Is Convertible Bond Offering a Backdoor Equity Offering?

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Abstract

We explore the idea that certain convertible bond offerings are basically back-door equity offerings. We examine several methods of detecting equity components in convertible bonds and then test for market reactions to the offering announcements and also long-run post offering performances. By dividing the sample of convertible bond offerings into a debt-like versus equity-like portfolio, we find market reactions follow a hierarchy predicted by the pecking order hypothesis. Consistent with empirical evidence from equity offerings, we find that the buy and hold stock returns of the equity-like portfolio significantly underperforms as compared to that of the debt-like portfolio. Similarly, the operating performance of the equity-like portfolio is worse than that of the debt-like counterpart. In addition, we find that the equity-like portfolio's idiosyncratic risk increase significantly after the offering. Our results suggest that the market participants are able to determine whether the convertible bond offerings are indeed back-door equity offerings.

Keywords: convertible bond offering, hedge ratio, announcement effect, long-run performance.

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1. Introduction

Convertible Bonds (CBs) are hybrid securities with mixed characteristics of straight debts, common equities, as well as options. They share the most similarities with straight debts when they are first issued by companies, and they embody potential characteristics of common equities if they are converted. The most fascinating feature of this type of security is that if the CB ends up with being in-the-money, the investor can exercise the imbedded call warrant to convert the CB into a predetermined amount of equities of the issuer's. If the issuer's stock performs poorly and the CB ends up with being out-of-the-money, then the investors will basically be holding a debt security.[2]

Past empirical studies find that on average the market reacts negatively to companies' CB offering announcements. The announcements of seasoned equity offerings are associated with negative market reactions. Stock price reactions to debt offering are mainly non-positive and statistically insignificant. Based on these results, it appears to us that the magnitude of negative market reaction to CB offerings is in between that of the equity offerings and the straight debt offerings. For example, Mikkelson and Partch (1986) report that at the announcement of CB offerings, the abnormal stock returns are significantly negative (average prediction error = -1.97%, z-value=-4.94), which is lower than the abnormal returns at the common stock offerings (average prediction error = -3.56%, z-value=-9.81) and much higher than that at the straight debt offerings (-0.23 %, z-value=-1.40).

The different announcement effects for different financing instruments can be explained by the pecking order hypothesis (Myers and Majluf, 1984)[3]. Among a variety of instruments for external financing, common equities and straight debts are regarded as the most risky and the least risky ones, respectively. CB which is a hybrid between the two is thought to have a risk level in between that of the

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[2] In a CB contract, many provisions and conditions are stipulated, which allow for more flexibility for both the issuer and the investors, but they complicate the valuation and investigation of CB. For example, in some cases the CB contracts specify call notice period, which require the issuers to announce the dates to call in advance. Some contracts also have call protections and soft call features, the former of which restrict the CB to be non-callable within the period of call protection and the latter of which restrict the CB to be callable only when the underlying stock price maintains above a level for a certain period of time. In some other cases, put options are also provided so that the investors can even choose to return CBs to the issuers at a specific time and price. In general, the opportunity to convert CB into equities benefits the investors by allowing them to share the growth potential of the issuer, whereas in compensation the investors receive a coupon payment lower than that of the regular straight debt.

[3] The hypothesis assumes that managers have information advantages over the public about the firms' assets-in-place and investment opportunities, thereby they decide to offer equities when their outstanding shares are overvalued by the market. Consequently, the offerings of equity or risky securities signal information of overvaluations to the market. Furthermore, the more risky the security is issued, the more negative the information is signaled about the firm, and then the more negatively the market reacts.

straight debt and the common equity. So, differences in the market reactions to the offerings of common equities, CBs, and straight debts as documented in past studies are consistent with the prediction of the pecking order hypothesis.

Since CBs are nonstandard financing instruments whose exact characteristics are contingent on whether they are converted into equities in the future, it makes the empirical analysis of the CB offerings more complicated. Stein (1992) noted that CBs in general can be viewed as backdoor equities, because most companies that offer CBs are hoping to convert them into equities at later dates. Davidson, Glascock and Schwartz (1995) also argued that on average the offering of CBs send an equity-like signal to the market. This raises a question as to whether the market is able to differentiate different types of convertible bonds given their features. [4]

While there are many studies on market reactions to CB offerings, little attention is paid to the issuers' post-offering long-run stock performances and operating performances. Lee and Loughran (1998) examined the long-run performances of CB issuers' stock returns, and they found significant underperformance of all the CB issuers. Since stock prices are reflections of the issuers' operating and thus earning performances, it is likely that the poor performances in stock returns are fundamentally driven by the downturns in the issuers' operating performances. Lee and Loughran (1998) and Lewis, Rogalski and Seward (2001) studied the long-run operating performances of the convertible bond issuers, and they found all the CB issuers underperformed their matching firms in terms of operating incomes in the years subsequent to their CB offerings.[5]

In this paper, we explore the idea that certain CB offerings are basically backdoor equity offerings while the others are more like debt offerings. In order to accomplish this investigation, we use a simple rule such as the CBs' moneyness to more complicated techniques such as conversion probability and hedge ratio, and then we separate the CBs offerings into three portfolios, the equity-like portfolio, the mixed portfolio, and the debt-like portfolio. We focus on the two extremely, the debt-like portfolio and

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[4] Some of the CBs are designed to be more like common equities, while others share more similarities with straight debts. Different measurements of equity components in CBs are put forward, for example, Janjigian (1987), Davidson, Glascock and Schwartz (1995), Burlacu (2000), Loncarski, Horst and Veld (2006), Ammann, Fehr and Seiz (2006), and so forth. The studies into the announcement effects of CB offerings find that the announcement effects differ for CBs with different degrees of equity components. In general it is found that the more equity-like the CB is offered, the more negatively the market reacts, which suggests the validity of the prediction from pecking order hypothesis within the universe of CBs.

[5] According to the predictions of the pecking order theory, companies that offer common equities worth less than what the market perceives. Loughran and Ritter (1995) and Spiess and Affleck-Graves (1995) found that issuers of SEOs underperform the non-issuing matching firms during the five years following the equity offerings.

the equity-like portfolio, and we analyze their differences in the short-run announcement effect and the long-run performances. We find evidence both in the short-run and in the long-run that are consistent with the predictions of the pecking order hypothesis. Our findings suggest that market participants are able to decipher between the "backdoor" equity offerings and the "frontdoor" debt offerings.

This paper contributes to the existing literatures mainly in the following aspects. Firstly, to the best of our knowledge, this is the first study that analyzes the long-run performances of equity-like versus debt-like CB offerings in terms of stock returns, operating performances, and equity risks. Secondly, we test the effectiveness of several techniques that were proposed in past studies to measure the equity components in CBs. Thirdly, we document that the equity-like portfolio experienced the most significant and negative market reaction in the short-run announcement period. In the long-run subsequent to the CB offerings, the equity-like portfolio receive the most significant underperformance in stock returns, the most significant downgrade in the operating performance, and the most significant increase in idiosyncratic risk and total risk.

The rest of this paper is organized as follows. In section 2, we review existing literatures of the CB offerings. In section 3, we summarize and compare several techniques that measure the relative equity-components in different CBs. Section 4 describes the data and sample. In section 5, we report and discuss our findings of the announcement effect and the issuers' long-run stock return performances, operating performances, and changes in equity risks. Section 6 contains the conclusion.

2. Convertible Bond Research and Hypotheses

2.1 Convertible bond offering as a signal

Pilcher (1955), Brigham (1966), Hoffmeister (1977), Stein (1992), Davidson, Glascock and Schwarz (1995) collectively share the view that the ultimate goals of most CB issuers are to raise equities through conversions. By issuing CBs, firms on one hand benefit from the reduction in tax and the agency costs of free cash flow, and on the other hand increase financial distress costs. So, an optimal debt-equity ratio is achieved by balancing the effects so as to maximize the firm's value. Brennan and Schwartz (1988) and Stein (1992) suggest that firms use CBs to signal information about the reduced adverse selection costs associated with pure equity issues.[6] Some believe that firms are able to use CB to mitigate the risk shifting problem (Green, 1984).

[6] Another point of view suggests that CBs can help firms mitigate problems caused by capital market imperfections, such as information costs, risk-shifting problems, managerial discretion, security overpricing, and overinvestment

The sequential financing hypothesis, which is based on the assumption of uncertainties about firms' future investment opportunities, gains lots of agreements in literatures in explaining the function of CBs. Harris and Artur (1985) first modeled and pointed out that CBs can be designed to satisfy firms' sequential financing requirements. Mayers (1998) argue that firms finance their planned multistage investment programs with convertibles, where the call provision plays an essential role in reducing the costs in sequential financing problem. By forcing conversion, firms can retain the funds that they raised previously, and thus reduce costs by accessing the capital market. Chang, Chen and Liu (2004) noted that CBs are cost-effective for firms with promising growth opportunities, because CBs allows the issuers to proceed with their financing plans by forcing conversion when the investment options are valuable. Much evidence is found to be consistent with sequential signaling hypothesis.

Some other theories contend that CB offering may not necessarily signal information, eliminate risk-shifting problems, or reduce overinvestment incentives. Brennan and Schwartz (1988) argue that firms with difficulties in estimating their risks are likely to issue CBs. Lewis, Rogalski and Seward (2001) argued that firms may choose to issue CBs when they have anticipated declines in operating profits which dominate a corresponding reduction in systematic business risks. They further deduce that the reason why firms choose CBs rather than common equities might be because those firms are rationed out of the equity market due to high costs of adverse selection. Since adverse selection costs are higher in larger security offers (Krasker, 1986), firms may not be able to obtain larger amounts of capital from the stock market.[7]

2.2 Market reactions to CB offerings announcements

CB issuers in the US market have long been the most intensely studied objectives in literatures. Many researches reveal that on average the US stock market reacts significantly negative to the announcements of CB offerings. Dann and Mikkelson (1984) reported a -2.31% announcement period average abnormal stock returns, Mikkelson and Partch (1986) reported a -1.97% change in issuers' stock prices, and similar results are also found by Eckbo (1986), Janjigian (1987), Eugene (1992), Davidson, Glascock and Schwartz (1995), Lewis, Rogalski and Seward (2003), etc. The only exception is found by

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in risky projects or negative NPV projects. In addition, firms who issue CBs can restrict the overinvestment incentives of managers (Mayers, 1998).

[7] Korkeamaki and Moore (2004) found that call protections are shorter for firms that experience higher levels of capital investment soon after the offerings and those CBs with weak or no call protection are offered by firms which invest greater amounts soon after offering than those issuing CBs with strong protection. Therefore, Korkeamaki and Moore (2004) concluded that the designs of call provisions are consistent with the firm's need for short-term financing flexibility.

Fields and Mais (1991) when they examined the privately placed CBs. They reported a significantly positive (1.8 %) stock market reaction. But because most CBs are offered to the public, private placements can be assessed separately, which do not affect the general finding of negative market reactions to CB offerings.

Besides the US CB market, Japan, Europe, and Non-Japan Asia regions are the other major CB markets worldwide. Researches on market reactions to CB offerings in markets other than the US market are carried out more recently. For instance, Abhyankar and Dunning (1999) studied the UK market, Burlacu (2000) studied the French market, Dutordoir and Gucht (2004) studied the western European market, Loncarski, Horst and Veld (2006) studied the Canadian market, and Ammann, Fehr and Seiz (2006) studied the Germany and Switzerland market. Those studies report negative market reactions to CB offerings, which are similar to the findings in the US market. However, few exceptions are noticed outside of the US market as well. De Roon and Veld (1995) examined CB offerings in Dutch market and found significantly positive market reactions. Chang, Chen and Liu (2004) explored the Taiwanese-listed firms and found significantly positive abnormal returns. Results found on the Japanese market are inconsistent. Kang and Stulz (1996) showed a significantly positive market reaction to the Japanese CB issuers, and they argued that such phenomenon was due to the unique features of the corporate finance arrangements of Japanese companies. Whereas, the latest research by Cheng, Visaltanachoti and Kesayan (2005) report that the market reactions to CB offerings in the Japanese market are also significantly negative.

2.3 Evidence of Long-run Performances of Convertible Bond Issuers

Previous researches have examined the post offering performances of straight debt issuers, CB issuers, and common stock issuers. Hansen and Crutchley (1990) found that all issuers experienced post offering earning decreases and the decreases for the common stocks issuers were the largest. Bae, Jeong, Sun and Tang (2002) found that prior to the security offerings, the buy-and-hold stock returns of all issuers were higher than the benchmarks[8], and the outperformance of the common stock issuers were found to be significant. After the security offerings, all issuers underperform benchmarks in terms of average buy-and-hold returns, where only the buy-and-hold returns of the median straight debt issuer continued to outperform benchmarks. Bae, Jeong, Sun and Tang (2002) also examined the issuers' operating performances surrounding the securities offerings and found similar outperformances in

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[8] Bae, Jeong, Sun and Tang (2002) chose benchmarks from nonissuers whose market value of equity and book-to-market ratio are the closest to the issuers'.

operating performances prior to the offerings of all three types of securities and post offering downturns in their performances.

In researches that focus on CB offerings, empirical evidence show that during the post-offering years, the CB issuers on average underperform both in terms of stock returns and in terms of operating incomes. Lee and Loughran (1998) found that the average annual return by holding the CB issuers' shares over five years after the CB offerings was 8.6%, compared to 12.5% of that of that of the matching firms' and 14.5% of that of the NYSE/Amex value-weighted index's. On the other hand, they showed that the CB issuers' average annual stock return during years prior to the offerings was 54.2%, compared to 23.2% of that of the value-weighted market index's. Similar findings are documented by Hansen and Crutchley (1990) that stock prices increased prior to the offerings of CBs and decreased since then, Spiess and Affleck-Graves (1999) that the median issuer's five-year holding period return underperformed that of its matched counterpart's by -19.8% (significantly different from zero), Eckbo, Masulis and Norli (2000) that the equal-weighed five-year buy and hold stock return of the NYSE/Amex-listed CB issuers underperform that of their industry and size matchers by -29.5% (p-value=0.012), and Lewis, Rogalski and Seward (2001) that during the five years after CB offerings, issuers underperform the CRSP value-weighted index and their comparison firms by 580 and 530 basis points, respectively, on a per year basis.

Concurrent with the low stock returns subsequent to the CB offerings, the operating performances of the issuers' are also found to be degenerate. Lee and Loughran (1998) and Lewis, Rogalski and Seward (2001) reported that in the four years prior to the CB offerings, the issuers' annual operating performance exceeded that of the comparison firms, while in contrast, in the years following the CB offerings, the issuers' operating performances declined greatly, and the poor performance can only be partly explained by the issuers' industry factors.

