Why do companies issue convertible bonds? A review of theory and empirical evidence

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Abstract

The literature on the motives for the issuance of convertible debt is reviewed. This literature shows a large discrepancy between theory and practice. Surveys show that managers base their motives for the use of convertible debt on factors that are irrational according to the theoretical literature. This theoretical literature in turn offers a number of rational motives. These motives are based on the resolution of the problems of informational asymmetry and agency costs, on tax motivations and managerial entrenchment arguments. Most of the rational motives have been investigated in the cross-sectional studies, which offer general support to at least some of them. However, the survey studies find very little to no support for the rational motives. This might be due to either the sensitivity of the surveys to the question contents, to the use of weak proxies in the cross-sectional studies, or a combination of these. In our view, future research in this field should aim for an approach that combines the use of survey data and cross-sectional analysis. We believe that such an approach may bridge the gap between theory and practice.

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1 INTRODUCTION

Exchange-listed companies have a wide range of possibilities when they look for new sources of financing. Companies can use equity in the form of internally generated funds or issue new shares of common stock. Alternatively, they can use debt in the form of bank loans or issue bonds. The use of hybrid securities represents yet another possibility. The most well-known hybrid securities are so-called convertible bonds which, at the option of the holder, can be exchanged into shares of common stock of the issuing company. An example of a convertible bond issue is the bond issue by General Motors Corporation in 2003. These bonds pay an annual coupon of 6.25 percent. Furthermore, on their maturity date, the holder of the bond has the option to choose between receiving the nominal value in cash or converting the bond into 21 shares of the General Motors Corporation stock.[4] Convertible bonds possess characteristics of both equity and debt: they resemble debt, because they pay a fixed coupon interest. On the other hand they resemble equity, because part of the price that is paid for them is for the option to exchange the bonds into shares. The money paid for the option does not have to be paid back by the company, irrespective of future developments of the stock price.

An interesting question is what motivates companies to issue a hybrid security like a convertible bond instead of issuing straight debt or equity. Ross, Westerfield, and Jaffe (2005, page 686) state that "*probably there is no other area of corporate finance where real-world practitioners get as confused as they do on the reasons for issuing convertible debt.*" The authors observe that practitioners generally argue that convertible bonds offer the possibility to issue equity at a higher price than the currently prevailing stock price and/or that they offer a possibility to attract debt at a low interest rate. The argument that equity can be attracted at a higher price than the stock price at the issuance date of the convertibles is based on the fact that the conversion price is generally higher than the current stock price. The conversion price is the price for which the holders of the convertible bonds can buy stocks. In the General Motors example the conversion price is $47.62.[5] The conversion price is higher than the stock price at the issuance date of the convertibles, which was $35.94. The second argument that convertibles offer a possibility to attract debt at a low interest rate is based on the fact that the coupon rate on the convertibles is lower than the coupon rate a company would have to pay on ordinary debt. In the General Motors example, the company pays a coupon of 6.25 percent on the convertible bonds, while the closest comparable straight bond of the same company had a yield to maturity of around 7.5 percent. However, both these claims are refuted by academics who argue that the conversion price should not be compared to the current stock price, and hence reject the first argument. They also reject the second argument, explaining that the lower coupon interest on convertible bonds is caused by the

[4] The data on these convertible bonds is taken from the SDC database on new issues.
[5] This is the nominal value of the bonds divided by the conversion ratio. The conversion ratio is the number of shares that is acquired when the bonds are converted. In this example it is 21. This leads to a conversion price of 1,000/21 = $47.62.

fact that the holder of a convertible gets the option to buy stock in the future. Since an option is a right and not an obligation, this option has a value, which is paid for by the holder of the convertible by accepting a lower interest rate.

Academic theories in corporate finance concerning the question why companies issue convertible debt are generally based on agency and asymmetric information models. However, surveys among managers responsible for the decision to issue convertibles generally show very little support for these theories. This shows that there is a large divergence between the practitioner's and the academic literature on the question why companies issue convertible bonds. The objective of this paper is to review the different viewpoints and to see where theory and practice agree, and where the large disagreement lies.

Before going into the question why companies issue convertible bonds, it is useful to give a short overview of the market for these financial instruments. The size of the market for convertible debt varies between the countries considerably, with the U.S. market being the single largest market for convertible bonds in the world, accounting for 30 percent of all the convertible bond issues in the period 1990-2003, as shown in Table 1. The U.S. market is followed by Japan, South Korea and Canada, while the largest Western European markets account only for somewhat more than 9 percent of the total global issues.

<Insert Table 1 here>

With respect to the popularity of the convertible bonds over time, Table 2 shows that globally there are no large variations in the number of issues over time. However, there is an increased popularity of convertible debt between 1993 and 1999 in terms of the number of convertible bond issues, which can again be observed in 2003.

<Insert Table 2 here>

Another interesting difference among different markets is the issue size. As shown in Table 3, the largest issue sizes, measured in mean and median values, are in the Western European markets, while the smallest are in South Korea and Australia. The largest variations, measured with the coefficient of variation, are in the German and South Korean market, while the smallest can be observed in Taiwan[6].

<Insert Table 3 here>

[6] Note that the number of issues in Table 3 can be different than the reported number of issues in Table 2. This is due to missing information on issue sizes for some of the issuers in the SDC database.

As mentioned before, the objective of this paper is to overview the theory and empirics on the question why companies issue convertible bonds. This question is very relevant in practice, because convertible bonds are not only frequently used by large exchange-listed companies, but also by young companies that use venture capital. By answering the question why companies issue convertible bonds we can also shed more light on the question why companies issue other hybrid financial instruments. These hybrids include convertible preferred stock and warrant-bond loans among others. Convertible preferred stock is preferred stock with an option for the holder to convert it into common stock. A warrant-bond loan is a loan with warrants attached. The most important difference between warrant-bonds and convertible bonds is that the warrants in a warrant-bond loan can be detached from the bonds after the issuance. We will not go into the choice that companies can make between different hybrid financial instruments.

A related topic that will shortly be mentioned is that of the call policy of convertible bonds. Convertible bonds are usually callable, which means that the company has a right to call the bonds, and to repay the investor before maturity or conversion. Ingersoll (1977) demonstrates that the optimal moment to call a convertible is when the conversion value equals the call price. The conversion value is the value of the common stock to be received in the conversion exchange. However, in an empirical study he finds that in practice the calls show a delay. On average the conversion value of the bonds is 43.9 percent above the call price. This finding of Ingersoll has led to a large amount of academic papers on the question why convertible bonds are called late. Given that this is only a side issue in the decision to issue convertible bonds, we will not discuss this topic further.

