following form.

$$WI = \theta_0 + \theta_1 TA + \theta_2 BTM + \theta_3 D/E + \theta_4 (Turnover\ 1\ or\ Turnover\ 2) + \delta, \quad (7)$$

Panel B of Table 6 reports the estimates and their standard errors for five probit regressions. In line with the positive correlation between WI and TA reported in Panel A, the estimates of TA in all five probit regressions are positive and significant. The larger the total assets of a bankrupt firm, the higher the probability that the firm has WI trading prior to the RW trading. Although not reported, we also use the log of market cap to replace TA in the probit regressions. Results are similar, but the coefficient is significant only at the 5% level. The BTM and D/E do not seem to impact the adoption of WI trading as the estimates of these two variables are not significant. Coefficients of Turnover 1 and Turnover 2 are both positive but they are not significant.

Overall, our results from the probit regressions show that firm size (measured by total assets or market cap) is an important determinant of the adoption of WI trading.

According to the NYSE rule, WI trading will be authorized if the expected trading volume is sufficiently large. Since trading volume needs to be forecasted to determine if WI trading should commence, firm size can be used as an indicator of expected trading volume. This concept is not new in the finance studies. For instance, Karpoff (1986) suggests that the expected trading volume increases proportionally with the number of shares outstanding, which is positively related to firm size. Recently, Anderson and Dyl (2007) include both the number of shares outstanding and share prices in their model of trading volume.

5. Conclusion

Although issues related to the WI markets and questions about the Chapter 11 bankruptcy have been studied in the research, the WI market for firms emerging from bankruptcy remains a market with unanswered questions regarding liquidity, efficient prices, and information flow. Furthermore, recent lawsuits related to WI trading of firms emerging from bankruptcy have raised concerns about the informativeness of stock prices in this WI market. Investors and the courts need to know if the WI prices accurately reflect the value of the stock prior to the effective emergence date.

The WI market is liquid and informative about the stock prices on the RW trading. In other words, the WI price is a reliable indicator of the closing price on the first trading day of the RW trading. We also find that emerging firms that have WI trading experience lower RW volatility and relative spreads than those without WI trading. WI trading helps dampen the RW volatility and mitigate asymmetric information. We also find evidence of the presence of sophisticated and informed traders in the WI market. Finally, our probit

regressions show that firm size is an important determinant of which firms are selected by market makers and the NYSE for WI trading. We conclude that the prices in the WI market, in general, are good for settling claims with debt holders when shares are issued in payment of their claim.

Appendix A
List of When-issued Emerging Firms

The following table lists companies that emerged from Chapter 11 and traded on a "when-issued" basis before their regular-way trading. The bankruptcy date is the date when the Chapter 11 was filed. The emerged confirmation date is the date when the reorganization plan was confirmed while the emerged effective date is the date when the plan became effective. Pre-petition Exchange is the exchange where the firm's shares were listed before filing for bankruptcy. ♣ indicates that when-issued data are not available.