2.4 Explanations for Empirical Evidences

Many studies both theoretical and empirical have been carried out trying to interpret the reasons why the stock market reacts negatively to CB offerings and what are the determinants of the post-offering poor performances of the issuers. Basically, these explanations are developed under the assumption of asymmetric information, where corporate managers are assumed to have information advantages over the outside investors about firms' true values and growth prospects.

The agency problem (Jensen and Meckling, 1976) and the problem of free cash flows (Jensen, 1986) are firstly noticed by researchers out of the consideration of asymmetric information. Both theories imply that external financing activities by companies which have severer agency problems are received more negatively by the market. But empirically such prediction is not substantiated, because companies' financial slacks are found to be insignificantly related to the degrees of announcement period market reactions, for example Eugene (1992).

Green (1984), Ambarish, John and Williams (1987), and Eugene (1992) suggest that the market reactions to new financings are associated with the growth opportunities of the issuers'. They argue that upon a new equity offering, a negative stock price response may be observed in the mature firms and a positive stock price response may be expected in the growth firms. Eugene (1992) proxied companies' growth opportunities using dividend policies, and he empirically showed that the announcement period abnormal return for the mature issuers are significantly negative (-1.13), while the reaction to growth issuers are non-negative (0.01, although insignificant), which support this explanation.

Miller and Rock (1985) modeled that market reactions are related to the sizes of the financings, which has an explanation similar to an earlier capital structure decision model of Fama and Miller (1972). Fama and Miller (1972) predicted that unanticipated financing signals information of firms' earnings downturns, and Miller and Rock (1985) predicted that the amount of unexpected outside financings are commensurate with the discrepancies between the actual and the expected earnings cash flows. As a result, the larger the amount of unexpected funding is, the worse the stock market reacts. But such predictions were rejected by empirical tests, such as Eckbo (1986), Mikkelson and Partch (1986), Hansen and Crutchley (1990), and Lee and Loughran (1998), all of which found insignificant relationship between the market reactions and the sizes of the proceeds.

Under the assumption of asymmetric information, Myers and Majluf (1984) modeled and predicted that if managers act in the interests of the existing share holders, they will make decisions to issue new stocks when their outstanding shares are overvalued by the market. By realizing this, the market reacts negatively to the announcements of new equity offerings, and firms follow a pecking order to procure financings, starting with a best choice of internal financings, followed by debt financings, and ending with the last choice of equity financings. The companies' financing decision hence signal information to the market. The degrees of negative market reactions are dependent on different level of risks that the newly offered securities involve. The riskier the security is offered, the more negatively the market will interpret it.

Empirical findings are generally in support of the pecking order hypothesis. Loughran and Ritter (1995) further developed the windows of opportunity hypothesis from a similar starting point, and they predict that firms will issue common stocks when they are overvalued and then those firms will experience lower post offering performances. In addition, it is found that the prediction from pecking order hypothesis is compatible with the growth hypothesis of Green (1984), Ambarish, John and Williams (1987), and Eugene (1992). Eugene (1992) showed that after controlling differences in companies' growth opportunities, the declines in stock prices upon offerings of common equities are significantly greater than the declines upon debt offerings. He thus concluded that the market response to a security offering is a function of the growth opportunities of the issuers and the riskiness the new offering involves.

3. Equity Components of Convertible Bonds

Though all CBs embody hybrid properties of both debts and equities, some CBs are more like common equities by having greater potentials of getting converted into equities, while the other CBs are more resemblant to straight debts by having less conversion opportunities. As a result, a subsampling perspective which allows us to differentiate the heterogeneities among subsample CBs is important. In addition, a thorough examination into subsamples of CBs provides us an overview into the debt-equity capital structure. In the following part, we evaluate and compare several variables which measure the relative equity components in CBs.

3.1.1 Moneyness

CBs are often offered out-of-the-money and become in-the-money by the time of the final maturity or by the time when they are called. The distance between the current stock price (*S*) and the predetermined conversion price (*K*) provides a natural although rough measurement of the relative equity components in CBs. The difference between the conversion price and the current stock price is "*moneyness*", the definitions for which differ among literatures. Bechmann (2001) define "*moneyness*" as the ratio of "*conversion value/ the call payment*", which is the inverse of Beatty and Johnson (1985)'s definition, and both of them measure the potential of forced conversions of callable CBs. Carayannopoulos and Kalimipalli (2003) and Ammann, Kind and Wilde (2003) estimate the degree of "*moneyness*" as the ratio "*CV/SB*", which is the ratio of the *conversion value* to the *equivalent straight bond value* (in terms of maturity, coupon, call features) obtained during the numerical process that derived the value of the CB. Yu (2005) and Zabolotnyuk, Jones and Veld (2007) define "*moneyness*" as the ratio of "*S/K*", the "*current stock price/ the conversion price*", which is the inverse of Kuhlman and Radcliffe (1992)'s definition, measuring the potentials that managers motivate CB holders to convert soon after the offerings. Lower value of "*moneyness*" indicates larger distance between the current stock price and the conversion price, and thus the CB is viewed as more debt-like.

3.1.2 Expected Time to Becoming At-the-money

Unlike *"moneyness"*, which merely contrasts the current stock price with the conversion price, Davidson, Glascock and Schwartz (1995) put forward a measurement of the "*expected time to becoming at-the-money*", which take into consideration the growth rate of the issuer's stock price appreciation. The shorter the expected time to becoming at-the-money is, the more equity-like the CB is. Assume that the CB's underlying stock price follows geometric Brownian motion, $dS_t / S_t = \mu dt + \sigma dW_t$, where the drift parameter μ measures is the expected rate of appreciation of the issuer's stock price and σ is the stock volatility, the expected stock price at a future time t is $E(S_t) = S_0 e^{\mu t}$, where S_0 is the present stock price. The estimated time to becoming at-the-money, denoted as "*Time*", is then derived by estimating μ and setting S_t =*K* and S_0=*S*, where "*K*" and "*S*" are defined as above. Therefore, *Time* = [*ln(K)-ln(S)*]/ μ .

3.1.3 Conversion Probability

Another way of measuring the relative equity component is to estimate the CB's conversion probability, which is roughly regarded as the probability that the CB becomes at-the-money (or in-the-money) by the time of the final maturity. Janjigian (1987) assumed that the underlying stock prices are lognormally distributed and the logarithm of the prices are normally distributed, and then he estimated the probability of conversion to be equal to $N(\frac{\ln(K) - \ln(S)}{\sigma T})$, where "*K*", "*S*", and σ are defined to be the same as above, and *T* is the remaining time to maturity.

Lewis, Rogalski and Seward (1999) equated CBs with European call options on the issuers' outstanding common equities, with the strike prices equal to the CBs' conversion prices. By assuming that the stock prices follow geometric Brownian motion, $dS_t / S_t = \mu dt + \sigma dW_t$, they proxied the probability that the CB get converted by the end of the maturity as $p = N(d_2)$, where $d_1 = \frac{\ln(S/K) + (r - d - \sigma^2/2)T}{\sigma\sqrt{T}}$, which is derived from the modified version of Black-Scholes option pricing model.

3.1.4 Hedge Ratio

Assume that the call warrant in CB is the only portion that is affected by changes in the stock price, the change in the value of CB due to a change in the stock price is measured by the hedge ratio delta, Δ, which reflects the sensitivity of CB to the issuer's outstanding common equity. Using replicate portfolio technique, the payoff from holding a unit of CB can be obtained by holding Δ units of the underlying stock and borrowing an amount of cash up to *B*, such that $CB = \Delta S + B$. Under the Black-Scholes option pricing framework, Δ equals to $e^{-dT}N(d_1)$, where $d_1 = \frac{\ln(S/K) + (r - d + \sigma^2/2)T}{\sigma\sqrt{T}}$, and the input variables are the same as those for computing the conversion probability "*p*" in Lewis, Rogalski and Seward (1999).

Burlacu (2000) was the first to employ the hedge ratio Δ to divide the whole sample of CBs into different subsamples with different proportions of relative equity components. This measurement has also been applied by Ammann, Fehr and Seiz (2006) and Loncarski, Horst and Veld (2006) to analyze subsamples of CBs.

3.2 Comparison among Measurements of Equity Components

Both the issuers' current stock prices (*S*) and the conversion prices (*K*) are directly observable by the time the CBs are offered, therefore "*moneyness*", which merely base on *S* and *K,* is the easiest to compute. But the weakness in "*moneyness*" is apparent, since it does not take into account effects other than the distance between the current stock price and the conversion price. Also we notice that the effect of "*moneyness*" is incorporated in the other variables introduced above.

The expected time to becoming at-the-money, "*Time*", is superior to *"moneyness"* in that it includes the growth rates of the underlying stock prices (μ). But the major difficulty in computing "*Time*" is the estimation of μ, which is not directly observable. The conversion probability defined in Janjigian (1987) is also superior to "*moneyness*" by adding the effects of the volatility of the underlying stock returns (σ) and CB's time to maturity (*T*).

The conversion probability (*p*) introduced by Lewis, Rogalski and Seward (1999) and the hedge ratio Δ are both derived from the modified Black-Scholes model, which not only incorporate the effect of "*moneyness*", but also covers the effects of the issuer's dividend policy (*d*), the volatility of the underlying stock return (σ), as well as the time to maturity (*T*). The dividend policy is useful because the investors need to compare the coupon rate of a CB with the issuer's dividend payouts when deciding whether to convert the CB into equities, and the volatility of the underlying stock returns is also important because higher volatility indicates a higher probability that the stock price surpasses the conversion price within a given period of time, rendering the CB to be more equity-like.

Because of wider coverage of input variables, "*p*" and Δ are superior to "*moneyness*" and "*Time*". However, we notice that "*p*", which is derived under the risk neutral probability measure, may not reflect the true probability that the investors convert CBs into equities. The returns by investing in CBs equal to the risk-free rate of return (*r*) under the risk neutral probability measure, but in reality the investors require returns more than *r* due to the risks involved. A correct conversion probability should be derived under the true probability measure. Assuming that the underlying stock price of CB follows geometric Brownian motion, the conversion probability of CBs (*Pr*) is approximated by the probability that the embedded call option in CB expires in-the-money or at-the-money by the time of maturity *T*, so that the conversion probability $Pr = N\left(\frac{\ln(S_t/K)+T(\mu-\sigma^2/2)}{\sigma\sqrt{T}}\right)$.

By comparison, we recommend the use of Δ as a preferable measurement of the relative equity components in CBs, and in this paper we employ Δ as the criterion to divide the whole sample of CBs into different subsamples. Besides, we compute "*moneyness*", the expected time to becoming at-the-money, "*Time*", and conversion probability as references. But we made some modifications to these indices. The "*Time*" used here differs from that in Davidson, Glascock and Schwartz (1995) by assuming a continuous compounded rate of stock price appreciation[9], "*moneyness*" is modified from that of Yu (2005)'s and Zabolotnyuk, Jones and Veld (2007)'s to be equal to (*S*-*K*)/*K*, and conversion probability, "*Pr*", is derived under true probability measure.

4. Data and Sample Description

4.1 Data

Our initial sample consists of all the CB offerings on the US market from 1976 to 2006, which is obtained from the Securities Data Company (SDC Platinum) global new issues database[10]. The information for CB issuers' stock prices and stock returns are obtained from the Center for Research in Security Prices (CRSP) daily returns and monthly returns files. The issuers' financial data are obtained from Standard & Poor's COMPUSTAT Industrial annual database. We also referred to DataStream for the daily US treasure constant maturities 10 year-middle rate, the International Brokers Estimate System

[9] We also computed the "expected time to becoming at-the-money" in exactly the way introduced by Davidson, Glascock and Schwarz (1995), where the expected rate of stock price appreciation is not continuously compounded, and we find that the results do not differ very much. The modification of "moneyness" also does not change the results qualitatively from using "*S*/*K*" directly as in Yu (2005) etc.

[10] The SDC global new issue database report the records for convertible bond offerings started from 1970, but the complete data descriptions started from 1976.

(IBES) database for the estimation of the issuers' EPS growth rate, and the Lexis-Nexis for manual collation of each of the announcement date of CB offerings.

The SDC global new issues database reports 1733 CB offerings over the period from 1976 to 2006, and the raw data from SDC are then processed by the following steps.

Firstly, we follow the literatures to exclude the issuers from the regulated utilities industry, the financial institutions, and their holding companies, whose capital structure arrangements and market reactions are found to be different from industrial companies. The issuers' industries are identified by their 3-digit Standard Industry Classification codes (SIC codes). The utility industry has SIC codes equal to 481, 491, 492, 493, and 494, and the financial industry has SIC codes from 600 to 699. This step reduces the sample to be 1319 observations.

Secondly, we exclude the CB offering observations whose initiators do not have outstanding equities' information over a [-250, 250] days' window in CRSP daily returns file. This step further reduces the sample size to be 977 observations.

Thirdly, we manually collate the announcement date of each CB offering by comparing the SDC "filing date" with the announcements in Lexis-Nexis dataset[11]. The SDC "filing date" is the date on which a company files a registration statement with the Securities and Exchange Commission (SEC), which can be roughly taken as the announcement date of a CB offering. But due to the sensitivity of an event study to the event dates, we refer to the Lexis-Nexis dataset to guarantee a more accurate date of the announcement of CB offering. 8 more observations are deleted either because their SDC "filing dates" are not verified by information in the Lexis-Nexis dataset or because the issuers announced multiple CB offerings on one day. After this step, the sample contains 969 observations, which constitute the sample for short-run event study.

For the purpose of a long-run analysis, where we examine the annual performance of CB issuers' over [-3, 3] years, a 7-year sample period centered on the year of CB offerings, we need to further eliminate the issuers that do not have financial data reported in COMPUSTAT within the [-3, 3] years' widow. This step reduces the sample size to be 726 observations[12]. One more problem confronting the long-run analysis is the overlapping offerings that are observed within the same event window. Some

11 We use 2 files of Lexis-Nexis, namely, the "Major Newspapers" and the "Wire Service Stories". "Major Newspapers" include US newspapers that are listed in the top 50 circulation in Editor & Publisher Year Book, such as the New York Times and the Washington Post, and the newspapers published outside the US are listed in Benn's World Media directory or one of the top 5% in circulation for the country. The "Wire services" group file contains all newswires from the ALLNWS group file.

12 Two observations are deleted because of inconsistent data reported in COMPUSTAT.

firms are found to have multiple offerings within one year or during years that are very close to one another, and the inclusion of overlapping offerings will lead to bias. In order to circumvent this problem and maintain accuracy in the post-offering long run analysis, for each issuer we retain its first offering in the whole sample period (corresponding to year 0) and delete all the offerings that occur within the (0, 3] years' window. When a second offering is retained, similar procedure is applied to eliminate offering observations within (0, 3] of this second one. Finally, we have a clean sample of 619 observations for the long-run analysis.