The paper is structured as follows. In Section 2 we review the theoretical arguments for the issuance of convertible debt. Section 3 is dedicated to a review of empirical evidence, based on different types of empirical studies: event studies, cross-sectional analyses and surveys. Section 4 concludes the paper.

2 THEORETICAL MOTIVATIONS FOR THE USE OF CONVERTIBLE DEBT

2.1 Capital Structure Irrelevance and Security Choice

In their seminal work on capital structure (ir)relevance Modigliani and Miller (1958) show that the way a firm finances its investments does not matter for the market value of the firm. It is irrelevant whether companies choose to issue equity, straight debt, convertible bond or any other package of

securities to finance their investments. Why do investors then in terms of underlying equity valuation of the company react differently to the issue announcements of different types of securities[7]?

Modigliani and Miller build their model based on the assumptions of perfect capital markets[8] and those of perfectly informed agents who trade securities, who share similar information (symmetric knowledge) and are of equal (atomic) size. Their model, although shown not to hold in reality, provides the cornerstone of the capital structure research framework. Perhaps the most crucial assumption is the one about symmetric information and perfect knowledge of the agents. This assumption has inspired numerous later strains of literature. In reality agents posses different information, contracts cannot be written such to cover for all possible contingencies that might arise and many actions of agents are not observable and / or verifiable. We can describe such a setting with the notion of an asymmetric information framework. In such a setting efficient transmission of funds (contracts) between parties is impaired and can, in the worst case, lead to a complete market collapse (see Akerlof 1970). The main reasons are adverse selection and agency problems.

The adverse selection problem results in ex-ante unobservable and / or unverifiable type of agents that the other party (principal) in the contract has to choose or determine. The agency problem is a result of ex-post possible opportunistic behavior of an agent, once the contract has been made, but the actions of the agent are unverifiable and contracts do not cover all possible contingencies. In a financing arrangement (contract) between a firm (agent) and an investor (principal) all these issues play crucial roles and the severity of the adverse selection and the agency problem affects the efficiency of a firm's financing. The worse the adverse selection and agency problems are, the less efficient the financing channel will be, since a first best solution cannot be achieved. A first best solution is the outcome under no adverse selection and agency problems. Put differently, the financing will become more expensive for the firms, because principals cannot differentiate between the agents properly, since bad types can mimic good types. This drives out some positive net present value investment opportunities (Myers and Majluf 1984) and creates a social dead weight loss, since a first best solution is not implemented. Good type agents thus try to send signals to the principals about their true types in order to differentiate themselves and overcome this issue. In such setting the capital structure, or the way a firm finances itself, is considered to be a signaling device (Heinkel 1982), but above all the security types that compose the capital structure are considered to be a signaling mechanism (Myers and Majluf 1984).

Producing a signal has to be costly in order to be perceived as credible. In other words, only the agents that can afford to produce the signal (good types) will do so, while bad types will not mimic them, as

[7] For the empirical evidence on wealth effects associated with announcements of different securities see Section 3.
[8] No frictions and discriminating taxes among others.

the cost of the signal would exceed the benefit (higher valuation for example) of representing themselves as good types. Otherwise, the signal can be sent by anyone and types cannot be correctly inferred. For example, a bad type firm will not issue debt, since that increases the probability of the financial distress much more than for a good type firm. In that respect, a capital structure or a degree of leverage can serve as a credible signal of the firm type. Similar is the case of different types of security issues, where there is an equity issue on one end of the spectrum and a straight debt issue on the other. The paradox of both security types is their incompatibility. Namely, equity ownership induces risk taking, due to limited liability. The most an investor can lose are the funds invested, while the upper potential for gains is unlimited[9]. Debt ownership on the other hand induces risk aversion, since the most debtholders can gain is the principal and a fixed return. Debtholders are not compensated for additional risk being undertaken by the firm and are therefore faced with a concave payoff function. In the case of the firm's default on debt, when the realized cash flow of the firm is less than the principal, debtholders receive any cash flow from the firm. In the case where the realized cash flow of the firm is greater than the principal, debtholders receive only the principal and do not participate on any gains above that value. As mentioned in the introduction, convertible bonds are hybrid instruments, which combine features of straight debt and equity. They are straight debt packaged with a call option on the firm's equity, making it possible for convertible bondholders to participate in potential value gain sharing of the firm.

2.2 Theoretical Motivations for issuing Convertible Debt

There are number of different theoretical explanations as to why companies finance themselves with convertibles. These can be classified into several broader categories:

- Theories based on an asymmetric information framework (Brennan and Kraus 1987, Brennan and Schwartz 1988, Kim 1990 and Stein 1992).
- Theories based on an agency problem framework (Green 1984, Mayers 1998 and Isagawa 2000).
- Tax advantage based theories (Jalan and Barone-Adesi 1995).
- Theories based on managerial entrenchment (Isagawa 2002).
- Rationing in the equity market (Lewis, Rogalski and Seward 2001).

The theoretical explanations show an important distinction between adverse selection models and agency theories on one hand, and the entrenchment theories on the other. The distinction is in the underlying assumptions about the control over financial and investment policies. Adverse selection models and agency theories solve for specific asymmetric information and agency issues between

[9] This creates a convex payoff function.

insiders (managers and/or existing shareholders) and outsiders (either new shareholders or bondholders) and assume maximization of the existing shareholder's wealth (in the literature also referred to as the efficient approach). The entrenchment approach on the other hand assumes that financial and investment policies are determined by the entrenched manager (insider), who serves his or her own interests (empire building and different perks among other) and does not necessarily pursue value maximization of the firm.

2.2.1 Theories based on the Asymmetric Information Framework

According to Brennan and Kraus (1987) convertible debt can costlessly mitigate investment inefficiencies, which arise due to information asymmetry issues in the framework of Myers and Majluf (1984) and Heinkel (1982). The information asymmetry can either concern the uncertainty regarding returns on investments made by firms (mean of the distribution of returns) or the uncertainty regarding the variance of returns (mean-preserving spread). Brennan and Kraus develop such a single parameter model of information asymmetry. The goal of the firm is to maximize the difference between the value of the funds, obtained from the investors, and a true value of the financing, given the full information about the firm. In the equilibrium each financing strategy[10] is chosen by the worst possible type of firm for that particular financing strategy (this is the so-called "lemons property"). Securities that can lead to such equilibrium include convertible bonds, junior bonds, and bonds with warrants. These securities can effectively resolve the issue of adverse selection, as each type of firm reveals itself with the choice of the financing strategy. The strategy depends on the nature of the information asymmetry problem.