Company Name	Bankruptcy Date	Emerged Confirmation Date	Emerged Effective Date	First When-issued Trading Day	First Regular-way Trading Day	Post-bankruptcy Exchange	Pre-petition Exchange
Atlas Air Worldwide Holdings, Inc.	01/30/04	07/16/04	07/27/04	07/22/04	07/27/04	NASDAQ	OTC
Adelphia Communication Corp.	06/25/02	01/05/07	02/13/07	01/05/07	01/10/07	NYSE	NASDAQ
Armstrong World Industries, Inc.	12/06/00	08/15/06	10/04/06	10/11/06	10/18/06	NYSE	NYSE
Bradlees, Inc.	06/23/95	11/18/98	12/01/98	02/03/99	03/05/99	NASDAQ	NYSE
Conseco, Inc.♣	12/18/02	09/09/03	09/10/03	N/A	09/11/03	NYSE	OTC
Cornerstone Natural Gas, Inc.	06/04/93	10/13/93	11/03/93	11/04/93	12/08/93	AMEX	AMEX
Delta Air Lines, Inc.	09/14/05	04/25/07	04/30/07	04/26/07	05/03/07	NYSE	NYSE
Exide Technologies, Inc.	04/14/02	04/21/04	05/04/04	04/21/04	05/06/04	NASDAQ	OTC
GenTek, Inc.	10/11/02	10/07/03	11/10/03	11/03/03	11/19/03	NASDAQ	OTC
Global Crossing, Ltd.	01/28/02	12/26/02	12/09/03	12/12/03	01/22/04	NASDAQ	NYSE
Harnischfeger Industries, Inc.♣	06/07/99	05/22/01	07/13/01	07/14/01	08/01/01	NASDAQ	NYSE
Loral Space & Communications Ltd.	07/15/03	08/01/05	11/22/05	07/27/05	12/08/05	NASDAQ	NYSE
Mirant Corporation	07/14/03	12/09/05	01/03/06	12/02/05	01/11/06	NYSE	NYSE
Morrison Knudsen Corp.	06/25/96	08/26/96	09/11/96	09/12/96	10/01/96	NYSE	NYSE
Northwest Airlines Corporation	09/14/05	05/18/07	05/31/07	05/18/07	05/31/07	NYSE	NASDAQ
NRG Energy, Inc.	05/14/03	11/24/03	12/05/03	12/02/03	12/08/03	NYSE	NYSE
NTL Incorporated♣	05/08/02	09/06/02	01/13/03	N/A	01/13/03	NASDAQ	OTC
Owens Corning	10/05/00	09/28/06	10/31/06	09/21/06	11/01/06	NYSE	NYSE
Petroleum Geo-Services ASA	07/29/03	10/21/03	11/05/03	10/31/03	12/17/04	NYSE	NYSE
Portland General Electric	12/02/01	04/03/06	04/10/06	04/03/06	04/10/06	NYSE	NYSE
SpectraSite Holdings, Inc.♣	11/15/02	01/28/03	02/10/03	N/A	10/03/03	NYSE	NASDAQ
Trans World Airlines, Inc.	06/30/95	08/04/95	08/23/95	08/04/95	09/13/95	AMEX	AMEX
UAL Corporation	12/09/02	01/20/06	02/01/06	01/26/06	02/02/06	NASDAQ	NYSE
Winn-Dixie Stores, Inc.	02/21/05	11/09/06	11/21/06	11/14/06	11/22/06	NASDAQ	NYSE

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Table 1

Annual Distribution of Chapter 11 Firms

This table provides the annual breakdown of Chapter 11 bankruptcy firms. Panel A reports the number of firms by year when Chapter 11 was filed. The cutoff month for bankruptcy emergence is September 2007. Panel B reports the number of emerging firms by year of emergence.

Panel A: number of firms by bankruptcy year

Year Chapter 11 bankruptcy filed	Number of firms filed Chapter 11	Number of firms emerging from bankruptcy as public companies	Number of firms traded on NYSE, Amex, or NASDAQ after emergence	Number of firms traded on a "when issued" basis
1993	69	3	2	1
1994	54	9	0	0
1995	69	9	6	2
1996	64	6	1	1
1997	63	8	2	0
1998	105	6	3	0
1999	146	15	6	1
2000	179	17	2	2
2001	259	23	6	1
2002	211	50	14	8
2003	160	33	12	4
2004	84	12	5	1
2005	78	22	3	3
2006	45	2	2	0
2007	35	1	0	0
Total	1621	216	64	24

Panel B: number of emerging firms on NYSE, Amex, and NASDAQ by year emerged

Year emerged from Chapter 11 bankruptcy	Number of emerging firms	Number of emerging firms with when-issued trading	Number of emerging firms without when-issuing trading
1993	1	1	0
1994	1	0	1
1995	2	1	1
1996	3	1	2
1997	0	0	0
1998	1	1	0
1999	4	0	4
2000	4	0	4
2001	3	1	2
2002	5	0	5
2003	12	7	5
2004	10	2	8
2005	5	1	4
2006	10	6	4
2007	3	3	0
Total	64	24	40

Table 2

Summary Statistics of When-issued Emerging Firms

This table reports the summary statistics of 20 firms emerging from Chapter 11 bankruptcy as public firms and traded on a when-issued (WI) basis before their regular way (RW) trading. Total assets are from the first available post-reorganization 10-K. Market cap is the number of shares outstanding times the first closing price. Adj. close to open return is equal to WI close to RW open return minus S&P 500 index close to open return. Adj. close to close return is equal to WI close to RW close return minus S&P 500 index close to close return. WI (RW) turnover is the average WI (RW) trading volume scaled by the number of outstanding shares multiplied by 1000. WI (RW) volume is the average number of shares traded at the WI (RW) market. Daily volatility is measured by the log of the ratio of day high price to day low price. WI (RW) volatility is the average daily volatility at the WI (RW) market multiplied by 1,000. For RW turnover, volume, and volatility, measure 1 is the daily average during days 1-30, measure 2 is the daily average during days 2-30, measure 3 is the daily average during days 4-33, and measure 4 is the daily average during days 6-35. The *t*-test and Wilcoxon sign-rank test are used to determine the level of significance for mean and median, respectively. RW measures are compared to the respective WI figure while returns are compared to zero.