4.2 Sample Description

4.2.1 Whole Sample of Convertible Bond Offerings

Figure 1.1 displays the annual CB offerings over the year 1976 to 2006 in terms of frequency throughout the 31 years[13]. We notice that during the bearish period of the stock market in the 1970s, only few firms issued CBs, and as the stock market gradually revived in the 1980s, the number of CB offerings saw a large increase. The CB offering activity peaked in the mid 1980s, and thereafter it remained at a relatively stable level. This trend is very similar to the SEO activity as reported in Loughran and Ritter (1997). Figure 1.2 describes the dollar amount of CB offerings measured by sum of proceeds, from which we notice that although the number of CB offerings became much leveled off after the mid 1980s, the annual offering amount is increasing over time.

[Insert Figure 1 and Figure 2 Here]

Figure 2 describe the industry distribution of CB offerings. In comparison with the industry distribution of SEOs in Loughran and Ritter (1997)'s, we find that the industries on the top of the CB offering frequency list are the same as the top industries that initiate SEOs. The top six industries make up 81.26% of all the CB offerings in the past three decades.

4.2.2 Subsampling Criterion

We employ the hedge ratio Δ, derived from the modified Black-Scholes option pricing model, as the subsampling criterion. Δ measures the sensitivity of CBs to the issuers' outstanding equities, which is defined as:

[13] The reported sample has 969 observations, which constitute the sample of our short-run study. The information for the sample of long-run analysis is qualitatively the same, and thus the report is omitted.

$$\Delta = e^{-dT} N\left(\frac{\ln(S/K) + (r - d + \sigma^2/2)T}{\sigma\sqrt{T}}\right), \qquad (1)$$

where N{ } is CDF of standard normal distribution, and the input variables are:

i) The current stock price (S), estimated by the average stock price in the 2 weeks prior to the CB offering announcement, that is [-15,-6] trading days relative the offering announcement date (day 0);
ii) The conversion price (K), obtained directly from SDC;
iii) The annualized continuously compounded risk free rate on the date of the CB offering announcement (r), estimated using the daily US treasure constant maturities 10 year-middle rate reported by DataStream, and then converted into a continuously compounded form[14];
iv) The annualized continuously compounded dividend yield of CB issuer (d), computed as the ratio of the issuer's ex-date dividends per share (COMPUSTAT data item 26) / Fiscal year close price (COMPUSTAT data item 199) immediately prior to the year of the offering and then transferred into a continuously compounded form;
v) The annualized volatility of the issuer's continuous compounded log stock returns (σ), which is calculated using the [-240, -40] days' historical stock price data from CRSP[15];
vi) The time to maturity (T), calculated as the number of years between the "final maturity" (obtained from SDC) and the year of the CB offering.

The distribution of the estimated Δ is displayed in Figure 4, and the summary statistics for Δ are reported in Table 1. Δ ranges from a minimum of 0 to a maximum of 1, with a mean of 0.7627. The higher the value of Δ, the more equity-like the CB is. When Δ approaches 1, the CB can be viewed as quasi-equity, and as Δ approaches 0, it can be viewed as quasi-debt.

[Insert Table 1, Table 2 and Figure 3 Here]

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[14] The US treasure constant maturities 10 year-middle rate reported in DataStream is already in annualized form, on a 360 days per year basis.

[15] Annualized on a 252 trading day basis.

By setting aside the observations where Δ are calculated as missing (corresponding to 174 observations), the whole sample of CB offerings is then divided into 3 subsample portfolios, the debt-like portfolio, the mixed portfolio, and the equity portfolio, with equal sizes of 265 CB offering observations. Summary statistics for the subsamples CBs are reported in Table 1. The debt-like portfolio consists of CBs with the least proportions of equity components (average Δ = 0.456), the equity-like portfolio consist of CBs with the most proportions of equity components (average Δ = 0.974), and the mixed portfolio consists of CBs with undistinguishable components of equity and debt (average Δ = 0.859). The mixed portfolio itself is not a subject of interest because of the ambiguous information it signals, but the introduction of it allows us to better focus on the 2 extreme portfolios.

The other two measurements of the equity components in CBs, "*moneyness*" and "*Time*", are also computed and reported.

$$moneyness = (S-K)/K \quad (2)$$

$$Time = [ln(K)-ln(S)]/\mu \quad (3)$$

$$Pr = N\left(\frac{\ln(S_t/K)+T(\mu-\sigma^2/2)}{\sigma\sqrt{T}}\right) \quad (4)$$

where S and K are defined and calculated the same as those in computing Δ, and μ is the estimated growth rate of the issuer's EPS. Following Davidson, Glascock and Schwartz (1995), we proxy μ using the "Estimated Five-year Growth Rate-Median" obtained from the IBES tapes, which is the expected average annual growth rate over 5 years subsequent to the CB offering, and then we convert it into a continuously compounded version.

As shown in Table 1, "*moneyness*" ranges from -0.8454 to 11.3733 with a mean of -0.1075. Negative values of "*moneyness*" correspond to out-of-the-money CB offerings and positive values of "*moneyness*" correspond to in-the-money CB offerings. CBs that are offered deep out-of-the-money tend to be more debt-like. We notice that 848 out of the 960 CBs are offered out-of-the-money, 120 CBs are offered in-the-money, and 1 CB is offered exactly at-the-money. Because of the existence of in-the-money and at-the-money CB offerings, when computing "*Time*", the expected time to becoming at-the-money, we set those "*Time*" which are calculated as negative to be 0[16]. Table 1 shows that the maximum "*Time*" is 243.39

[16] By setting the value of *Time* to be 0 for all the in-the-money offerings, we find that the statistical significance of *Time* in explaining the announcement effect becomes a little smaller than if we do not (as in Davidson, Glascock,

years, with an average value of 1.82 years and a standard deviation of 10.43, indicating that "*Time*" is very volatile.

From Table 1 we see that the average "*moneyness*" of the debt-like portfolio, the mixed portfolio, and the equity-like portfolio are -0.094, -0.149, and -0.083, respectively, and the average "*Time*" of the debt-like portfolio, the mixed portfolio, and the equity-like portfolio are 3.315 years, 1.277 years, and 1.013 years, respectively.

Also shown in Table 1 are summary statistics for the input elements in computing Δ. They are volatility, dividend yield, risk free rate, current stock price, and time to maturity. The Pearson correlation coefficients between Δ, "*moneyness*", and "*Time*" are also reported. Δ and "*moneyness*" are positively correlated with a correlation coefficient of 2.53%, and "*Time*" is negatively correlated with both Δ and "*moneyness*".

4.2.3 Differences of Characteristics of Subsample Portfolios

The differences among subsample CB portfolios are examined and reported in Table 3. We notice that although the other two measurements of equity components, "*moneyness*" and "*Time*", exhibit differences among subsample portfolios, the differences are not significant under the 10% level.

[Insert Table 3 Here]

All of the variables that characterize a specific CB offering (the conversion price *K*, the current stock price *S*, the dividend yield *d*, the stock volatility σ, the time to maturity *T*, the coupon rate, and the issue size) are significantly different between the debt-like portfolio and the equity-like portfolio, except for the dividend yield *d*. Moreover, we notice that although both the conversion price *K* and the current price *S* of the debt-like portfolio are significantly higher than that of the equity-like portfolio, they are in fact positively correlated with each others, which may be the reason why "*moneyness*" do not differ significantly between these two portfolios. The outstanding shares of the debt-like portfolio have higher dividend yield and lower volatility. Also, the CBs in the debt-like portfolio are designed to have shorter time to maturity, lower coupon rates, and larger issue sizes.

The characteristics of issuers from different subsample portfolios also exhibit some differences. First, the issuers that offer debt-like CBs are of larger firm scales, characterized by having the highest total

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and Schwarz, 1995). But this change does not affect the qualitative result, and we maintain it because this allows us to better reflect the reality.

assets and market value of equity (MVE). The issuers that offer equity-like CBs, in contrast, are small firms with the fewest assets and the lowest MVE. Second, both the common shares outstanding and the debt in current liabilities are higher of the debt-like portfolio than that of the equity-portfolio, but they may be correlated with the effects of the firm scale because the financial leverage do not differ significantly between them. Third, companies that offer debt-like CBs have more sales and higher earnings, while they incur higher R&D expenditures and higher capital expenditures. Notice, however, when we the expenses are scaled by total assets, we find that the equity-like portfolio have significantly higher relative expenditures. Fourth, firms from the equity-like portfolio are supposed to have higher growth opportunities, because all the indices indicating growth opportunities, such as the median estimate of the growth rate of EPS, μ, the market to book ratio (M/B), and the Tobin's Q ratio of the equity-like portfolio are all higher than that of the debt-like portfolio.

5. Results

5.1 Announcement Effects of Convertible Bond Offerings

The short-run announcement effects are measured by the announcement period abnormal stock returns, which are estimated using the market models. At time-t, the market model for the i-th CB issuer is

$$R_{i,\,t} = \alpha_i + \beta_i R_{m,\,t} + \varepsilon_{i,\,t} \qquad (5)$$

where $R_{i,\,t}$ is the time-t return for the i-th issuer's outstanding equity and $R_{m,\,t}$ is the time-t return of the market. $E(\varepsilon_{i,\,t}) = 0$ and $Var(\varepsilon_{i,t}) = \sigma^2_{\varepsilon_{i,\,t}}$.

The data of daily stock returns in the [-250, -50] days' window are used to estimate the parameters of the market model. The input data are obtained from the CRSP daily return file, and $R_{m,\,t}$ is proxied by the CRSP valued-weight NYSE/AMES/Nasdaq index return. The abnormal stock returns are thus computed as the market model residuals:

$$AR_{i,t} = R_{i,t} - \hat{\alpha}_i - \hat{\beta}_i R_{m,t} \qquad (6)$$

We report the announcement period abnormal stock returns over several different event windows one week before the offering announcements until one week after that. The cumulative abnormal return, CAR (t_1, t_2), is defined as the sum of abnormal returns of from t_1 to t_2 relative to the offering announcement date (date 0). For example, CAR (-2, 2) = $\sum_{t=-2}^{2} AR_{i,\,t}$. The average cumulative abnormal return ACAR(t_1, t_2) is defined as the average of the CAR across *n* observations.

The GARCH-based test statistic is introduced to accommodate the event-induced return volatilities, which are found to bias the performances of the traditional test statistics. Basing on the GARCH (1,1) model, the relationship between the return of equity i and the market return is model by (16).

$$R_{i,t} = \alpha_i + \beta_i \cdot R_{m,t} + \gamma_i \cdot D_t + \eta_{i,t} \tag{7}$$

D_t is an indicator variable which takes a value of 1 if date t is an event day, and 0 otherwise. The conditional distribution of the error terms $\eta_{i,t}$ is assumed to be standard normal, $\eta_{i,t} \mid \Omega_t \sim N(0, h_{i,t})$, where Ω_t denotes the set of information available by date t. The conditional variance is modeled by:

$$h_{i,t} = a_i + b_i \cdot h_{i,t-1} + c_i \cdot \eta_{i,t-1}^2 + d_i \cdot D_t \tag{8}$$

The test statistics t can be formulated as:

$$t = \frac{\sum_{i=1}^{n} S_i / n}{\sqrt{\sum_{i=1}^{n} (S_i - \sum_{i=1}^{n} S_i / n)^2} / \sqrt{n(n-1)}} \tag{9}$$

where $S_i = \hat{\gamma}_i / \sqrt{\hat{h}_{i,t}}$. Savickas (2003) shows that the test statistic has a higher power in detecting abnormal returns than the traditional tests statistics when event induce volatilities, which also has an appropriate size.

[Insert Table 4 Here]

From Table 4 we notice that on exactly the day of announcements and days closely next to the announcements, the abnormal stock returns are all negative. The days with significantly negative abnormal stock returns are found in the [-1, 1] window. The cumulative abnormal stock returns over all the reported windows are significantly negative, suggesting that the announcement effect on a cumulative basis is more robust. As the window expands around the announcement date, however, the negative stock returns become less significant. The differences in AAR among the subsamples are evident. During the days before the issuers' offering announcements, the debt-like portfolio experienced a few days of significantly positive abnormal stock returns, while a similar behavior is not observed in either of the other 2 portfolios. On the date of the offering announcements, all of the 3 portfolios suffered from significantly negative market reactions, while the degree of the reaction to the debt-like portfolio is the lowest (-0.0077) comparing with the equity-like portfolio (-0.0110) and the mixed portfolio (-0.0129). For the debt-like portfolio, the significantly negative market reaction appeared one day prior to the offering announcement, and then from the second day after the offering the stock returns rebounded back to non-negative. The significantly negative market reactions to the other 2 portfolios occurred exactly on the date of the offering announcements, and the returns of the equity-like portfolio did not bounce back into positive subsequent to the offerings.

The ACAR for the 3 subsample portfolios are all significantly negative over our reported windows alike, but we notice that the degree of negative market reactions is strictly monotonically decreasing from the debt-like portfolio, through the mixed portfolio, to the equity-like portfolio. The ACAR (-2, 2), which is computed by summing up the abnormal returns one week around the offering announcement, is -0.0136 for the debt-like portfolio, -0.0224 for the mixed portfolio, and -0.0269 for the equity-like portfolio. Also, the significance of the announcement effect, measured by the standardized cross sectional t statistics, is lower for the debt-like portfolio. All the findings are in support of the pecking order hypothesis that the equity-components signal more negative information to the market.

The testing results of differences in ACAR between pair-wised subsamples are reported in Table 4, where we notice a strict hierarchy of pecking order (the negative market reactions to the equity-like portfolio are the most severe and the reactions to the debt-like portfolio are the slightest) except for the (0, 1) day window, when the most severe negative market reaction is found in the mixed portfolio.

5.2 Long-run Stock Return Performances

The efficiency of the stock market has long been questioned, casting doubt on the ability of the market to absorb all the information and make a full reaction in the short-run. Therefore a long-run analysis provides a better view into the effects of CB offerings. Lewis, Rogalski and Seward (2001) studied into the [-5, 5] years' long run performance of CB offerings between 1979 and 1990 in the US market, and their results show that the differences in performances between the CB issuers and the non-issuers became insignificant since the fourth year after the CB offering. In our analysis, we hence examine the long-run performances [-3, 3] years around the CB offerings. Our whole sample for the long-run analysis consists of 620 CB offering observations[17] over 1976 to 2006.

We intend to test the hypotheses that 1) the stock returns of the equity-like portfolio significantly reduced from the pre offering period to the post offering period, and 2) in the post offering period, returns from the equity-like portfolio underperform that of the debt-like portfolio.