Brennan and Schwartz (1988) argue that the only reason investors are willing to pay more for a convertible bond than for a straight bond is because of its hybrid nature. The cost of convertibles is evaluated on a weighted basis of the straight debt component cost of convertibles and the equity option cost of a convertible. Convertible bonds are relatively insensitive to the risk of the issuing company exactly because of their hybrid nature. Namely, higher risk reduces the value of the straight debt component, but at the same time it increases the value of the equity option component, thus having very limited overall effect on the value of convertibles. Brennan and Schwartz (1988: 59) point out that the relevant risk is *"…not only the risk of the company's existing operations, but also the risk of any future operations in which the firm may become involved over the life of the bond."* This relates to the agency cost of straight debt. It arises from the different payoff structures of bondholders and shareholders, and limited liability of shareholders (Jensen and Meckling 1976). With straight debt

[10] Note that Brennan and Kraus make a distinction between securities and financing. They consider securities "*to be basic claims traded in the capital markets*", while financing in their terminology refers "*to the complete set of financial decisions by a firm at a point in time*".

outstanding, shareholders[11] have strong incentives to increase the risk of the company, which increases the upper potential for gains of shareholders, but reduces the value of straight debt. Convertibles reduce these incentives, as their value is less sensitive to the changes in the riskiness of the underlying equity[12]. Brennan and Schwartz (1988: 59) conclude that *"…convertibles are most likely to be used by companies which the market perceives as risky, whose risk is hard to assess and whose payment policy is hard to predict."*

Constantinides and Grundy (1989) present a model in which an issue of a convertible bond, combined with a partial share repurchase, serves as a credible signal of a firm type. This resolves the information asymmetry problem and related underinvestment issue, when the firm is restricted to equity financing. Since the management owns a fraction of the stock in an all-equity firm, they are interested in maximizing the value of the firm's stock. Management may not sell their stock or buy the securities issued by the firm. Constantinides and Grundy show that in the fully revealing equilibrium the payoff of the issued security has to be similar to the payoff of straight debt (concave payoff function) for the low values of the firm's investments. On the other hand, for the high values of the firm's investments, payoff of the issued security should be similar to the payoff of equity (convex payoff function). Constantinides and Grundy argue that such payoff structure of the security assures the proper signaling incentives for the management (costly signaling). As previously discussed, a convertible bond is a security that conforms to these requirements.

Similarly, in the model of Kim (1990) the convertible bond issue and in particular the conversion ratio serve as a signal of firm's type. The conversion ratio serves as a credible signal of a company's future earnings. In the equilibrium, lower expected future earnings of the worse types induce higher conversion ratios. These imply more shares per bond and thus higher dilution of future earnings, as those have to be shared with a relatively larger share of new shareholders. The model yields a testable hypothesis that abnormal common stock returns at the announcements of the convertible debt issues are negatively related to the conversion ratio, since higher conversion ratios imply worse type firms.

According to Stein (1992) firms issue convertible bonds in order to get equity through the "back door" in situations where informational asymmetries make conventional equity issues unattractive due to high issue costs and dilution (Myers and Majluf 1984). Stein's rationale resembles that of Constantinides and Grundy (1989), but has a different empirical implication. In the model of Constantinides and Grundy the share repurchase mechanism is a way of signaling type of the firm to the market. This is not the case in Stein's model, where two factors are particularly important: call

[11] Here, we can also think of the management that acts in the interests of shareholders, if we set aside the agency costs of equity.
[12] Note that this second argument of Brennan and Schwartz should essentially be classified in the moral hazard framework.

features of convertibles bonds and increased possibility of financial distress due to excess debt. In a fully separating equilibrium good firms issue debt, medium quality firms issue convertible debt and bad quality firms issue equity. Financing choice therefore serves as the signal to the market. Announcement effects, which are generally found to be negative for all kinds of security type issues, are according to Stein's model expected to be worst for equity offerings, somewhat better for convertible debt issues and the least negative for straight debt issues. These expectations are in line with the adverse selection models of a capital structure.

2.2.2 Theories based on the Agency Problem Framework

Maximizing the value of the equity claim and maximizing the value of the firm can, with risky debt outstanding, lead to agency problems (debtholder expropriation). Shareholders have an incentive to substitute projects of lower risk with riskier projects. This is due to their limited liability. Green (1984) develops a model in which option claims issued with debt may mitigate those incentive problems. By addressing the financing and incentive problems simultaneously, the correct incentives can be induced with a convertible bond or debt-warrant combination. This alters the incentives of the equity holders to take risk, as part of the potential gains has to be shared with new shareholders, since option claims on company's equity are issued together with debt. However, Green's analysis abstracts from a number of other incentive (agency) problems, where the most important is the one between management and shareholders. Therefore, the model does not eliminate all the agency costs. The crucial characteristic of convertible and warrant bonds is sharing of the upper potential of the equity gains, while there must be the lower bound of the gains, for which the fixed claim on the debt is paid (the option is not exercised). Only then will such instruments have the desired effect on incentives.

The model of Mayers (1998) is very close to that of Stein (1992), but is different in spirit, since Stein's model is based on asymmetric information about assets in place, whereas Mayers's sequential financing hypothesis is based on the uncertainty about the value of future investment options. In Stein's model the convertibility feature solves the financing problem at the time of the issue, whereas in Mayers' model convertibility solves a future financing problem. Compared to straight bonds convertible bonds economize on issue costs, because they leave funds in the firm (convertibility feature) and reduce the leverage when the investment option is valuable. On the other hand convertibles control the overinvestment problem (see Jensen 1986) when the investment option is not valuable. The call provision is an important feature of convertible bonds, when there is uncertainty about the maturity date of the investment option. Mayers notes that existing evidence on convertible bonds supports the sequential financing hypothesis, but that much of it is also consistent with other theories, since (Mayers 1998: 88) *"…investment options provide opportunities for risk-shifting or are a likely source of asymmetric information."* The sequential financing hypothesis has no direct implication for stock price reactions at the time of convertible debt announcements. However, as none

of the other motivations for the use of convertible debt predicts any additional investment at the time of conversion, evidence of investment related activity at the time of conversion would support the sequential-financing hypothesis.

In the model of Isagawa (2000) the managerial investment decisions are affected through default risk rather than financing constraints as in Mayers' model. In cases, where managers have empire-building tendencies[13] and fear of default[14], properly structured convertible debt alleviates managerial opportunism. In essence, the model does not depend on the informational asymmetry problem and thus does not have any testable hypothesis regarding stock price reaction following convertible debt offer announcements.