	Mean	Median	Minimum	Maximum	Std. Dev.
Number of WI trading days	29.3	7	2	284	63
Total assets (in $millions)	8893	4234	46	30185	9546
Market cap (in $millions)	4288	1423	12	39809	8828
First RW closing price	24.78	25.07	1.50	60.70	14.54
WI close to RW open return	1.35%*	0.90%**	-5.56%	6.62%	3.00%
Adj. close to open return	1.27%*	0.70%*	-6.24%	6.53%	3.24%
WI close to RW close return	1.21%	0.07%	-10.28%	25.27%	6.83%
Adj. close to close return	1.04%	-0.05%	-9.37%	24.88%	6.74%
WI turnover	5.72	3.09	0.05	25.14	6.90
RW turnover 1	8.60	7.21	0.43	22.75	6.54
RW turnover 2	8.36	6.94	0.43	22.15	6.49
RW turnover 3	8.05	6.98	0.37	21.76	6.47
RW turnover 4	8.24	6.60	0.36	21.90	6.59
WI volume	567940	154971	3033	3573680	879150
RW volume 1	898247	384522*	11573	4031844	1242409
RW volume 2	875095	369519	11969	3893190	1203615
RW volume 3	826262	347619	11173	3756397	1152703
RW volume 4	812859	358612	10987	3633397	1111591
WI volatility	39.47	31.06	4.24	120.30	32.61
RW volatility 1	31.72	25.70	3.76	79.98	21.69
RW volatility 2	30.92	23.02	3.62	77.09	21.63
RW volatility 3	30.66	22.27	3.26	82.38	21.79
RW volatility 4	31.11	22.71	3.41	85.51	22.59

** and * indicate statistical significance at the 0.05 and 0.10 levels, respectively.

Table 3

First Regular Way Trading of When-issued Emerging Firms

Panel A reports summary statistics on the first regular way (RW) trading day for 20 firms emerging from Chapter 11 bankruptcy as public firms and traded on a "when-issued" (WI) basis before their RW trading on NYSE, Amex, or NASDAQ. Volatility is measured by the log of the ratio of day high price to day low price. Volume is the number of shares traded. Turnover is the trading volume scaled by the number of outstanding shares multiplied by 1,000. Bid-ask spread is the ask price minus the bid price. Relative spread is equal to the bid-ask spread divided by the bid-ask midpoint. Panel B reports the Pearson correlation coefficients. The numbers in parentheses are *p*-values.

Panel A: The first RW trading day

	Mean	Median	Minimum	Maximum
Open to close return	-0.10%	-0.64%	-12.10%	25.27%
Volatility	54.83	34.40	0.00	225.34
Volume	1548401	500000	100	8052800
Turnover	14.08	6.77	0.01	40.17
Bid-ask spread	0.17	0.10	0.01	0.91
Relative spread	1.93%	0.39%	0.04%	16.67%

Panel B: Pearson correlation coefficients

Variables	Volatility	Turnover	Open to close return	WI close to RW open return	Closing price	Relative spread
Volatility	1.0000	0.3086	0.4217*	-0.2510	-0.1511	-0.0372
		(0.1855)	(0.0640)	(0.2858)	(0.5249)	(0.8763)
Turnover		1.0000	-0.0306	0.4152*	0.0622	-0.2917
			(0.8983)	(0.0687)	(0.7947)	(0.2121)
Open to close return			1.0000	-0.2452	-0.3400	0.2490
				(0.2974)	(0.1424)	(0.2897)
WI close to RW open return				1.0000	0.4718**	-0.2807
					(0.0357)	(0.2306)
Closing price					1.0000	-0.5787***
						(0.0075)
Relative spread						1.0000