5.2.1 Comparison of the Pre and Post Offering Stock Returns

A. Long-run buy-and-hold stock returns

The long-run stock return performance is measured by the holding period buy and hold returns (BHR). We follow Eckbo, Masulis and Norli (2000) to define BHR for portfolio j with n equities components over a holding period from T_1 to T_2 as:

$$BHR_j \equiv \sum_{i=1}^{n} \omega_i \left[\prod_{t=T_1}^{T_2} (1+R_{i,t}) - 1 \right] \tag{10}$$

where $\omega_i = MVE_i / \sum_{i=1}^{n} MVE_i$ for a value-weighted (V.W.) portfolio and $\omega_i = 1/n$ for an equal-weighed (E.W.) portfolio.

The CRSP monthly return file is referred to as a source of returns $R_{i,t}$. If a stock is delisted from the market before the end of the [-3, 3] years' window, then the holding period is calculated till the time when it is delisted. The abnormal performances are then measured by the differences between the CB issuers' BHR and the benchmarks' BHR, denoted as *diff.*. Two benchmarks are applied here. One is the non-issuing matching firms which are identified as what Lewis, Rogalski and Seward (2001) introduced, and the other one is the CRSP index, the data for which are also obtained from CRSP monthly return file. A detailed statement of how a non-issuing matching firm is identified for each CB issuer is given in next subsection (section 5.3).

Both the value-weighted and the equal-weighted portfolios are constructed, for value-weighted portfolios, the benchmarks are also value-weighted, and for equal-weighted portfolios, the benchmarks are also equal-weighted. The [-3, 3] years' buy and hold returns and the abnormal returns are reported in Table 5 Panel A.

[Insert Table 5 Here]

[17] We have also studied into a [-5, 5] period long-run operating performance of CB issuers and find the similar diminishment in offering impact since the fourth year after the offering.

During the pre-offering [-3, 0] years' period, all the E.W. CB issuers outperformed their benchmarks at 1% significance levels, except for the E.W. debt-like portfolio which only insignificantly outperformed the matching firms. The results when using the V.W. portfolios are virtually the same, but the outperformances of the CB issuers' stock returns became less significant. This phenomenon is consistent with Brav et al. (1995), Mitchell and Stafford (1998), Loughran and Ritter (2000), and Spiess and Affleck-Graves (1999), who found insignificant long-run abnormal stock returns when using value-weighted portfolios. Loughran and Ritter (2000) argued that tests based on value-weighted returns have low power to detect economically significant abnormal performance when the abnormal performance is expected to be more severe among smaller firms. Spiess and Affleck-Graves (1999) claimed that the choice of equal-weighted or value-weighted portfolios is an issue of perspective rather than one of methodological correctness. When measuring the aggregate wealth effects experienced by investors, the value-weighting is appropriate. If the perspective is to measure the abnormal returns of a typical firm undergoing a particular event, then equal-weighting is appropriate.

In the 3 years subsequent to the CB offerings, returns from almost all the portfolios underperform that of the benchmarks. Using both value-weighting and equal-weighting, the underperformances experienced by the equity-like portfolio were the most significant and severe. On the other hand, the underperformance of the debt-like portfolio was not significant using either value-weighting or equal-weighting.

B. Fama French three factor model

In examining the port-offering long-term abnormal stock return of the issuers, we also apply Fama and French (1993) three-factor regression model to construct calendar-time portfolios, which controls for cross-sectional dependence.

$$R(t) - RF(t) = \alpha + \beta[RM(t) - RF(t)] + sSMB(t) + hHML(t) + \varepsilon(t) \quad (11)$$

The Fama French three factor regression model takes a form of (16), where we form 383 monthly portfolios from February, 1976 to December, 2007 for the whole sample CB offering observations. In order to be parallel with the other part of the paper, which examine [-3, 3] years' long-run performances of the issuers, we modify the portfolio selection period to be 36 months, so that $R(t)$ is the return of month-t portfolio which is the weighted stock returns by all issuers that offered CBs in the past 36 months. $RF(t)$ is risk-free rate at month-t, $RM(t)$ is the NYSE, Amex, and NASDAQ value-weighted stock return in month-t, $SMB(t)$ is the return on small firms minus the return on large firms in month-t, $HML(t)$

is the return on high book-to-market stock returns minus the low book-to-market stock returns in month-t, $\varepsilon(t)$ is the disturbance. Thus, the intercept α describes the abnormal stock return of the month-t portfolio.

Again we construct the portfolios using both equal weighting and value weighting. Denote the number of companies included in each time series portfolio as n and ω_t is the weight for it, so that where $\omega_t = MVE_t / \sum_{t=1}^{n} MVE_t$ for a value-weighted (V.W.) portfolio and $\omega_t = 1/n$ for an equal-weighed (E.W.) portfolio. The number of companies in the 383 time series portfolios ranges from a maximum of 170 to a minimum of 1. Table 6 presents the result whole sample long-run stock returns. We notice that when using equal-weighted portfolio, the stock returns are significantly negative when we use both ordinary least squares (OLS) and weight least squares (WLS), the weight of which equals the number of companies in the monthly portfolios. However, when using value-weighted portfolio, the stock returns are insignificantly positive.

We also run the three factor regressions for each of the three sub-sample portfolios, respectively. There are 383 monthly bond-like portfolios from February, 1976 to December, 2007, with a maximum of 45 companies per portfolio to a minimum of 1 company in each portfolio. There are 382 monthly mixed portfolios from March, 1976 to December, 2007, with a maximum of 38 companies per portfolio to a minimum of 1 company in each portfolio. There are 342 discontinuous monthly equity-like portfolios from June, 1976 to December, 2007, with a maximum of 84 companies per portfolio to a minimum of 1 company in each portfolio. The results for subsample portfolios are also reported. We see that the abnormal stock returns for the equal-weighed debt-like portfolio are significantly negative when using both ordinary least square and weight least square. When value weighted, the negative abnormal stock return becomes insignificant using ordinary least square and the abnormal stock return becomes insignificantly positive when using weight least square. For the mixed CB offerings, the abnormal stock returns are negative when equal weighted and positive when value weighted. The abnormal stock return for the stock-like portfolios are all negative both equal weighted and value weighted, but the negative abnormal stock return is only significant when using weight least square.

5.2.2 Comparison of Long-run Stock Returns among Subsample Portfolios

Table 5 Panel B compares the average stock returns of the debt-like portfolio and the equity-like portfolios around the CB offerings. During the pre offering [-3, 0] years' period, the stock returns of the equity-like portfolio significantly outperformed that of the debt-like portfolio's at a 10% significance level when valued-weighted and at a 5% significance level when both are equally-weighted. During the post offering 3 years, the condition is reversed, and the equity-like portfolio significantly underperforms the debt-like portfolio at a 1% significance level when both of them are equal-weighted, although the underperformance is insignificant when they are value-weighted.

The results in Table 6 report the post-offering long-run abnormal stock returns for subsample portfolios using three factor regression technique , from which we see that the negative abnormal stock return of the equity-like portfolio is always more severe than that of the debt-like portfolio either equal-weighted or value-weighted and regardless of using ordinary least square or weight least square.

5.3 Long-run Operating Performances

The stock return performances tend to be reflections of the issuers' operating performances. We then examine the [-3, 3] years' operating performances of the CB issuers', and we intend to test the hypotheses that over a post offering long-run period, 1) the companies that offered equity-like CBs experience a more severe deterioration in their operating performances, and 2) they underperform companies that offered debt-like CBs.

5.3.1 Comparison of Pre and Post Offering Operating Performance

In literatures, there is no one indicator of operating performance regarded as most preferable. McLaughlin, Safieddine, and Vasudevan (1998) and Barber and Lyon (1996) used pre-tax operating cash flows, Hansen and Crutchley (1990) used earnings before interest and taxes, and Loughran and Ritter (1997) used ROA, OIBD, etc.

We measure the companies' operating performances by the OIBD/Assets, which is defined by dividing the sum of operating income before depreciation and interest rate by total assets[18]. OIBD/Assets is a measurement of the cash flow operating performance which provides evidence on the efficient utilization and profitability of the companies' assets-in-place.

[Insert Table 7 Here]

Table 7 lists the operating performance for the whole sample and the subsample portfolios. When viewed as a whole, the CB issuers experienced a decline in their operating performances from the pre-offering period to the post-offering period. The average (median) pre-offering operating performance is

[18] OIBD/Assets =(COMPUSTAT data item 13+ COMPUSTAT data item 62)*100/ COMPUSTAT data item 6.

12.312 (14.429), which is much higher than the post-offering operating performance of 10.559 (12.271)[19]. The change in the mean (median) operating performance from the pre-offering period to the post-offering period is significant at a 5% (1%) level. Although we find a deterioration in the median CB issuer's post-offering operating performance, which is similar to Lewis, Rogalski and Seward (2001), we do not observe a similar improvement in the median issuer's operating performance during the 3 years prior to the offering, as Lewis, Rogalski and Seward (2001) reported.

By viewing into the results from a subsampling perspective, the mean (median) operating performance declined from the pre-offering period to the post-offering period for all the subsamples alike. The degree of operating performance deterioration exhibits a pecking order hierarchy where the equity-like portfolio went through the largest degree of performance deterioration and the debt-like portfolio experienced the slightest degree of performance deterioration. Although the median pre and post offering changes for all the 3 subsamples are significant when using Wilcoxon signed-rank test, the change in average operating performances are neither significant for the debt-like portfolio nor significant for the mixed portfolio.

We are concerned with how much the industry-wide factors affect the issuers' performances, so we remove the industry effects before assessing the issuers' abnormal performances. For each of the 620 CB issuers in our sample for long-run analysis, we find its non-issuing counterpart basing on similarities in industry affiliation, asset size, and normalized operating income, and then we compute the issuers' abnormal performances by subtracting the matching firms' OIBD/Asset from the issuers' realized OIBD/Assets.

Specifically, we follow the same procedure which Lewis, Rogalski and Seward (2001) introduced in finding a non-issuing matching firm for each CB issuer.

Step 1: Select all the firms which are in the same industry of each issuer's (according to the issuer's the two-digit SIC code) and have stock information reported in CRSP and financial information reported in COMPUSTAT.

Step 2: Retain the candidates whose end-of-year assets are within 25% to 200% of that of the issuer's, and then the one with the closest OIBD/Assets ratio to that of the issuer's is chosen as the matching firm.

[19] The year of CB offering is year 0, which is neither include in the pre-offering period [-3, -1], nor included in the post-offering period [1, 3].

Step 3: If no non-issuer meets the criterion above, then all non-issuers with year 0 assets of 90% to 110% of the issuer's are ranked, and then the one with the closest, but higher, OIBD/Assets ratio is selected as the matching firm.

Table 7 Panel B reports the results for the issuers' abnormal operating performances in terms of mean and median. The CB issuers are observed to outperform their matching firms during a few temporary years prior to the offerings, whereas during the whole post-offering period the issuers underperform their matching firms. From the first two columns, we notice that the changes in mean and median abnormal operating performances from the pre-offering period to the post-offering period are significant under the 5% and 1% levels, indicating that the industry effects do not play determinant roles in the deteriorations of CB issuers' operating performances.

Examination into the subsample issuers' performances allow us to see that the changes in average performances of the debt-like portfolio and mixed portfolio are not significant, and the change in average performance of the equity-like portfolio is only significant at a 10% level. The median changes are significant for all subsamples, but we notice that the median change of the debt-like portfolio becomes less significant when using abnormal performance measure (significant under 10% level in Table 7 Panel B) than using the raw performance measure (significant under 5% level in Table 7 Panel A), indicating that a part of the performance deterioration of the debt-like issuer is affected by industry factors, whereas, industry factors do not play as much important roles in the other two subsample portfolios.

5.3.2 Comparison of Operating Performance among Subsample Convertible Bonds

We notice from the results in Table 7 Panel A and Table 7 Panel B that although all of the 3 subsamples of issuers went through deteriorations in average operating performance from the pre-offering period to the post-offering period, significant deterioration in the average operating performance is only found in the equity-like portfolio (t-statistic= -3.14 in Table 7 Panel A and -1.79 in Table 7 Panel B).

Table 7 Panel C displays the comparison results between the debt-like portfolio and the equity-like portfolio in average raw operating performance and average abnormal operating performance. During periods both before and after the CB offerings, the average debt-like issuer outperforms the average equity-like issuer, and this result is robust by removing the industry effect, indicating that the outperformance of the average debt-like issuer is driven by the issuer-specific factors.

As for the median performance, in the pre-offering period, the median equity-like issuer strongly outperform the other CB issuers (16.155 relative to 14.485 of the median debt-like issuer and 13.180 of the median mixed issuer), and this outperformance is not driven by industry effects because its abnormal performance measure (0.237) is also higher than that for the median debt-like issuer (-0.023) and the median mixed issuer (-2.355). In stark contrast, in the post offering period, the median equity-like issuer underperform the debt-like issuer and the mixed issuers to a great extend, which again is mostly determined by the issuer-specific reasons rather than by the industrial factors. The pre and post offering performance changes are the most significant in the median equity-like CB issuers.

To get a clearer picture of how much the industry factors affect the issuers' performances, we compare the issuers and their matching firms over the [-3, 3] years' period. Results are displayed in Table 7 Panel D, where the z-statistics of Wilcoxon sign rank test are reported, testing the null hypotheses of no difference between the median issuers and the median non-issuers. We notice that, for the whole sample of CB issuers, in years prior to the CB offerings, there were not significant differences between the issuers and the non-issuing matching firms, but the issuers' performances differ significantly from that of the non-issuers from exactly the year of the CB offerings, indicating a drastic change in the factors that determine the issuers' performance. When analyzing into subsample CB issuers, we notice that their performances do not differ significantly from their industry matchers before the CB offerings, but from the year of the CB offerings onwards, the median issuer of the mixed portfolio significantly underperformed the industry. Similar finding is observed in the equity-like portfolio, where we find that from the first year subsequent to the CB offering, the median equity-like issuer underperform its industry to a great extend. But over the entire 7 years surrounding the offerings, the operating performance of the median debt-like issuer never differ significantly from its industry matcher.

5.4 Long-run Risks of Convertible Bond Issuers' Outstanding Equities

Besides the operating performance, it is suspected that the stock return performance is also related to the risk level of the equity. In this subsection, we examine into the changes in equity risks around CB offerings.

Referring to the market model (1), the total equity risk of firm-*i* is:

$$Var(R_{i,t}) = \beta_j^2 Var(R_{m,t}) + Var(\varepsilon_{i,t}) \qquad (12)$$

The total risk consists of 2 parts, one is the systematic risk, caused by the risk on the whole market, and the other one is the residual variance which is idiosyncratic of firm- *i*.

[Insert Table 8 Here]

Table 8 Panel A reports changes in annual equity risks from pre offering period to post offering period for the whole sample CB issuers and each of the subsample portfolios. The equity risks in the first year prior to the offerings are estimated using the [-250, 0) days' daily stock returns, the equity risks in the second year prior to the offerings are calculated using the [-504, -250) days' daily stock returns, and the equity risks in the third year prior to the offerings are calculated using the [-756, -504) days' daily stock returns. Similarly, the post offering years' annual risks are calculated using the corresponding daily stock returns.