2.2.3 Tax Advantage based Theories

Jalan and Barone-Adesi (1995) consider convertible bonds as delayed equity financing and motivate their use with a different tax treatment of coupon interest and dividend payments in a setting with market frictions and incompleteness. In such a setting issuing convertible bonds increases the residual equity value of the firm, since the firm benefits from the tax shield as opposed to an up-front equity financing. Cooperation between firms and investors and the fact that firms have repeated need to tap into the financial markets assure that both firms and investors have an incentive to use convertibles and share their benefits. Compared to straight debt, convertible bonds offer much less trade-off between interest tax shields and cost of financial distress. In the case of straight bonds higher interest tax shields are only achievable trough higher indebtedness, which increases the probability of financial distress. On the other hand, convertible bonds offer the benefit of the interest tax shields, but do not increase the probability of financial distress as much. Empirical evidence shows that firms tend to delay calls of convertibles, even though this goes against rational explanation (Brennan and Schwartz 1988). This fact seems to support the tax motivation. By delaying the call, firms leave more benefits to convertible bondholders, thus cooperating in the continuous game, where they repeatedly have to go back to the market for financing. Should they fail to cooperate and share tax benefits with the investors, they would not be able to issue new convertibles and exploit the tax benefits.

2.2.4 Theories based on Managerial Entrenchment

Isagawa (2002) analyzes the use of convertible bonds in a setting, where an entrenched manager determines the financial policy of the firm. This model is a deviation from the other literature, which mostly assumes that corporate financial policy is chosen such that it maximizes shareholder's wealth. Isagawa builds on the work of Zwiebel (1996) in which the management chooses financial policy

[13] This relates to the so-called overinvestment problem related to free cash flow. See Jensen (1986).
[14] This relates to the so-called underinvestment problem related to debt. See Myers (1977).

based on its own interests. The interests are best served if management remains in control of the firm and undertakes any expansion project (empire building). In the absence of the market for corporate control managers have no incentives to issue debt, since that increases the probability of bankruptcy (and loss of their position). With the existence of the market for corporate control, the manager will issue debt in order to fence the takeover. By doing that and distributing cash dividends, managers can commit not to undertake value-decreasing projects. This, according to Zwiebel, explains why managers would choose to issue debt. When there are no other financing instruments, managers issue straight debt, which increases a probability of bankruptcy, and undertake the value-increasing project. By issuing callable convertible debt instead, managers can reduce the probability of bankruptcy. This implicitly assumes that bonds will eventually be converted into equity. A callable convertible bond is thus an effective financial instrument for an entrenched manager, but it is not desirable from the standpoint of the value of a firm. In this model the firm value decreases, since the probability of an inefficient manager being replaced decreases. Isagawa (2002: 266) concludes that *"…this implies that corporate financial policy itself creates a conflict between the objectives of the management and the owners…"*.

2.2.5 Rationing in the Equity Markets

Lewis, Rogalski, and Seward (2001) propose an alternative explanation for the issuance of convertible debt. Their model is in the spirit of the explanation of the rationing in debt markets (see Stiglitz and Weiss 1981). Lewis *et al* argue that there may be cases in which issuers want to issue common stock, but the firm's participation in the equity market is hampered. In case of rationing in debt markets, there is no alternative to raising debt, since straight debt is the most senior security. In case of equity, which is the most junior security, rationing may not necessarily exclude the firm from raising funds with a more senior security such is for example convertible debt.

3 EMPIRICAL RESEARCH

3.1 Wealth Effects associated with Convertible Debt offering announcements

It is empirically well documented and consistent with the model of Myers and Majluf (1984) that different security types induce different wealth effects at the time of their announcements. Seasoned equity offerings induce the strongest negative wealth effects[15] of between -2.5 and -4.5 percent for the U.S. market, while straight debt issues induce only slightly (many times insignificant) negative wealth

[15] See for example Masulis and Korwar (1986), Mikkelson and Partch (1986) and Asquith and Mullins (1986).

effects[16]. In Table 4 it is shown that convertible debt offerings induce announcement date valuation responses that are between those for equity and straight debt. Using the results of the previous empirical U.S. studies, we have computed the weighted[17] average wealth effect associated with the convertible debt issue announcements in the U.S. market of -1.63 percent, while the results of individual U.S. studies vary between -0.6 and -3 percent.

<Insert Table 4 here>

However, the results for the wealth effects associated with the announcements of convertible debt offerings differ across countries and periods. Contrary to studies conducted in the U.S. market, Kang and Stulz (1996) find significant positive abnormal returns in the Japanese market and attribute those to deregulation in Japan during their sample period and different behavior of Japanese managers, who seem to be less concerned about short-term results than their American counterparts. Similarly to Kang and Stulz, the abnormal returns associated with convertible debt offerings documented by Christensen, Faria, Kwok and Bremer (1996) in the Japanese market are positive, but insignificant. This is also the only difference they observe between the U.S. and the Japanese market in terms of abnormal stock price reactions to announcements of different securities, but they offer no clear explanation. De Roon and Veld (1998) also find positive abnormal returns for convertible offering announcements in the Dutch market. They do not find support for the notion that differences in corporate governance structures cause the difference in abnormal returns. In a study of the Taiwanese convertible bond market Chang, Chen and Liu (2004) find differences in the wealth effects between the first time issuers and seasoned convertible debt offerings, where the wealth effects are significantly positive for the first and negative (but insignificant) for the latter. They suspect that deregulation (similarly as in Japan) could account for the difference, where relaxed criteria for issuance of convertible bonds leads to the issue announcements being interpreted as a signal of the firm becoming more independent from bank financing (Kang and Stulz 1996).

Apart from country and period specific differences in studies, most of the variation in the size of the wealth effects is attributable to issuer and issue specific factors due to the hybrid nature of convertible debt. More specifically, convertible debt can be structured such that it is either more equity- or more debt-like, by adjusting the characteristics of the issue. These include conversion price, maturity and call protection period among others. Typically, convertibles with shorter maturities or call protection periods and lower conversion prices are more likely to be in the money sooner and be converted into equity, which makes them more equity-like. Longer maturities or call protection periods and high conversion prices are characteristics, which make a convertible issue more debt-like. This effectively

[16] See for example Dann and Mikkelson (1984) and Eckbo (1986).
[17] The weights are sample sizes of the U.S. studies.

provides an important measure. First, by estimating whether the issue is more equity- or more debt-like, it is possible to capture an important explanation for the different size of the wealth effect associated with the announcement of a convertible debt issue. Second, it gives a useful test for the theoretical motives behind issues of convertibles. Almost all researchers agree to the following reasoning. Cases, where most of the convertibles are indeed more debt-like, suggest that convertibles are structured such as to resolve issues mostly associated with substitutions for straight debt (risk-shifting hypothesis of Green 1984, risk estimation of Brennan and Schwartz 1988 and Brennan and Kraus 1987). On the other hand, if the convertibles are more equity-like, this could be interpreted as support for delayed equity and signaling motives (relating to theories of Stein 1992 and Kim 1990). Although the reasoning that convertible bonds are a substitute for either debt or equity seems straightforward, it could be the case that they are neither or perhaps something else, which so far has not been theoretically proposed. This is also the most important point that future empirical research should address. The structure of the convertible debt issue on the other hand does not have any direct implication for the sequential financing model of Mayers (1998) and Isagawa's idea behind the control of managerial opportunism (2000) and managerial entrenchment (2002).