***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 4

Comparison between When-issued Emerging Firms and Control Firms

This table reports the means and medians of several variables for the when-issued (WI) sample and the Control sample. The WI sample includes 20 firms emerging from the Chapter 11 bankruptcy as public firms and traded on a "when issued" basis before their regular way (RW) trading. The Control sample includes 20 firms emerging from the Chapter 11 bankruptcy as public firms without WI trading. Turnover is the trading volume scaled by the number of outstanding shares multiplied by 1,000. Volatility is measured by the log of the ratio of day high price to day low price. Bid-ask spread is the ask price minus the bid price. Relative spread is equal to the bid-ask spread divided by the bid-ask midpoint. Market cap is the number of shares outstanding times the first closing price. Total assets and L-T D (long-term debt) are from the first available post-reorganization 10-K. BTM is the book-to-market ratio. D/E is the debt-to-equity ratio. D/C is the debt-to-capital ratio, which is equal to total debt divided by the sum of long-term debt and equity. RW turnover 1 is the average RW trading volume during the first 30 trading days scaled by the number of outstanding shares multiplied by 1,000. RW turnover 2 is the average RW trading volume during the first 30 trading days excluding the first day scaled by the number of outstanding shares multiplied by 1000. RW volatility 1 is the average RW volatility during the first 30 trading days multiplied by 1000. RW volatility 2 is the average RW volatility during the first 30 trading days excluding the first day multiplied by 1000. The *t*-test and Wilcoxon signed-rank test are used to determine the level of significance for mean and median, respectively.

Panel A: The first RW trading day

Variables	Mean		Median	
	WI sample	Control sample	WI sample	Control sample
Closing Price	24.78**	17.54	25.07**	16.35
Turnover	14.08	26.69	6.77	6.73
Volatility	54.83*	112.03	34.40*	56.06
Bid-ask spread	0.17	0.22	0.10	0.15
Relative spread	1.93%	1.90%	0.39%*	0.80%

Panel B: Firm characteristics

Variables	Mean		Median	
	WI sample	Control sample	WI sample	Control sample
Market cap (in $millions)	4288***	592	1423***	405
Total assets (in $millions)	8893***	1646	4234***	1124
L-T D (in $millions)	2884**	522	769**	282
BTM	0.99	0.84	1.01	0.80
D/E	1.94	1.79	0.91	0.90
D/C	0.48	0.44	0.48	0.47
RW Turnover 1	8.60	6.36	7.21	3.60
RW Turnover 2	8.36	5.66	6.94	2.88
RW Volatility 1	31.72	40.78	25.70	32.42
RW Volatility 2	30.92	38.32	23.02	29.82

***, ** and * indicate that the figure is significantly different from the comparable matched sample value at the 0.01, 0.05, and 0.10 levels, respectively.

Table 5

OLS Regressions of Regular Way Volatility

This table reports coefficients from the following OLS regressions.

$$RW\ Volatility\ 1 = \alpha_0 + \alpha_1 WI + \alpha_2 Market\ Return + \alpha_3 Price + \alpha_4 Turnover\ 1 + \alpha_5 Size + \alpha_6 BTM + \alpha_7 D/E + \varepsilon$$

$$RW\ Volatility\ 2 = \beta_0 + \beta_1 WI + \beta_2 Market\ Return + \beta_3 Price + \beta_4 Turnover\ 2 + \beta_5 Size + \beta_6 BTM + \beta_7 D/E + \epsilon$$

The significant levels are based on White's heteroskedasticity-consistent x^2 test. RW stands for regular way. RW volatility 1 is the average RW volatility during the first 30 trading days. RW volatility 2 is the average RW volatility during the first 30 trading days excluding the first day. Volatility is defined as the log of the ratio of day high to day low. WI is a dummy variable taking the value of one if the emerging firm has when-issued trading before the RW trading and zero otherwise. Market return is the corresponding average daily S&P 500 index return during the first 30 trading days. Price is the first closing price on the RW trading. Turnover 1 is the average trading volume during the first 30 days scaled by the number of outstanding shares. Turnover 2 is the average trading volume during the first 30 days excluding the first trading day scaled by the number of outstanding shares. Size is the log of market cap. BTM is the book-to-market ratio. D/E is the debt-to-equity ratio. The numbers in parentheses are standard errors of coefficient estimates.