We notice from Table 8 Panel A that firstly, from the pre offering period to the post offering period, both the average issuer and the median issuer of the whole sample experienced significant decrease in the equity beta and significant increase in the residual variance and the total equity risk. Secondly, the debt-like portfolio underwent significant decrease in the equity beta from the pre offering period to the post offering period. Although the other 2 portfolios also experienced decrease in equity-betas, neither of the changes is significant. Thirdly, the equity-like portfolio went through the most significant increase in residual variance and the total risk.

We also examine the role of industry effect in determining the changes in the equity risks. Table 8 Panel B displays the differences between the risks of the CB issuers and their non-issuing matching firms. First, for the whole sample of CB issuers, the equity beta significantly increased relative to their matching firms since the second year preceding the CB offerings, and the increase in equity-beta continued until the third years after the offerings. At the same time, the issuers' residual variances decreased significantly relative to their industry matchers from the second year prior to the CB offerings until two years after the offerings. The total equity risks of the issuers' also decrease significantly around the CB offerings. Second, for subsample portfolios, similar increases in equity beta relative to the matching firms are found, and the differences between the equity-like portfolio and their matching firms are observed to be the most significant. The equity beta of the debt-like portfolio only significant surpassed that of its matching firms' in the first year subsequent to the CB offerings. Third, the residual variance and the total risks of the debt-like portfolio significant decreased relative to their matching firms both before and after the CB offerings, while similar degrees of decrease in equity risks are not observed in the mixed portfolio or the equity-like portfolio.

By comparing the average equity risks of the debt-like portfolio and the equity-like portfolios (see Table 8 Panel C), we find that in both the pre offering years and the post offering years, the debt-like portfolio is significant less risky than the equity-like portfolio under any one of the risk measures, the equity beta, the residual variance, or the total risk. It is worth noting that during the post offering years, the idiosyncratic risks (residual variance) of the equity-portfolio increased significantly relative to the debt-like portfolio.

5.5 Combination of Results in the Long-run and the Short-run

So far, we have confirmed the findings in previous studies that the CB offerings in the US market as a whole are accompanied with negative abnormal stock returns in the short-run announcement period and the long-run post offerings years.

By surveying into different subsamples, we find that in the short-run, the equity-like CB offerings induce the largest degree of negative market reactions, which are also the most significant and last for the longest time. In the post-offering long-run period, the companies issuing equity-like CBs went through the largest degree of abnormal underperformance in buy and hold stock returns, meanwhile its operating performance deteriorated the most severely, which significantly underperform both the debt-like CB issuers and their industry matchers.

Combining the findings in the short-run and the long-run, there seem to be a large degree of consistency, since the companies that receive the worst market reactions in the short-run indeed turn out to perform the worst in the long-run. We run regression of the short-run announcement effect on the issuers' long-run operating performances, and we find that the post-offering operating performance turns out to be significant explanatory variable for the announcement effect. Results are reported in Table 9, the post-offering 3-year average OIBD/Assets explains 0.95% of the cumulative abnormal stock returns over the (-2, 2) days' event window, where we notice in contrast that the pre-offering operating performance does not have significant effect on the short-run announcement effect.

[Insert Table 9 Here]

We also study the effect of the issuer's long-run operating performance on the announcement effect by controlling the changes in the issuers' equity risks. We include the issuers' equity betas, the residual variances, and the total equity risks, and then re-run the regression of the announcement effect on the explanatory variables for the post-offering period, respectively. Results are reported in Table 9. We notice that in general the short-run announcement effects are not significantly relevant to the issuers' equity risk and the issuer's post-offering operating performance still turns out to be a significant explanatory variable for the announcement effect.

We explain the finding of the consistency between the long-run and short-run by claiming that the market unbiasedlly foresees the issuers' operating performances at the time of the CB offering announcements. Moreover, when we refer back to Table 3, where the median estimate of growth rate of stock price appreciation, the market to book ratio, and Tobin's Q all indicate that firms in the equity-like portfolios are regarded to have greater growth opportunities prior to the CB offerings, it is understandable that the market is immediately adjusting its perception about the issuers' true future performance by observing information signaled by the CB offerings. This finding and explanation is compatible with Lewis, Rogalski and Seward (2001), who pointed out that the post offering deteriorations in the CB issuers' operating performances are not predicted by professional analysts prior to the CB offerings.

6. Conclusions

The convertible bond (CB), which is a nonstandard financing instrument, is hybrid of the straight debt and the common equity, and it is viewed to have a risk level in between that of the straight debt and the common equity. Previous studies have revealed that the announcement period market reaction to CB offerings is right in between the reactions to the straight debt and common equity, for example Mikkelson and Partch (1986). Such phenomenon is consistent with the pecking order hypothesis of the M& M model (1984), which predicts that companies follow a pecking order when they make decisions to procure financings, beginning with a best choice of internal financing and ending up with a worst choice of equity financing. Since this strategy is well understood by the market, different financing decisions are interpreted and received differently by the market.

In this study, we notice that CBs are not uniformly the same throughout the whole sample. While some CBs are more resemblant to straight debts, others are more like common equities. We therefore examined the CBs from a subsampling perspective according to different degrees of equity components in different CBs. The whole universe of CBs can thus be regarded as a miniature of the whole range of debt-equity capital structure.

By introducing and evaluating several measurements of equity components in CBs, we recommend the use of hedge ratio Δ, and then we manage to divide the whole sample of CBs into a debt-like portfolio, a mixed portfolio, and an equity-like portfolio. We find that the short-run announcement effects on CB offerings follow a strict pecking order hierarchy that the companies offering debt-like CBs receive the least degree of negative market reactions, the companies offering equity-like CBs receive the largest degree of negative market reactions, and those that offer CBs with mixed components of debt and equity receive a degree of negative market reaction in between.

A long-run analysis into the CB issuers' stock return performances, operating performances, and changes in equity risks allow us to see that firstly during the years subsequent to the CB offerings, the long-run buy and hold stock returns of the equity-like issuers significantly underperform the industry benchmark and the market index benchmark, and it also significantly under perform the buy and hold stock returns of the debt-like portfolio when both of them are equally weighted. Secondly, in the post-offering period, the issuers of the equity-like portfolio experienced the largest degree of deteriorations in their operating performances both in terms of means and in terms of medians, inducing them to significantly underperform the debt-like CB issuers as well as their industry matchers. Further, by removing the industry effects, we notice that the issuers' post offering operating performances are largely determined by changes in the issuers' specific characteristics. Thirdly, the debt-like portfolio went through significant decrease in the systematic risk (equity beta) and significant increase in the idiosyncratic risk (residual variance) and total risk, while its systematic risk is still (insignificantly) higher than the industry level and the idiosyncratic risk and total risk are still (significantly) lower than the industry level. The equity-like portfolio experienced insignificant decrease in the systematic risk and a significant increase in the idiosyncratic risk and the total risk, while the systematic risk is still (significantly) higher than the industry and the idiosyncratic risk and the total risk are still (insignificantly) lower than the industry level.

Combining our findings for the CB issuers in the short-run and the long-run, we realize that the issuers' long-run performance are to a large extend consistent with the short-run market reactions they have received. In fact, the issuers' post offering realized long-run operating performances significantly explain the announcement period market reactions. We thus conclude by saying that the market unbiasedlly forecasts the issuers' future operating performances basing on the specific designs of CBs at the time when the CBs are offered, and then it reacts accordingly. In the long-run subsequent to the CB offerings, the market perceptions turn into reality, and the perceived bad companies indeed experienced severe deteriorations in their performances, and at the same time they entail more idiosyncratic risks and total equity risks.

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Figure 1 – Annual distribution of sample CB offerings (1976-2006)

Figure 1.1 – Annual distribution of sample CB offerings by frequency

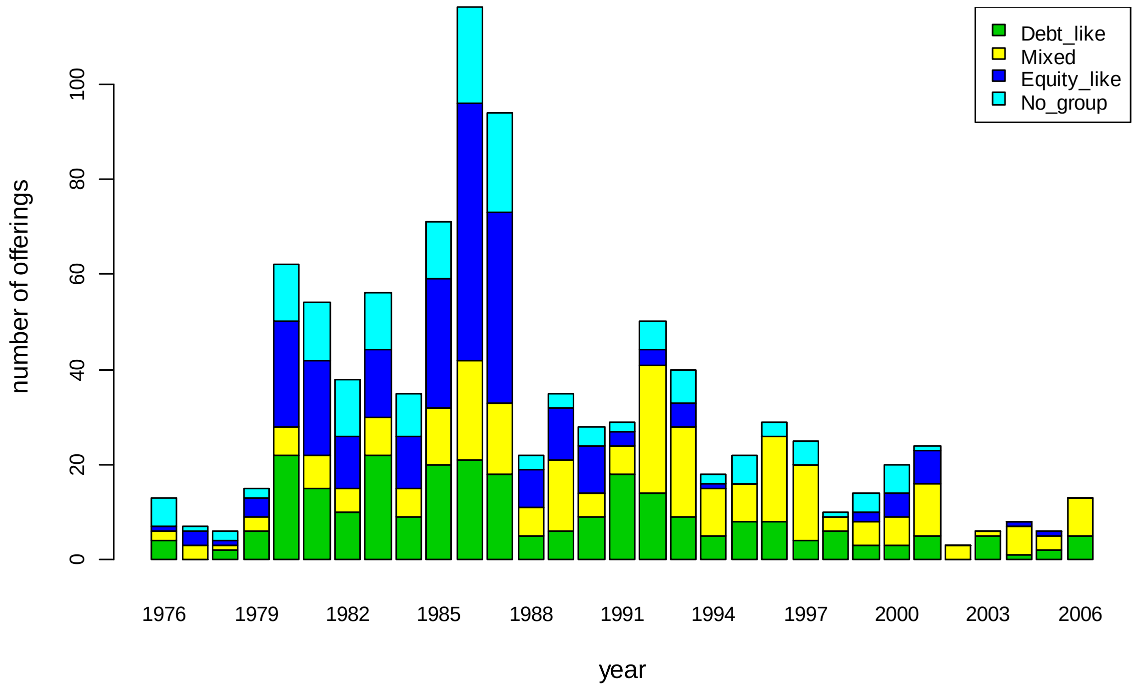
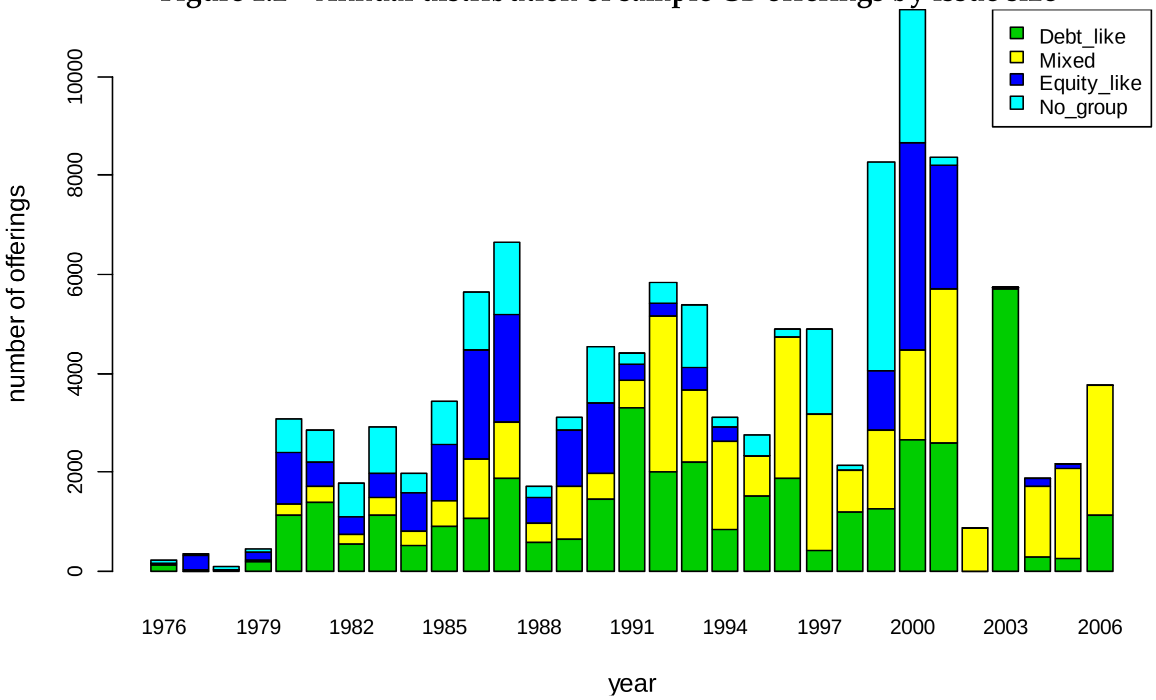


Figure 1.2 – Annual distribution of sample CB offerings by issue size



Note: The sample contains 969 CB offering observations, which is used for the short-run event study. Some of the observations are subject to further elimination for the purpose of long-run analysis. The issue sizes are measured by gross proceeds (in millions of dollars), which are reported by SDC.