For the measurement of the size of the equity component in a particular convertible debt issue, different authors propose several measures, which are summarized in Burlacu (2000). The measure mainly used in the most recent literature is the so-called delta[18] (see Burlacu 2000 and Dutordoir and Van de Gucht 2004). The delta measure relates to the price sensitivity of a convertible bond to the underlying equity, and takes values between 0 and 1. A value closer to 1 indicates that the sensitivity of convertible bond price with respect to changes in the price of underlying equity is high, which makes the convertible bond more equity-like. Therefore, we expect that more debt-like offerings of convertible bonds are associated with less negative abnormal returns and more equity-like offerings with more negative abnormal returns. Indeed, all the studies using the delta measure to determine the characteristic of the convertible bond issue find that issues with higher delta value induce more negative wealth effects. This is consistent with the more equity-like nature of such issues.

[18] Under standard Black-Scholes assumptions for the probability of conversion (option being in-the-money), the delta measure is computed as:

$$\Delta = e^{-\delta T} \cdot N\left[\frac{\left(\ln\left(\frac{S}{X}\right)+\left(r-\delta+\frac{\sigma^2}{2}\right)\cdot T\right)}{\sigma\cdot\sqrt{T}}\right]$$

Where S is the current price of the underlying stock, X is the conversion price, δ is the continuously compounded dividend yield, r is the continuously compounded yield on a selected "risk-free" bond, σ is the annualized stock return volatility, T is the initial maturity of the bond and N(.) is cumulative normal probability distribution.

3.2 Convertible Debt Structure and Empirical Tests of Theoretical Motives

Stein (1992) finds support for his model in managerial motives, since in the earlier survey research most managers state that convertible debt is issued in the function of "delayed equity". The surveys do not support the implications of the signaling model of Constantinides and Grundy (1989), since no firm in the surveys uses the proceeds to repurchase stock. They rather use the proceeds for capital expenditures, general corporate spending and debt refinancing. Empirical evidence (Essig 1991) suggests that high debt-to-equity ratio firms, firms with high informational asymmetries and high growth potential are significantly more likely to use issue convertible debt. Call provisions seem to be crucial, since most of the firms force conversion in a short time after the issue date or call protection expiration. Mikkelson and Partch (1986) document that convertible bond issues with high bond ratings (A and above) have very negative wealth effects associated with the announcements of convertible debt issues, whereas issues with lower ratings essentially exhibit no wealth effects. At first, this finding seems difficult to reconcile with theory. However, Stein argues that the greater the potential for financial distress (lower bond rating), the more credible is convertible debt as a signal of optimism, since without the conversion into equity companies would be left with a debt overhang.

Davidson, Glascock and Schwartz (1995) investigate Kim's signaling hypothesis and Stein's delayed equity motivation on a sample of 146 convertible bond issues in the U.S. market between 1980 and 1985. Davidson *et al* propose the use of the expected time until the convertible becomes at-the-money as a proxy that captures both Kim’s and Stein’s equity related motives for issuing convertible debt. On one hand it depends upon the conversion ratio, which is perceived as the signal sent to the market in Kim's model. On the other hand it depends on the market's expectations about the firm's growth rate, which relates this measure to Stein's delayed equity argument. Davidson *et al* argue that a relatively low conversion ratio compared to the market's expectations about the growth will result in a relatively short expected time for the option becoming at-the-money, effectively making the convertible issue more equity-like and vice versa. Firstly, their results show that the average expected time for the convertible options to become at-the-money is less than 1.5 years. Secondly, the shorter the expected time until the convertible bond becomes at-the-money (more equity like as conversion is more likely), the more negative the wealth effect associated with the announcement is. The authors interpret the first result as support for Stein's delayed equity motive and the second result as being consistent with Kim's conversion prices signaling mechanism.

Based on Stein's argument for the use of convertible debt Jen, Choi and Lee (1997) test two hypotheses using a sample of 158 convertible issues in the U.S. market between 1976 and 1985. The first "growth funding" hypothesis states that companies with large and growing capital needs and

limited debt capacity are more likely to issue convertibles and thus create a future equity base with lower flotation and information costs (less dilution due to information asymmetries). The second "expected cost of financial distress" hypothesis states that issuers with high expected costs of financial distress and limited additional debt capacity will have a greater incentive to reduce the interest coupon (due to the conversion option) and lower the probability of financial distress by issuing convertibles. Both hypotheses together yield the idea that high-growth companies with limited debt capacity and high expected costs of financial distress are more likely to issue convertibles. The market is expected to react more favorably to convertible issues announced by such companies than to the issue announcements made by low-growth companies. Jen *et al* find two-day abnormal returns to be significantly negative (i.e. -2.15 percent) for the whole sample. They also note a stock price run-up prior to announcement date. Using a standard cross-sectional regression analysis, where they regress the cumulative average abnormal returns on a set of independent variables, they find support for the two hypotheses and thus Stein's "backdoor equity" argument. Firms issue convertible debt because of the high-growth potential and limited debt capacity (costly or unavailable debt financing), while at the same time managers believe that equity prices do not properly reflect the firm's value and new equity issues would not be favorable to the existing shareholders (costly equity financing).

Similarly to Davidson *et al* (1995), Magennis, Watts and Wright (1998) explore Kim's signaling hypothesis on a sample of 45 convertible issues in the Australian market between 1986 and 1995. To measure, whether the convertible issue is more equity- or debt-like, they use the expected time for the convertible options to become at-the-money as the proxy measure. The longer the expected time to at-the-money of the conversion option is, the more debt-like the convertible issue is. The size of the abnormal returns should be positively related to the expected time of the convertible option to become at-the-money. Magennis *et al* indeed find this relationship to be positive and significant . This yields support for Kim's signaling hypothesis. However, they claim that convertibles are not simply substitutes for equity or debt, but rather *"…a "ready-made" capital structure"* (Magennis *et al* 1998: 313), as a single convertible issue can be a *"…simple and cheaper alternative (to separate debt and equity issues)"* (Magennis *et al* 1998: 314).