Variables	RW Volatility 1			RW Volatility 2		
	1	2	3	4	5	6
Intercept	0.0295***	0.0094	0.0027	0.0296***	0.0174	0.0094
	(0.0041)	(0.0328)	(0.0329)	(0.0040)	(0.0336)	(0.0333)
WI	-0.0074**	-0.0083*	-0.0078*	-0.0078**	-0.0083*	-0.0079*
	(0.0036)	(0.0043)	(0.0042)	(0.0036)	(0.0042)	(0.0042)
Market return	-0.5174*	-0.5097**	-0.5383**	-0.4375	-0.4321*	-0.4695*
	(0.2625)	(0.2468)	(0.2441)	(0.2606)	(0.2507)	(0.2500)
Price	-0.0003**	-0.0004**	-0.0004**	-0.0003**	-0.0004**	-0.0004**
	(0.0001)	(0.0002)	(0.0002)	(0.0001)	(0.0002)	(0.0002)
Turnover 1	1.4695***	1.4506***	1.3935***			
	(0.2779)	(0.2843)	(0.2974)			
Turnover 2				1.5306***	1.5144***	1.4781***
				(0.3275)	(0.3387)	(0.3658)
Size		0.0010	0.0015		0.0006	0.0011
		(0.0017)	(0.0016)		(0.0018)	(0.0017)
BTM			-0.0020			1.7425
			(0.0025)			(1.0876)
D/E			0.0007			0.1949
			(0.0007)			(0.1510)
Adj. R^2	0.5243	0.5123	0.5287	0.5134	0.4969	0.5290
F-value	9.54***	7.51***	5.97***	9.18***	7.12***	5.97***
Observations	40	40	40	40	40	40

***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Table 6

Determinants of When-Issued Trading

Panel A reports the Pearson correlation coefficients for 40 firms emerging from Chapter 11 bankruptcy as public firms and traded on NYSE, Amex, or NASDAQ. WI is a dummy variable taking the value of one if the emerging firm has when-issued trading before the regular way (RW) trading and zero otherwise. TA is the log of total assets reported on the first post-reorganization 10-K; BTM is the book-to-market ratio; D/E is the debt-to-equity ratio; Price is the first closing price on the RW trading; Volatility 1 is the average daily volatility (log of the ratio of day high price to day low price) during the first 30 trading days; and Turnover 1 (Turnover 2) is the average RW trading volume during the first 30 trading days (excluding the first day) scaled by the number of outstanding shares. Panel B reports the estimates for five probit regressions from the following probit model.

$$WI = \theta_0 + \theta_1 TA + \theta_2 BTM + \theta_3 D/E + \theta_4 (Turnover\ 1\ or\ Turnover\ 2) + \delta$$

The numbers in parentheses are *p*-values in Panel A and standard errors of coefficient estimates in Panel B.

Panel A: Pearson correlation coefficients

Variables	WI	TA	BTM	D/E	Price	Volatility 1	Turnover 1
WI	1.0000	0.4704***	0.1228	0.0272	0.2894*	-0.1747	0.1811
		(0.0022)	(0.4502)	(0.8679)	(0.0701)	(0.2810)	(0.2634)
TA		1.0000	0.0492	0.2366	0.5341***	-0.2858*	0.1601
			(0.7631)	(0.1416)	(0.0004)	(0.0738)	(0.3237)
BTM			1.0000	-0.3649**	-0.3774**	0.3820**	0.0995
				(0.0206)	(0.0164)	(0.0150)	(0.5412)
D/E				1.0000	0.0237	0.0777	0.1091
					(0.8847)	(0.6337)	(0.5028)
Price					1.0000	-0.5560***	-0.1376
						(0.0002)	(0.3973)
Volatility 1						1.0000	0.4524***
							(0.0034)
Turnover 1							1.0000

Panel B: Probit regressions

Variables	1	2	3	4	5
Intercept	-9.1302***	-9.3311***	-9.5377***	-9.4805***	-9.3786***
	(3.3161)	(3.3251)	(3.3967)	(3.4504)	(3.4580)
TA	0.4281***	0.4268***	0.4411***	0.4319***	0.4263***
	(0.1547)	(0.1546)	(0.1610)	(0.1632)	(0.1639)
BTM		0.2501	0.2052	0.1621	0.1409
		(0.3576)	(0.3829)	(0.3827)	(0.3843)
D/E			-0.0319	-0.0404	-0.0400
			(0.0850)	(0.0863)	(0.0868)
Turnover 1				27.5184	
				(36.6217)	
Turnover 2					34.5509
					(37.5891)
Pseudo R^2	0.2817	0.2945	0.2978	0.3118	0.3188
Chi-square	9.4934***	9.9848***	10.1124**	10.6554**	10.9284**
Observations	40	40	40	40	40

***, ** and * indicate statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.