Figure 2 – Industry distribution of sample CB offerings (1976-2006)

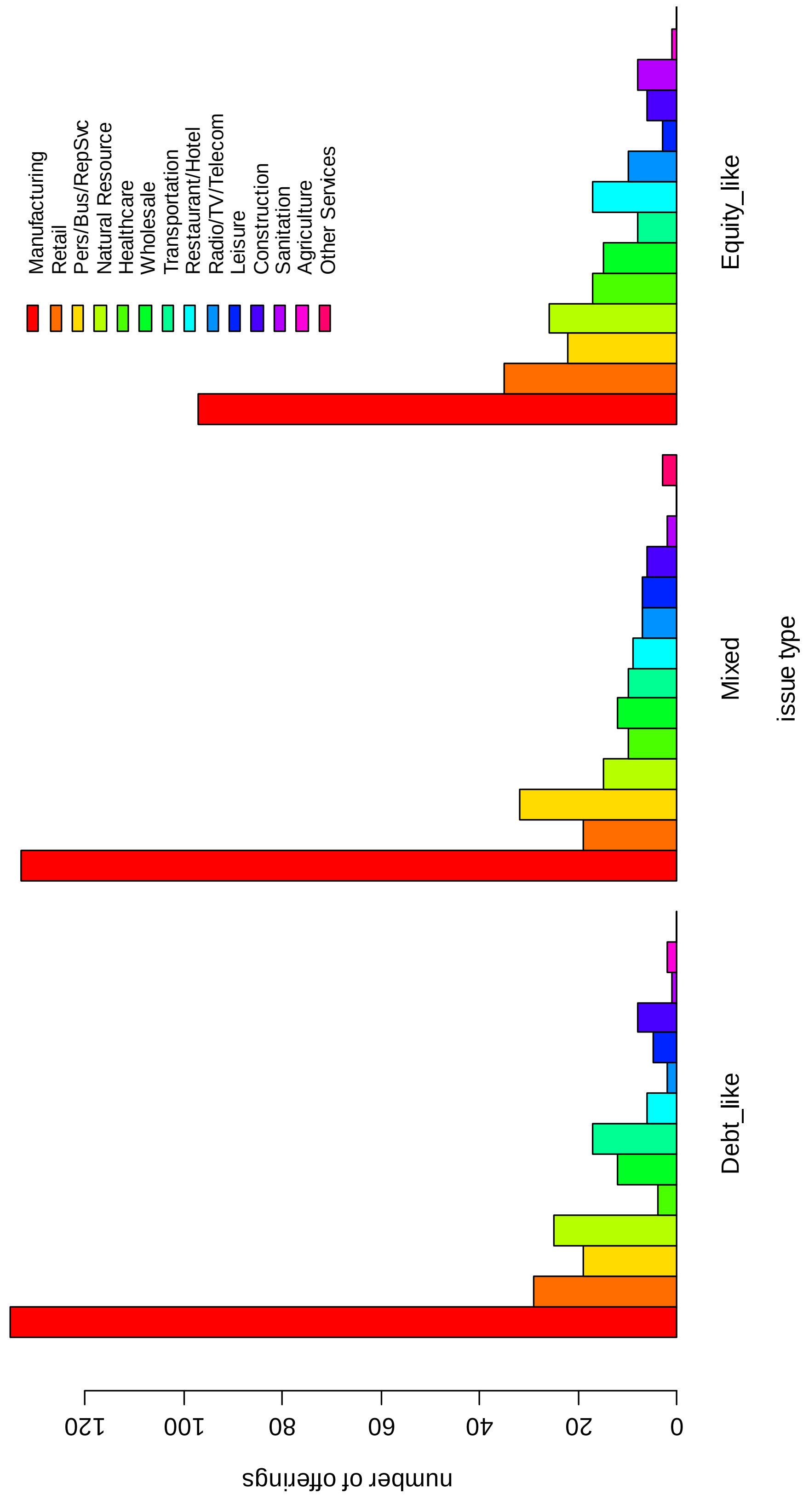
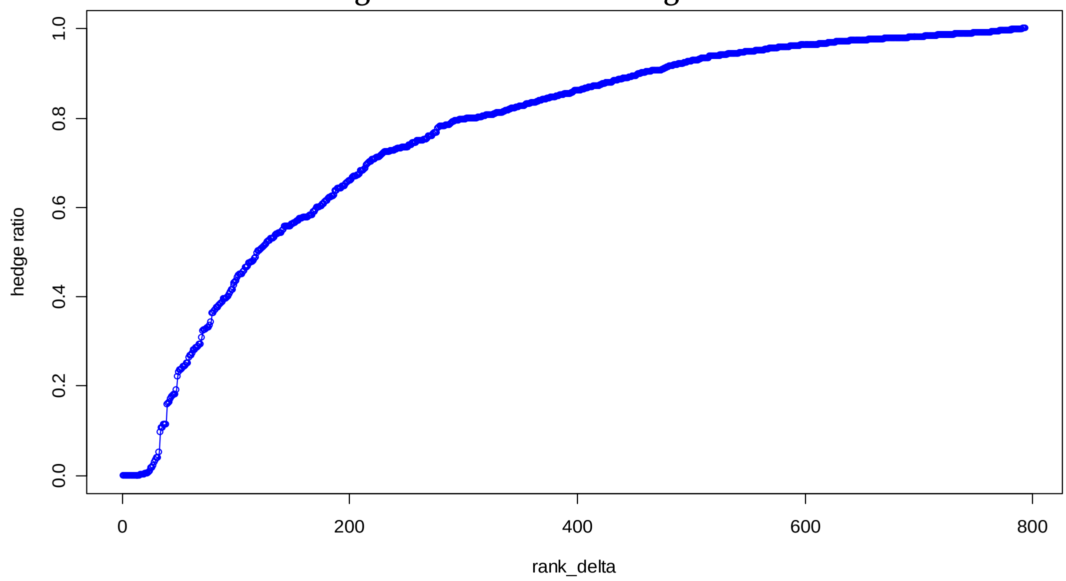


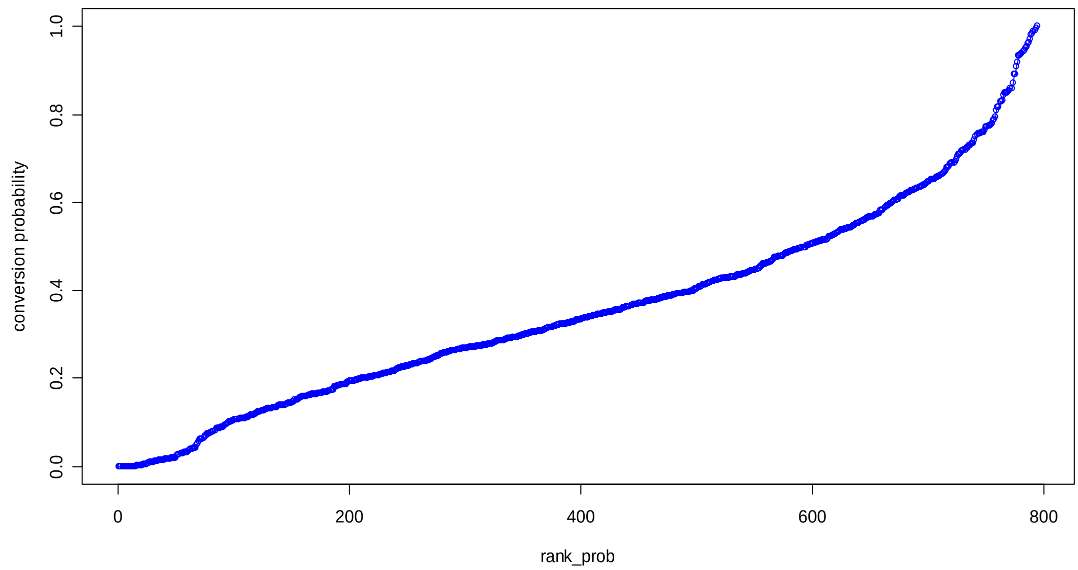
Figure 3 – Plots of estimated values for measurements of equity components

Figure 3.1– Estimated hedge ratio



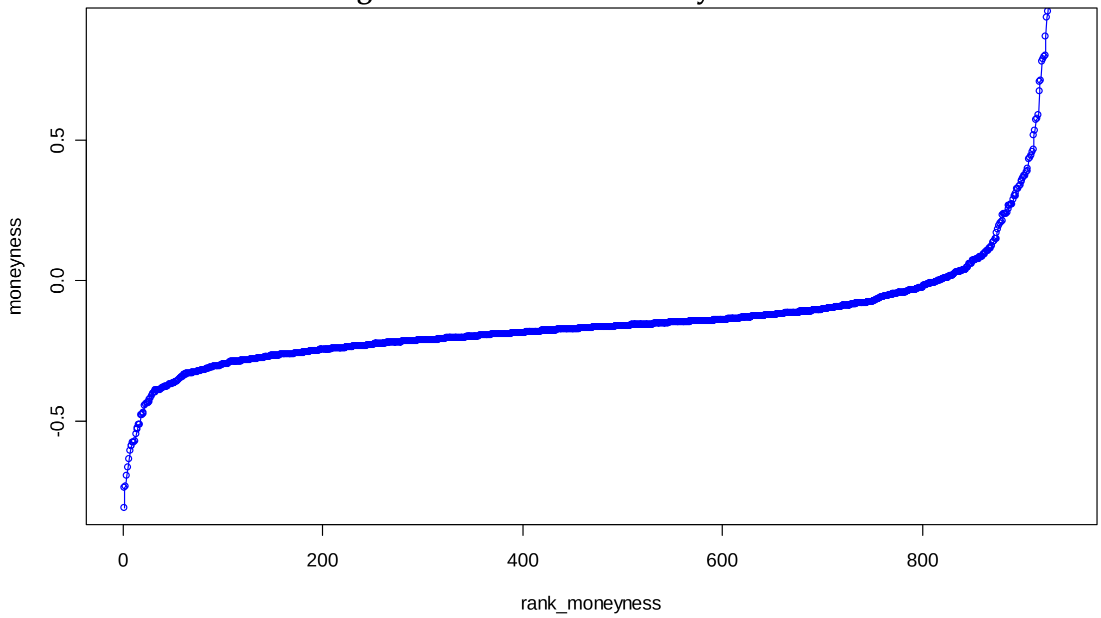
Note: Hedge ratio $\Delta = e^{-dT} N(\frac{\ln(S/K)+(r-d+\sigma^2/2)T}{\sigma\sqrt{T}})$. There are 795 CB offering observations with non-missing values of Δ, which are then ranked in an ascending order. The higher value of Δ, the more equity like the CB is.

Figure 3.2 – Estimated conversion probability



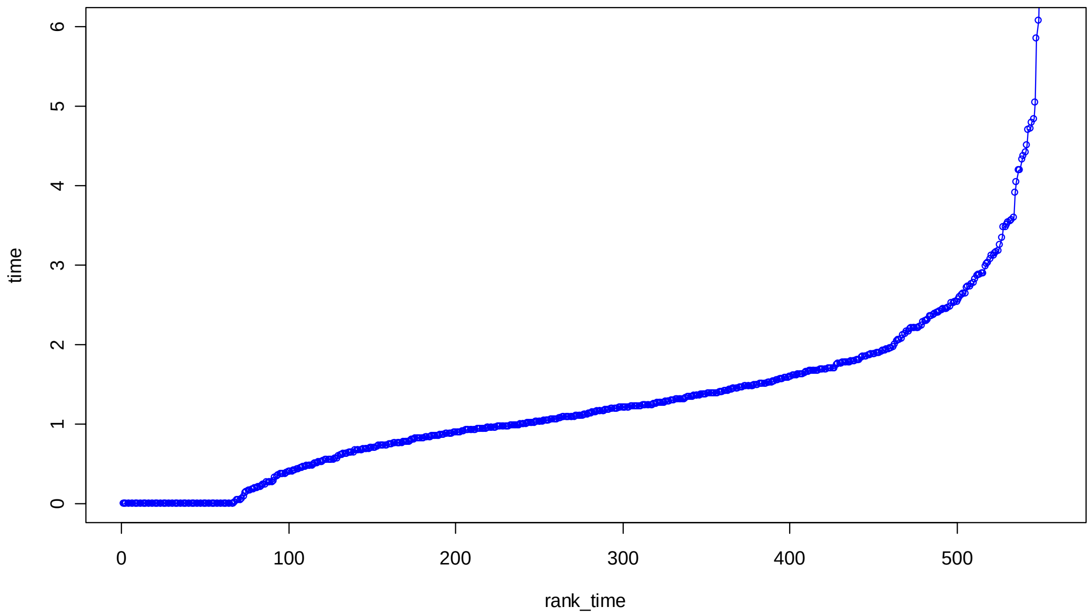
Note: Conversion probability Pr=N$(\frac{\ln(S_t/K)+T(\mu-\sigma^2/2)}{\sigma\sqrt{T}})$. There are 795 CB offering observations with non-missing values of Conversion probability, which are then ranked in an ascending order. The higher the conversion probability the more equity-like the CB is.

Figure 3.3 – Estimated moneyness



Note: *moneyness*= (*S*-*K*)/*K*. There are 938 CB offering observations with non-missing values of moneyness, which are then ranked in an ascending order. The higher the value of moneyness, the more equity-like the CB is designed.

Figure 3.4 – Estimated time to becoming at-the- money



Note: *Time* = [*ln*(*K*)-*ln*(*S*)]/ μ , with μ equals to the anticipated rate of stock price appreciation. There are 556 CB offering observations with non-missing values of *Time*, which are then ranked in an ascending order. The shorter the estimated time to becoming at-the-money, the more equity-like the CB is designed to be.

Table 1 - Summary statistics for measurement of equity components in CBs

Panel A - Whole sample CB offerings

Variable	obs.	Std.	Mean	Min	Median	Max
Hedge Ratio Δ	795	0.263	0.763	0.000	0.858	1.000
conversion probability *Pr*	795	0.228	0.358	0.000	0.332	1.000
moneyness	938	0.523	-0.108	-0.845	-0.169	11.373
Time	556	10.435	1.816	0.000	1.111	243.394
Volatility σ	969	0.264	0.500	0.143	0.433	3.480
Dividend Yield *d*	818	0.105	0.025	0.000	0.000	1.742
Risk Free Rate *r*	969	0.023	0.083	0.032	0.077	0.140
Current Price *S*	968	19.004	26.383	0.635	22.861	272.542
Conversion Price *K*	939	21.566	30.868	0.500	27.250	327.92
Maturity *T*	966	7.14	17.91	3.00	20.00	36.00

Panel B - Debt-like portfolio

Variable	obs.	Std.	Mean	Min	Median	Max
Hedge Ratio Δ	265	0.239	0.457	0.000	0.530	0.750
conversion probability *Pr*	265	0.222	0.339	0.000	0.340	0.997
moneyness	265	0.761	-0.100	-0.845	-0.171	11.373
Time	169	18.806	3.315	0.000	1.373	243.394
Volatility σ	265	0.192	0.401	0.196	0.358	1.876
Dividend Yield *d*	265	0.174	0.073	0.000	0.029	1.742
Risk Free Rate *r*	265	0.023	0.084	0.031	0.079	0.138
Current Price *S*	265	21.834	31.113	2.319	28.042	272.542
Conversion Price *K*	265	20.132	36.533	2.630	33.000	129.130
Maturity *T*	265	7.48	18.22	3.00	20.00	31.00

Panel C - Mixed portfolio

Variable	obs.	Std.	Mean	Min	Median	Max
Hedge Ratio Δ	265	0.052	0.857	0.751	0.858	0.941
conversion probability *Pr*	265	0.211	0.358	0.006	0.314	0.999
moneyness	265	0.244	-0.139	-0.811	-0.175	2.548
Time	175	1.390	1.277	0.000	1.102	14.343
Volatility σ	265	0.210	0.530	0.168	0.506	1.188
Dividend Yield *d*	265	0.006	0.003	0.000	0.000	0.081
Risk Free Rate *r*	265	0.021	0.073	0.038	0.069	0.138
Current Price *S*	265	17.175	24.783	1.399	20.750	134.383
Conversion Price *K*	265	26.310	30.347	1.130	26.250	327.920
Maturity *T*	265	6.93	14.03	3.00	10.00	30.00

Panel D - Equity-like portfolio

Variable	obs.	Std.	Mean	Min	Median	Max
Hedge Ratio Δ	265	0.016	0.974	0.941	0.976	1.000
conversion probability *Pr*	265	0.250	0 .376	0.001	0.342	0.991
moneyness	265	0.482	-0.079	-0.512	-0.162	5.834
Time	144	0.782	1.013	0.000	0.959	4.424
Volatility σ	265	0.266	0.561	0.174	0.503	1.715
Dividend Yield *d*	265	0.000	0.000	0.000	0.000	0.002
Risk Free Rate *r*	265	0.022	0.089	0.042	0.085	0.140
Current Price *S*	265	16.248	22.732	0.635	18.785	95.681
Conversion Price *K*	265	18.706	26.172	0.500	21.750	127.660
Maturity *T*	265	4.67	21.13	5.00	20.00	30.00

Table 2 Pearson correlation coefficients of measurement of equity components

	Δ	*moneyness*	*Time*	*Pr*
Δ	1			
moneyness	0.0253	1		
Time	-0.0253	-0.0534	1	
Pr	0.1816	0.2156	-0.0324	1

Note: Basing on the whole sample of 969 CB offering observations.