Lewis, Rogalski and Seward (1999) investigate Stein's backdoor equity hypothesis and Green's risk-shifting hypothesis on a sample of 203 convertible issues on the U.S. market between 1977 and 1984. If the hypothesis of risk-shifting holds, convertible debt issuers must have higher agency costs than straight debt issuers. Should the Stein's hypothesis be correct, convertible debt issuers must have higher adverse selection and financial distress costs than common equity issuers. Lewis *et al* classify convertible debt offers as either debt- or equity-like by estimating the probability of conversion of

convertible bond into equity at the maturity[19]. They confirm the findings of previous studies of announcement dates wealth effects, where the most negative effects are for equity issues, a bit less negative for convertibles issues and somewhat neutral for straight-debt issues. Firms that issue convertibles are smaller in terms of capitalization (size is often seen as proxy for information asymmetry), riskier in terms of total risk, with better pre-issue stock performance and more financial slack (consistent with the model of Myers and Majluf 1984) and with highly profitable growth opportunities. Firms that issue debt-like convertibles are smaller than those that issue straight debt, have higher market-to-book ratios, lower cash flows, lower dividend payouts, higher stock volatility and higher leverage before the issue. These findings about debt related costs are consistent with the hypothesis that firms use debt-like convertibles to control for the asset substitution (risk-shifting) problem. The equity related financing costs indicate that debt-like convertibles are issued when future economic conditions are expected to be good (good growth opportunities). Investment opportunities are significantly more profitable for equity-like convertible debt issuers than for common equity issuers. Equity-like convertible issuers have more financial slack than common equity issuers, which according to Myers and Majulf (1984) implies greater adverse selection costs. Lewis *et al* see this as evidence that issuing equity-like convertibles instead of common equity mitigates information asymmetry problems. Common stock issuers are riskier, both in terms of systematic and total firm risk, than firms that issue equity-like convertibles. Overall, the effects of equity related costs are consistent with the backdoor-equity hypothesis, since the adverse selection costs are higher for equity-like convertible issuers than for common equity issuers.

In the follow up paper Lewis, Rogalski and Seward (2001) investigate long-run performance of companies issuing convertible debt. Lewis *et al* argue that issuers might be using the convertible debt market because they were "rationed out" of the equity market. As mentioned in Section 2.2.5 this provides another motive for issuing convertible debt. On a sample of 566 convertible debt issues in the U.S. market from 1979 to 1990 they find deteriorating operating performance of the issuers of convertible bonds following the convertible debt issue compared to the matched sample of non-issuing firms. However, the difference in operating performance is not significant as in the case for equity issuing firms compared to the matched sample of non-issuing firms. Lewis *et al* interpret these findings as evidence somewhat contradicting the arguments of Green (1984) and Mayers (1998). Lewis *et al* argue that in Green's and Mayers' models it is implicitly assumed that one of the consequences of a convertible debt issue would be that firms invest only in positive net present value projects. Given a relatively deteriorating performance of convertible bond issuers, they conclude that convertible debt does not completely resolve risk-shifting and / or managerial discretion (overinvestment problem). On the other hand, they see the findings as support for Stein's delayed

[19] This is estimated using the standard Black-Scholes assumptions, where the underlying stock follows a geometric Brownian motion.

equity motive, as firms may choose a convertible debt issue over an equity issue when they expect improved operating performance in the future. Lewis *et al* consider the findings on relative operating performance of convertible versus equity issuers as support for their alternative explanation for the use of convertible debt due to the rationing in the equity market. This rationing means that some firms are allowed to access the equity market, but only if their post-issue performance proves to be sufficient.

Mayers (1998) empirically tests the proposed "sequential financing" rationale for convertible debt issues. If the sequential financing hypothesis holds, firms will exhibit intensive investment-related activity at the time of calls of convertible bonds. Mayers documents that issuers of convertible debt have higher than industry median leverage, higher market-to-book ratios, higher R&D costs relative to sales and a lower than industry median ratio of tangible to total assets. For these companies convertible debt represents 30 percent of total debt on average. Somewhat contrary to the sequential-financing hypothesis is the large size of the firms in the sample, since the sequential-financing hypothesis is based on the issue cost economization, which is more important for smaller firms. Compared to a matching sample of non-issuing firms, Mayers finds statistically significant larger capital expenditure changes for companies that issued and called convertible debt in the call year and in the year following the call. Calls of convertibles that precede significant changes in financing activity seem to be an important breakpoint. This breakpoint signals an increased rate of new financing, with straight debt being the most popular instrument. Mayers argues that this evidence does not support Stein's model, since calls are not being executed to avoid possible financial distress, as new debt is issued shortly after the calls. This, combined with increased investment activities, gives support to the sequential-financing hypothesis.

In their analysis of 129 convertible debt issues on the UK market in the period 1982 to 1996 Abhyankar and Dunning (1999) find limited support for Stein's model and for the risk estimation arguments of Brennan and Kraus (1987) and Brennan and Schwartz (1988). Similarly as in some other studies (for example McConnell and Muscarella 1995) they observe a positive effect on abnormal returns in firms, which use the proceeds to finance capital expenditure, while a negative effect is observed in firms, which dedicate the proceeds to refinancing, mergers and acquisitions and general expenditure.

Chang, Chen and Liu (2004) test Mayers' sequential financing hypothesis based on a sample of 109 issues of Taiwanese firms. They develop and test two implications directly related to Mayers' model. The first implication is related to the overinvestment problem. If convertibles are an effective way to mitigate this issue, they are more valuable in cases, where current investments and future investment options are highly positively correlated. According to Chang *et al* this is a feature generally found in firms with focused activities and more volatile cash flows (since they are not diversified). Therefore,

such companies will benefit more from the use of convertibles. Essig (1991) documents volatility of corporate cash flows to be positively related to the use of convertible debt. The second testable prediction refers to the net new financing (gross proceeds less refinancing) that companies will raise during the life of convertible bond. If indeed Mayers' hypothesis holds, companies want to avoid costly external financing when capital needs are high and should therefore mostly rely on internal funds during the life of the convertible bond. Chang *et al* find support for both implications related to the sequential-financing motivation for the issue of convertible securities. The difference in size of the wealth effects associated with the announcement of the convertible debt issue between companies with more focused and companies with less focused activities is significant. The wealth effects for the subsample of companies with focused activities are significantly positive, while negative and not significant for those with less focused activities.

In another paper Lewis, Rogalski and Seward (2003) use a sample of 588 convertible debt issues in the U.S. market in the period 1972 to 1992. They attempt to reconcile the diverging evidence on the motives for convertible debt issues and determinants of stock price reactions to convertible debt announcements. They analyze the impact of issuer characteristics on the size of the wealth effect associated with the announcement of convertible debt offers. They again split the issues according to the previously mentioned delta measure into more equity- and more debt-like issues. Lewis *et al* find support for the risk-shifting motive proposed by Green (1984), as investment related issuer characteristics do not affect the investor reactions for the debt-like offers. They do not document strong support for the risk estimation argument proposed by Brennan and Schwartz (1988), as leverage negatively affects abnormal returns for issuers that are neither equity- nor debt-like. They find strong support for Stein's (1992) backdoor equity hypothesis, as good industry-adjusted growth opportunities of the issuers positively affect abnormal returns, especially if they invest the proceeds in new projects. Following a strain of the literature on market timing (see for example Bayless and Chaplinsky 1996) they analyze the impact of the market, issue and issuer characteristics on abnormal returns for subsamples of cold, normal and hot market periods of security offerings. They show that the size of the wealth effect associated with the announcement of convertible debt issue also depends on the aggregate volume of the issues in the seasoned equity markets. Moreover, firm-specific factors seem to be more important in periods of cold equity markets, when investors more closely analyze these factors than in periods of more attractive equity issues.

Similar to the analysis of Lewis *et al* 2003 is the study of Dutordoir and Van de Gucht (2004), conducted on 222 convertible debt issues on eight Western European markets in the period 1990 to 2002. They explicitly test Brennan and Kraus' (1987) and Stein's (1992) motivations for the use of convertible debt. Dutordoir and Van de Gucht document strong support for the Brennan and Kraus' model and only limited support for Stein's backdoor-equity motivation. In the analysis they point to

certain differences between the U.S. and Western European markets, as the convertible issues on Western European markets seem to be more debt-like and firms are much larger than those on the U.S. market.

<Insert Table 5 here>

In Table 5 empirical research related to theoretical motivations for the issue of convertible debt is summarized. The summarized studies use issue, accounting and stock prices information to capture issuer and issue specific characteristics. In the studies a cross-sectional analysis is mostly used as the research method; while Lewis *et al* 1999 for example also used a multinomial logit model in their study to investigate security choice decision. As the table shows, the most frequently tested motivation was Stein's "backdoor equity" explanation for the use of convertible debt. The support for it (and Kim's hypothesis as well) has consistently been documented. Green's (1984) and Mayers' (1998) agency cost resolution based arguments have also been explored and generally supported, but with some studies finding contradictory or mixed evidence. Tax motivation and managerial entrenchment explanations have not been tested directly to our knowledge, while little and mixed evidence has been found to support Brennan and Kraus (1987) and Brennan and Schwartz (1988) motivations for the use of convertible debt. One of the reasons for this disparity in popularity of individual motives might be in the ease of deriving and applying meaningful empirical tests. To find support for Stein's motivation, most of the researchers rely on establishing whether the largest share of convertible bonds in the sample is equity-like. All the other theoretical motivations are more difficult to address, as the nature of convertible debt is very complex.

3.3 Survey Evidence

There have not been many surveys on convertible debt issues. The first survey was done by Pilcher (1955), followed by Brigham (1966) and Hoffmeister (1977), while the latest surveys include Billingsley and Smith (1996), Graham and Harvey (2001) and Bancel and Mittoo (2004). The survey by Bancel and Mittoo (2004) has been conducted on an international scale (European countries), while other surveys have been done for the U.S. market. The sample sizes vary substantially across the surveys.

Pilcher's (1955) sample includes 22[20] responding presidents of corporations, Brigham (1966) bases his conclusions on a sample of 22 responding firms, Hoffmeister's (1977) survey is composed of 55

[20] There were actually 75 repondents, but only 22 are for companies that issued convertible debt. Others were from companies that issued convertible preferred stock.

respondents, Billingsley and Smith (1996) have a sample of 88 responding firms, Graham and Harvey (2001) base their survey on 392 responses from CFOs and Bancel and Mittoo (2004) have a sample of 29 firms from eight countries.

In most of the surveys questions were grouped into the following broader categories:

- Rationales (reasons) for issuing convertible securities
- Financing alternatives
- Use of funds
- Conversion policy
- Other factors

It is important to note that the difference between the questions about the use of convertible debt related to the motives, put forward by practitioners, and the theoretical motives, put forward by academics. In general, two distinctive motivations are put forward by practitioners. Namely, practitioners seem to consider convertible debt as the cheaper source of financing than straight debt, as it bears a lower coupon rate. Closely related to this view is also the role of the conversion option as the so-called “deal sweetener”, which helps achieve a lower coupon rate and sell otherwise hard to sell debt issue. Secondly, practitioners traditionally consider convertible debt to be a way of selling the equity at a premium, as the conversion price is higher than the current stock price. As previously mentioned, both views are refuted by academics, who offer other motives for the use of convertible debt.

As theoretical motivations for the use of convertible debt only started to emerge in the late eighties, early surveys do not rely on any theoretical motivation for the issuance of convertible debt, but rather rely on the mentioned general perceptions among investors and managerial communities. Pilcher (1955) asked managers about the primary motivation for issuing convertible securities, where raising a common equity and "sweetening" (with conversion option) the senior security (debt) were offered as possible answers. 82 percent of respondents said that the prime motivation for the issue of convertibles was to raise equity. Brigham (1966) based the questions on the primary interest in either equity or debt, where a company was not able to issue one of those and opted for convertibles instead. 73 percent of the respondents claimed that their primary interest was in equity. He also asked questions about equity undervaluation, concerns about equity dilution, high cost of straight debt and targeting a particular investor's group. 68 percent of respondents claimed that convertibles were the way to sell the equity at a premium, while only 27 percent stated that convertibles were issued in order to “sweeten” otherwise difficult to sell straight debt issue. Hoffmeister (1977) related the questions to interest rate reduction (cost of debt in Brigham 1966), perceived undervaluation of equity, enhancement of an otherwise difficult to sell issue (marketability in Pilcher 1955 and debt

sweetening), and popularity of convertible debt at the time, equity dilution and a favorable accounting treatment. 70 percent of those surveyed found the issuance of delayed equity as an important feature of convertible debt, while 58 percent claimed that reducing the interest cost was an important consideration. Somewhat more than a quarter of the respondents said that marketability of the issue also played an important role. Interestingly, Hoffmeister also found some differences between large and medium-sized firms, where the managers of large firms more often stated cheaper debt as the motivation for the use of convertibles, while the managers of medium-sized firms perceived delayed equity as a more important reason.