Table 3 - Characteristics of different portfolios at the time of CB offerings

The values in Table 3 are average values over different portfolios. MVE is market value of the issuer's outstanding equities, calculated as the product of Common Shares (#54) and Fiscal year end closing price (#199). Financial leverage is computed to be the sum of Total Long-Term Debt (#9), Debt in Current Liabilities (#34), carrying value of Preferred Stock (#130), Dividends of Preferred stocks In Arrears (#242), subtracting Cash and Short- Term Investments (#1) and divided by MVE. CE+RD/ASSETS is defined as the sum of Capital Expenditures (#128) and Research and Development Expense (#46) divided by Total assets (#6). M/B is the ratio of the equity's market value (MVE) over its book value (#60). Tobin's Q is defined by summing MVE, the liquidating value of Preferred Stock (#10), Total Long-Term Debt (#9) and Debt in Current Liabilities (#34), subtracting Cash and Short- Term Investments (#1), and scaling by Total Assets (#6). *, **, and *** correspond to significant difference under 10%, 5%, and 1% levels. The t-statistics are from T-test of the null of no difference in the means of the debt-like and equity-like portfolios.

	All	Debt-like	Mixed	Equity-like	D-E		t- stat.
Measures of equity components							
Hedge ratio Δ	0.76	0.46	0.86	0.97	-0.52	***	-35.11
Conversion Price	0.36	0.34	0.36	0.38	-0.04		1.01
Moneyness	-0.11	-0.09	-0.15	-0.08	-0.01		-0.38
Time	1.82	3.32	1.28	1.01	2.31		1.59
Characteristics of CB offerings							
Conversion Price K	30.88	35.97	30.32	26.08	10.33	***	6.14
Conversion Premium	22.19	22.46	22.46	21.35	1.11	**	1.99
Conversion Ratio	57.51	35.36	35.36	81.26	-45.90	***	5.23
Current Price S	26.39	30.75	24.45	22.54	8.33	***	5.01
Dividend Yield d	0.03	0.07	0.00	0.00	0.07	***	6.84
Volatility σ	0.50	0.40	0.53	0.56	-0.16	***	-7.96
Maturity T	17.90	18.36	14.06	21.19	-2.91	***	-5.38
Coupon (%)	7.70	7.46	6.83	8.43	-0.97	***	-3.93
Issue Size (mil$)	120.52	152.56	128.23	81.79	70.78	***	3.03
Characteristics of CB issuers							
Total Assets (mil$)	2343.57	4745.99	1540.75	366.57	4379.42	**	1.96
MVE	1618.12	2250.45	1683.13	474.67	1775.78	***	4.43
Common Shares Outstanding (mil$)	50.43	66.11	59.67	19.18	46.93	***	3.77
Debt in Current Liabilities (mil$)	204.21	531.58	55.29	10.56	521.01		1.31
Financial Leverage	0.53	0.62	0.56	0.45	0.16		1.58
Net Sales (mil $)	1903.22	3778.01	1330.15	379.10	3398.90	***	3.50
EPS ($)	0.81	1.31	0.43	0.70	0.60	***	2.94
Net Income (Loss) (mil$)	49.58	97.28	15.08	13.17	84.11	***	2.86
R & D Expense (mil$)	83.30	165.94	70.83	20.31	145.63	**	2.51
Capital Expenditures (mil$)	157.41	297.46	113.60	34.31	263.15	**	2.63
CE+RD/ASSETS	14.71	12.43	15.45	16.85	-4.42	***	-3.29
Median Estimate μ	19.90	14.64	21.26	23.99	-9.35	***	-9.59
M/B	2.93	2.33	3.76	2.95	-0.62		-1.24
Tobin's Q (%)	1.41	1.12	1.66	1.48	-0.36	***	-3.92

Table 4 - Announcement effects of CB offerings

AAR is the cross sectional average of daily abnormal returns and ACAR is the cumulative sum of AAR around offering announcements. The t-statistics are GARCH-based test statistics for the null hypothesis of no announcement effects. As the number of observations in a portfolio, *n*, increases to infinity,

$t = \frac{\sum_{i=1}^{n} S_i / n}{\sqrt{\sum_{i=1}^{n} (S_i - \sum_{i=1}^{n} S_i / n)^2} / \sqrt{n(n-1)}} \sim t_{n-1}$, where $S_i = \hat{\gamma}_i / \sqrt{\hat{h}_{i,t}}$, and $\hat{\gamma}_i$ and $\hat{h}_{i,t}$ are estimated from:

$R_{i,t} = \alpha_i + \beta_i \cdot R_{m,t} + \gamma_i \cdot D_t + \eta_{i,t}$, $\eta_{i,t} | \Omega_t \sim N(0, h_{i,t})$, and $h_{i,t} = a_i + b_i \cdot h_{i,t-1} + c_i \cdot \eta_{i,t-1}^2 + d_i \cdot D_t$.

Event window	Whole sample		Debt-like		Mixed		Equity-like		D-E	
	ACAR	t- stat.	ACAR	t- stat.	ACAR	t- stat.	ACAR	t- stat.	ACAR	t
-5	-0.0013	1.33	0.0008	2.25	-0.0015	-0.11	-0.0032	0.64		
-4	0.0000	0.53	0.0030	0.17	0.0003	-1.29	-0.0015	1.08		
-3	0.0000	-0.64	0.0038	1.24	-0.0027	-1.04	-0.0012	-1.11		
-2	-0.0008	0.08	-0.0011	-0.82	-0.0027	1.63	0.0004	-0.79		
-1	-0.0019	-1.32	-0.0024	-1.69	-0.0031	-0.16	0.0000	-0.15		
0	-0.0101	-7.33	-0.0077	-4.74	-0.0110	-3.93	-0.0129	-2.97		
1	-0.0051	-2.18	-0.0025	-0.13	-0.0075	-2.47	-0.0074	-1.82		
2	-0.0015	1.46	0.0001	1.79	-0.0026	0.59	-0.0025	-0.52		
3	-0.0006	0.11	-0.0007	-0.59	-0.0020	1.30	-0.0001	-0.10		
4	0.0005	-1.44	0.0002	-1.07	-0.0011	-1.50	0.0030	-0.31		
5	-0.0013	-1.79	0.0000	0.17	-0.0018	-1.61	-0.0022	-1.45		
(-2,2)	-0.0195	-6.85	-0.0136	-3.77	-0.0269	-4.02	-0.0224	-3.97	0.0088	2.30

Table 5 - Long-run buy and hold returns

Panel A - Long-run BHR

The buy and hold return (BHR) of portfolio j with n component equities through T_1 to T_2 is defined by: $BHR_j \equiv \sum_{i=1}^{n} \omega_i \left[\prod_{t=T_1}^{T_2} (1+R_{i,t}) - 1\right]$, where $\omega_i = MVE_i / \sum_{i=1}^{n} MVE_i$ for a value-weighted (V.W.) portfolio, and $\omega_i = 1/n$ for an equal-weighed (E.W.) portfolio. *diff.* = (average BHR of CB issuers) – (average BHR of matching firms or market index benchmarks). P>| t| is the p value from 2 sided T-test of the null hypothesis that D-E is indifferent from 0.

	Whole sample n=619			Debt-like portfolio n=209			Mixed portfolio n=187			Equity-like portfolio n=180		
Pre offerings [-3, 0] years												
V.W.	BHR	*diff.*	P>|t|	BHR	*diff.*	P>|t|	BHR	*diff.*	P>|t|	BHR	*diff.*	P>|t|
Issuer	1.577			0.706			2.303			3.830		
Match	0.265	1.312	0.017	0.218	0.488	0.172	0.327	1.976	0.459	0.347	3.483	0.039
Index	0.496	1.081	0.009	0.543	0.163	0.305	0.489	1.814	0.116	0.479	3.351	0.041
E.W.												
Issuer	1.321			1.058			1.457			1.544		
Match	0.741	0.580	<.001	0.838	0.220	0.114	0.639	0.818	<.001	0.741	0.803	0.000
Index	0.558	0.763	<.001	0.656	0.402	<.001	0.561	0.896	<.001	0.501	1.043	<.001
Post offerings [0, 3] years												
V.W.	BHR	*diff.*	P>|t|	BHR	*diff.*	P>|t|	BHR	*diff.*	P>|t|	BHR	*diff.*	P>|t|
Issuer	0.171			0.358			0.188			0.053		
Match	0.230	-0.059	0.707	0.373	-0.015	0.784	0.000	0.188	0.257	0.309	-0.256	0.066
Index	0.404	-0.233	0.026	0.442	-0.084	0.602	0.420	-0.232	0.253	0.351	-0.298	0.101
E.W.												
Issuer	0.147			0.350			0.179			-0.05		
Match	0.306	-0.159	0.011	0.418	-0.068	0.798	0.346	-0.167	0.149	0.229	-0.280	0.001
Index	0.374	-0.227	<.001	0.439	-0.089	0.322	0.390	-0.211	0.005	0.301	-0.352	<.001

Panel B - Comparison between Debt-like portfolio and Equity-like portfolio

	D–E	t-stat.	P > |t|
[-3, 3] years			
V.W.	-1.263	-1.63	0.105
E.W.	0.277	0.92	0.359
Pre offerings [-3, 0] years			
V.W.	-3.124	-1.97	0.051
E.W.	-0.486	-2.36	0.019
Post offerings [0, 3] years			
V.W.	0.305	1.12	0.263
E.W.	0.401	3.63	0.000

Note: 1. D–E = (average BHR of the Debt-like portfolio) – (average BHR of the Equity-like portfolio).
2. P>| t| is the p value from 2 sided T-test of the null hypothesis that D–E is indifferent from 0.

Table 6 - Long-run stock return performance by Fama French three factor model

There are 383 monthly whole-sample portfolios with a maximum of 170 companies to a minimum of 1 company in each portfolio (1976:02 – 2007:12), 383 monthly bond-like portfolios with a maximum of 45 companies to a minimum of 1 company in each portfolio(1976:02 – 2007:12), 382 monthly mixed portfolios with a maximum of 38 companies to a minimum of 1 company in each portfolio (1976:03 – 2007:12), 342 discontinuous monthly equity-like portfolios from with a maximum of 84 companies to a minimum of 1 company in each portfolio(1976:06 – 2007:12). White Heteroskedasticity-Consistent t statistics are reported in parentheses.

$$R(t) - RF(t) = \alpha + \beta[RM(t) - RF(t)] + sSMB(t) + hHML(t) + \varepsilon(t)$$

Panel A – Whole sample

	α	β	s	h	Adj-R2
E.W. /OLS	-0.005	1.272	0.843	-0.153	0.7937
	(-2.74)	(22.59)	(10.14)	(-1.83)	
E.W. /WLS	-0.007	1.149	0.809	-0.179	0.9219
	(-6.16)	(34.81)	(14.17)	(-2.44)	
V.W. /OLS	0.002	1.223	0.402	-0.301	0.7136
	(1.10)	(18.68)	(4.66)	(-3.31)	
V.W. /WLS	0.001	1.133	0.348	-0.314	0.8659
	(0.81)	(29.70)	(5.28)	(-4.45)	

Panel B. Debt-like portfolio

	α	β	s	h	Adj-R2
E.W. /OLS	-0.006	1.141	0.546	0.213	0.6545
	(-2.75)	(20.18)	(7.30)	(2.63)	
E.W. /WLS	-0.003	1.084	0.449	0.036	0.8339
	(-2.17)	(27.89)	(5.68)	(0.55)	
V.W. /OLS	-0.001	1.148	0.148	0.289	0.4854
	(-0.37)	(12.51)	(1.65)	(2.55)	
V.W. /WLS	0.002	1.044	0.090	-0.037	0.7343
	(1.20)	(19.08)	(1.05)	(-0.41)	

Panel C. Mixed portfolio

	α	β	s	h	Adj-R2
E.W. /OLS	-0.0001	1.289	1.009	-0.267	0.6133
	(-0.06)	(13.97)	(6.75)	(-1.85)	
E.W. /WLS	-0.008	1.174	0.886	-0.227	0.7167
	(-3.22)	(18.02)	(8.00)	(-1.88)	
V.W. /OLS	0.008	1.304	0.663	-0.775	0.5810
	(2.33)	(13.30)	(4.10)	(-4.63)	
V.W. /WLS	0.001	1.144	0.530	-0.822	0.6390
	(0.16)	(13.97)	(3.12)	(-5.01)	

Panel D. Equity-like portfolio

	α	β	s	h	Adj-R2
E.W. /OLS	-0.009	1.189	2.000	-0.923	0.5219
	(-1.46)	(5.41)	(3.39)	(-2.63)	
E.W. /WLS	-0.008	1.122	1.045	-0.405	0.9167
	(-4.06)	(15.84)	(12.15)	(-2.35)	
V.W. /OLS	-0.004	1.118	1.780	-1.082	0.4720
	(-0.60)	(5.01)	(2.90)	(-2.93)	
V.W. /WLS	-0.001	1.132	0.784	-0.694	0.7925
	(-0.11)	(12.27)	(4.68)	(-3.43)	

Table 7 - Long-run operating performance

The raw operating performances are measured by OIBD/Assets, and the abnormal operating performances are measured by subtracting the performances of the matching firms from that of the CB issuers. OIBD/Assets= Operating Income before depreciation (#13) + Interest income (#62)/ total assets (#6). Values in () under the columns of means are the statistics testing the null hypothesis that there is difference between the pre and post average operating performances using t test. The values in the columns of medians over the [-3, 3], [-3, -1], and [1, 3] years' windows are calculated as the medians of each CB issuer's average performance in the [-3, 3], [-3, -1], and [1, 3] years' windows. Values in <> are the test statistics of difference between the pre and post medians using Wilcoxon rank signed test. The z-statistic from the Wilcoxon-signed-rank test the null hypothesis of no difference in the issuers' median operating performances from pre offering period to post offering period. $z = \frac{\sum_{i=1}^{n} r_i^+ - n(n+1)/4}{\sqrt{n(n+1)(2n+1)/2}}$ ~N (0, 1) for large sample size n, where $\sum_{i=1}^{n} r_i^+ = \sum_{i=1}^{n} r_i 1(V_i^{post} > V_i^{pre})$ is the sum of the rankings r_i (by sorting $|V_i^{post} - V_i^{pre}|$ in an ascending order) when $V_i^{post} > V_i^{pre}$.

Panel A – Raw Operating Performance

	Whole sample		Debt-like		Mixed		Equity-like	
Relative year	Mean	Median	Mean	Median	Mean	Median	Mean	Median
-3	13.553	15.005	14.182	14.709	10.939	12.793	15.536	17.455
-2	12.285	14.605	15.094	14.971	8.627	12.848	13.152	16.079
-1	12.515	14.312	14.358	14.884	10.343	13.930	12.870	15.623
0	11.634	13.183	13.527	14.128	8.423	12.269	12.912	13.746
1	11.392	13.37	14.242	14.523	11.360	13.604	8.382	11.911
2	9.323	12.667	14.107	14.708	8.221	10.866	5.261	11.424
3	11.390	13.029	13.601	13.940	10.507	11.310	9.676	12.356
[-3,3]	11.651	13.141	14.114	14.194	9.727	12.343	11.249	13.525
Pre offering [-3,-1]	12.312	14.429	14.256	14.485	9.941	13.180	13.734	16.155
Post offering [1, 3]	10.559	12.271	13.988	14.207	9.539	11.441	9.186	11.649
Post - Pre	-1.753	-2.158	-0.269	-0.277	-0.401	-1.739	-4.548	-4.505
	(-2.43)	<-4.91>	(-0.42)	<-2.49>	(-0.27)	<-2.20>	(-3.14)	<-2.20>

Panel B – Abnormal Operating Performances

	Whole sample		Debt-like		Mixed		Equity-like	
Relative year	Mean	Median	Mean	Median	Mean	Median	Mean	Median
-3	-1.937	0.158	-0.545	0.402	-3.947	-2.063	-1.127	4.369
-2	-2.924	-1.214	0.151	0.070	-6.686	-3.789	-1.940	-1.424
-1	-2.721	-0.595	-0.451	-0.610	-5.139	-1.014	-2.481	0.245
0	-3.752	-1.549	-1.019	-0.622	-7.692	-3.650	-2.003	-2.784
1	-2.697	-1.742	-0.843	-1.377	-2.210	-1.315	-4.827	-4.082
2	-7.993	-2.542	-1.999	-1.255	-6.847	-4.714	-14.161	-2.540
3	-5.315	-2.415	-2.098	-1.897	-4.817	-3.256	-8.533	-6.609
[-3, 3]	-3.786	-1.939	-0.917	-1.194	-5.454	-3.312	-4.939	-0.519
Pre offering [-3,-1]	-2.639	-0.438	-0.281	-0.023	-5.294	-2.355	-1.913	0.237
Post offering [1, 3]	-5.390	-2.542	-1.443	-1.416	-5.605	-3.210	-7.158	-3.875
Post - Pre	-2.751	-2.104	-1.161	-1.394	-0.311	-0.856	-5.245	-4.112
	(-2.05)	<-4.02>	(-1.22)	<-1.93>	(-0.13)	<-2.61>	(-1.79)	<-2.26>

Panel C – Comparison between Debt-like portfolio and Equity-like portfolio

	D–E	t-stat.	P > |t|
[-3, 3] years			
Raw	2.865	-2.1995	0.07
Abnormal	4.022	-2.4559	0.03
Pre offerings [-3, -1] years			
Raw	0.522	-0.4347	0.71
Abnormal	1.632	-2.2059	0.08
Post offerings [1, 3] years			
Raw	4.802	-4.5568	0.04
Abnormal	5.716	-2.0108	0.10

Note: 1. D–E = (average operating performance of the Debt-like portfolio) – (average operating performance of the Equity-like portfolio).
2. P>\| t\| is the p value from 2 sided T-test of the null hypothesis that D-E is indifferent from 0.

Panel D-Comparison of operating performance between issuers and matching firms

diff. = (median operating performance of the CB issuers)-(median operating performance of the matching firms). The z-statistic is the test statistic of the null hypothesis that there is no difference between the issuers' and the industry matchers' median operating performance using Wilcoxon-signed-rank test.

$z = \frac{\sum_{i=1}^{n} r_i^+ - n(n+1)/4}{\sqrt{n(n+1)(2n+1)/2}}$ ~ N (0,1) for large sample size n, where $\sum_{i=1}^{n} r_i^+ = \sum_{i=1}^{n} r_i 1(V_i^{issuer} - V_i^{match})$, is the sum of the rankings r_i (by sorting $|V_i^{issuer} - V_i^{match}|$ in an ascending order) when $V_i^{issuer} > V_i^{match}$.

	Whole sample		Debt-like		Mixed		Equity-like	
Relative year	*diff.*	z- stat.	*diff.*	z- stat.	*diff.*	z-stat.	*diff.*	z- stat.
-3	0.158	-0.40	0.402	-0.57	-2.063	-0.52	4.369	-0.04
-2	-1.214	-1.00	0.070	0.15	-3.789	-1.72	-1.424	-0.11
-1	-0.595	-1.52	-0.610	-0.46	-1.014	-1.25	0.245	-0.53
0	-1.549	-3.18	-0.622	-0.79	-3.650	-2.71	-2.784	-1.29
1	-1.742	-2.40	-1.377	-0.83	-1.315	-0.72	-4.082	-1.78
2	-2.542	-3.47	-1.255	-1.23	-4.714	-1.94	-2.540	-2.17
3	-2.415	-3.58	-1.897	-1.05	-3.256	-1.95	-6.609	-2.53

Table 8 - Long-run equity risks

Panel A- Pre and post offerings comparison of equity risks

Under the columns of means, the values reported in ( ) are t-statistics using T-test for the null hypothesis of no difference between the pre offering and post offering average risks. Under the columns of medians, the values reported in <> are z-statistics using Wilcoxon signed rank test for the null hypothesis of no difference between the pre offering and post offering median risks.

	Whole sample		Debt-like		Mixed		Equity-like	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Equity beta								
[-3,3]	1.012	0.975	0.926	0.893	1.065	1.051	1.088	1.012
Pre offering [-3,0]	1.043	1.000	0.954	0.895	1.100	1.056	1.118	1.045
Post offering [0,3]	0.981	0.921	0.896	0.867	1.029	1.013	1.061	1.023
Post-pre	-0.062	-0.079	-0.059	-0.028	-0.071	-0.042	-0.058	-0.022
	(-2.44)	<-2.68>	(-2.02)	<-2.07>	(-1.20)	<-0.65>	(-1.21)	<-1.90>
Residual variance								
[-3,3]	0.114	0.077	0.056	0.043	0.141	0.101	0.140	0.101
Pre offering [-3,0]	0.096	0.067	0.051	0.040	0.120	0.086	0.115	0.090
Post offering [0,3]	0.131	0.074	0.061	0.043	0.163	0.087	0.162	0.098
Post-pre	0.035	0.007	0.010	0.003	0.042	0.001	0.048	0.008
	(4.85)	<3.32>	(2.46)	<1.78>	(2.50)	<0.47>	(3.55)	<2.92>
Total risk								
[-3,3]	0.126	0.088	0.064	0.050	0.155	0.110	0.156	0.118
Pre offering [-3,0]	0.107	0.078	0.059	0.049	0.132	0.099	0.132	0.098
Post offering [0,3]	0.144	0.085	0.069	0.050	0.178	0.099	0.178	0.117
Post-pre	0.037	0.007	0.010	0.001	0.047	-0.001	0.046	0.018
	(4.87)	<3.84>	(2.48)	<1.64>	(2.63)	<0.82>	(3.26)	<3.32>

Panel B- Comparison of equity risks with non-issuing matching firms

The values reported are the mean and median of the abnormal risks (risks of the CB issuers – risks of the matching firms). The values reported under the columns of means are t-statistics from T-test of the null hypothesis of no difference in average risks between the issuers and the matching firms. The values reported under the columns of medians are z-statistics from Wilcoxon-signed-rank test.

	Whole Sample		Debt-like		Mixed		Equity-like	
Relative day	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Equity Beta								
[-756, -504)	0.115	0.115	-0.002	0.029	0.078	0.068	0.363	0.315
	(-1.18)	<1.48>	(-0.58)	<-0.32>	(-0.06)	<0.25>	(-3.54)	<3.40>
[-504, -252)	0.147	0.135	0.043	0.037	0.182	0.138	0.281	0.321
	(-3.33)	<3.34>	(-0.04)	<0.00>	(-2.08)	<2.20>	(-3.13)	<3.48>
[-252, 0)	0.208	0.272	0.07	0.167	0.277	0.383	0.349	0.334
	(-4.62)	<5.63>	(-0.66)	<1.43>	(-3.20)	<4.15>	(-3.62)	<3.77>
(0, 252]	0.289	0.301	0.148	0.173	0.37	0.369	0.404	0.43
	(-7.54)	<7.37>	(-2.07)	<2.45>	(-5.14)	<4.75>	(-6.28)	<5.65>
(252, 504]	0.224	0.221	(0.04)	0.031	0.335	0.369	0.341	0.357
	(-4.63)	<4.97>	(-0.02)	<0.67>	(-4.32)	<4.04>	(-3.30)	<3.57>
(504, 756]	0.121	0.257	-0.011	0.098	0.178	0.452	0.227	0.318
	(-3.73)	<3.64>	(-0.59)	<-0.32>	(-2.80)	<2.62>	(-3.48)	<3.45>
Residual Variance								
[-756, -504)	0.000	0.004	-0.014	-0.002	0.011	0.011	0.007	0.012
	(-0.20)	<-0.25>	(-3.02)	<-2.56>	(-0.40)	<0.35>	(-1.78)	<1.94>
[-504, -252)	-0.019	0.001	-0.016	-0.002	-0.017	0.002	-0.021	0.009
	(-2.41)	<-0.77>	(-3.53)	<-3.11>	(-1.40)	<0.42>	(-0.07)	<1.17>
[-252, 0)	-0.023	-0.003	-0.027	-0.006	-0.038	0.005	-0.021	0.009
	(-3.45)	<-1.83>	(-3.54)	<-3.63>	(-1.96)	<0.23>	(-0.63)	<0.54>
(0, 252]	-0.035	-0.011	-0.048	-0.016	-0.027	0.005	-0.021	-0.019
	(-3.64)	<-4.16>	(-3.52)	<-4.61>	(-1.41)	<-0.56>	(-0.89)	<-1.08>
(252, 504]	-0.021	0.000	-0.046	-0.015	-0.005	0.017	-0.015	-0.012
	(-1.68)	<-1.37>	(-3.08)	<-3.76>	(-0.36)	<1.26>	(-0.43)	<-0.57>
(504, 756]	-0.011	-0.004	-0.045	-0.009	0.048	0.008	-0.038	-0.011
	(-0.21)	<0.05>	(-2.13)	<-2.60>	(-1.13)	<1.46>	(-0.27)	<0.41>
Total Risk								
[-756, -504)	0.000	0.003	-0.016	-0.004	0.01	0.012	0.011	0.013
	(-0.21)	<-0.10>	(-3.06)	<-2.52>	(-0.38)	<0.59>	(-2.04)	<2.10>
[-504, -252)	-0.012	0.006	-0.016	-0.001	-0.035	0.004	-0.005	0.01
	(-1.28)	<-0.27>	(-3.42)	<-2.99>	(-1.30)	<0.68>	(-0.98)	<1.59>
[-252, 0)	-0.02	0.000	-0.026	-0.007	-0.015	0.017	-0.017	0.012
	(-3.11)	<-1.24>	(-3.48)	<-3.25>	(-1.79)	<0.44>	(-0.26)	<1.00>
(0, 252]	-0.03	-0.013	-0.047	-0.015	-0.02	0.007	-0.013	-0.009
	(-3.25)	<-3.16>	(-3.41)	<-4.32>	(-1.19)	<-0.18>	(-0.49)	<-0.16>
(252, 504]	-0.017	0.003	-0.047	-0.013	0.002	0.019	-0.01	-0.016
	(-1.31)	<-0.88>	(-3.07)	<-3.62>	(-0.64)	<1.52>	(-0.09)	<-0.20>
(504, 756]	-0.007	-0.004	-0.044	-0.007	0.058	0.011	-0.035	-0.006
	(-0.27)	<0.38>	(-2.10)	<-2.37>	(-1.18)	<1.63>	(-0.30)	<0.61>

Panel C- Comparison of equity risks between Debt-like portfolio and Equity-like portfolio

	D-E	t -stat.	P > |t|
[-3, 3] years			
Equity Beta (systematic risk)	-0.162	-5.8	<.0001
Residual variance(idiosyncratic risk)	-0.084	-11.63	<.0001
Total equity risk	-0.093	-12.2	<.0001
Pre offerings [-3, 0] years			
Equity Beta (systematic risk)	-0.164	-3.86	0.0001
Residual variance(idiosyncratic risk)	-0.064	-12.27	<.0001
Total equity risk	-0.073	-10.86	<.0001
Post offerings [0, 3] years			
Equity Beta (systematic risk)	-0.165	-4.48	<.0001
Residual variance(idiosyncratic risk)	-0.102	-7.86	<.0001
Total equity risk	-0.109	-8.34	<.0001

Note: D–E = (average risk of Debt-like portfolio)- (average risk of Equity-like portfolio). P>|t| is the p value from 2 sided T-test of the null hypothesis that D–E is indifferent from 0.

Table 9 - Announcement Effect and Post-offering Long-run Performances

Constant	Operating performance	Equity beta	Residual variance	Total Risk	Adj-R2	Number of obs.
-0.0292	0.0004				0.0095	372
(-6.99)	(2.45)					
-0.0226		-0.0017			-0.0015	601
(-4.47)		(-0.39)				
-0.0203			-0.0289		0.0054	601
(-6.04)			(-1.42)			
-0.0200				-0.0282	0.0056	601
(-5.78)				(-1.44)		
-0.0259	0.0004	-0.0023	-0.0065		0.0047	372
(-3.36)	(2.53)	(-0.39)	(-0.36)			
-0.0285	0.0004			-0.0041	0.0070	372
(-7.01)	(2.51)			(-0.27)		

Note: The dependent variable is the short-run announcement effect, measured by CAR (-2, 2). White (1980) heteroskedasticity consistent t statistics are reported in parentheses below the estimated OLS coefficients.