By the time of the Billingsley and Smith 1996 survey several theoretical motivations for the issuance of convertible bonds emerged. They used the questionnaire to test whether the theories about delayed equity (Stein 1992) and risk shifting[21] (Green 1984) in fact drive a firm's decision to issue convertible securities. Aside from the questions related to practical motivations for the use of convertible debt, which were asked in previous surveys[22], they also asked questions about delayed equity and bondholder protection. On top of those, they also pose a question about the advice of an investment banker and the popularity of convertible debt at the time. The lower coupon rate compared to straight debt was cited as the primary motivation for the issuance of convertibles by most of the mangers, while managers in general offered mixed responses regarding the sale of equity at a premium. The survey is also the first that explicitly asks about the ranking of other financing alternatives that were considered. Managers most often claimed that straight debt was the primary alternative to convertibles, while equity issuance came second. Billingsley and Smith document a strong support for Stein's delayed equity argument, while almost no support for Green's risk shifting argument[23]. Surveyed managers also gave high importance to the window of opportunity for the issuance of the securities.

Among the questions regarding capital structure, payout policy and capital budgeting Graham and Harvey (2001) asked the surveyed CFOs specific questions about convertible bonds. The questions were aimed at testing the risk estimation models of Brennan and Schwartz (1977) and Brennan and Schwartz (1988), the risk shifting model of Green (1984) and the sequential financing model of Mayers (1998)[24], as well as the delayed equity model of Stein (1992). Similarly to previous surveys they also ask questions about equity dilution, lower coupons on convertibles and popularity of convertible securities at the time. 58 percent of the respondents viewed convertible debt as an

[21] Billingsley and Smith (1996) actually do not mention Green (1984) explicitly, but the question they ask is a direct test of Green's risk shifting proposition.
[22] lower coupon rates versus straight debt, over and undervaluation of stock at the time
[23] Note that results of the survey also depend on the way questions are asked. In most cases where questions denote negative meaning, we do not believe that answers are equally truthful as with the other questions. This might also provide an alternative explanation to finding no support for certain issues.
[24] The test of Mayers' model was not related to a direct question in the survey.

inexpensive way to issue delayed equity, while more than 40 percent of the surveyed CEOs found a lower coupon rate to be an important motive for the issue of convertible debt. Graham and Harvey find support for the risk estimation argument, since more than 40 percent of those surveyed stated that issuing convertibles was a way to attract investors unsure about the riskiness of the company. Similarly as in the study of Billingsley and Smith (1996) Graham and Harvey did not document any support for Green's risk shifting argument.

The survey by Bancel and Mittoo (2004) encompasses the widest spectrum of theoretical motivations. Aside from delayed equity, risk shifting motives and the risk estimation models, they also formulate questions with respect to the signaling model of Constantinides and Grundy (1989), which is closely related to that of Stein (1992). Bancel and Mittoo also ask questions about the relationship between a convertible debt issue and rating requirements, call provisions, dilution concerns, importance of covenants, tax advantage of convertibles[25], reducing the risk of hostile takeover[26], popularity of convertible debt at the time and tapping a group of international investors. They find strong support for Stein's delayed equity argument, since around 86 percent of respondents state “delayed equity” as the most important or very important reason for the issue of convertibles. Around 55 percent of respondents claim that the signaling role of convertibles is an important feature, which gives further support both to Stein’s and Kim’s (1990) models. Somewhat less support is documented for the sequential financing hypothesis (Mayers 1998), as only about 28 percent of the managers find the call feature of convertibles important and the same percentage claim that they would force the conversion as and when future investment opportunities occur. Limited support is shown for the risk estimation (Brennan and Kraus 1987 and Brennan and Schwartz 1988) motivations for the use of convertible debt, as only about 21 percent of the respondents claim that the most important reason for the issue of convertibles is to attract investors, unsure about the risk of the firm. The same weak support is documented for the tax based explanation[27] (Jalan and Barone-Adesi 1995), while no support is found for Isagawa's (2002) managerial entrenchment motivation and Green's (1984) risk shifting argument.

In the surveys managers were also asked to state and rank the financing alternatives to convertible debt at the time of the issue. These financing alternatives range from simple equity and straight debt to preferred stock (convertible and non-convertible), private placements and synthetic convertible debt (debt with warrants). Bancel and Mittoo (2004) find that for the most of the companies convertible debt is the alternative to straight debt. The result is somewhat in conflict with the responses relating to the question of delayed equity, where over 80 percent of the managers find that motive to be the most

[25] Note that this is implicitly related to Jalan and Barone-Adesi (1995) argument, although Bancel and Mittoo do not mention them.
[26] Note that this is implicitly related to the managerial entrenchment motivation by Isagawa (2002), although Bancel and Mittoo do not explicitly relate the survey question to Isagawa's argument.
[27] They find that this motivation is more important for the low-growth companies.

or very important. On the other hand, this result is in line with the findings of Dutordoir and Van de Gucht (2004) for the Western European markets, where most of the convertible bonds are structured to be more debt-like.

Bayless and Chaplinsky (1996) present a model of window of opportunity for seasoned equity offerings. They show that negative price reactions in hot equity markets are lower than in cold equity markets and attribute this difference in part to reduced levels of informational asymmetries. The same reasoning could then also be applied to convertible bond issues. Bancel and Mittoo (2004) surveyed managers on how the market conditions affected their decision to issue convertibles, by asking them about the importance of the different factors (overvaluation and undervaluation of equity, levels of interest rates, volatility of the stock market, among others). Most of the respondents claim that high stock market volatility, which translates into a higher value of the conversion option, and low interest rates were the key factors that affected the timing of the convertible debt issue.

<Insert Table 6 here>

In Table 6 a summary of survey evidence relating to the theoretical motivations for the use of convertible debt is presented. With respect to practical motivations for the issue of convertible debt, surveys in general find strong to moderate support for both "cheap" debt argument and the motivation based on selling the equity at the premium. The importance of these two arguments, which are most often put forward by practitioners, varies over time. For example, Hoffmeister (1977) notes that the shift he observes from delayed equity financing toward a desire to reduce debt interest cost is consistent with the highest interest rates experienced in 30 years at the time. Nevertheless, both practical motivations have remained very important arguments for managers. With respect to theoretical motivations for the use of convertible debt, all the surveys find strong evidence for the delayed equity motivation. In the latest two surveys some support for the risk estimation argument and the sequential-financing hypothesis is documented, while no support is found for the managerial entrenchment and risk shifting argument for the use of convertible debt in particular[28]. The survey questions do not differ much between (in particular the recent) surveys and aim at the most direct tests of different theoretical motivations for the use of convertible debt. Although this direct approach is useful for the interpretation of the results, some questions, which are too direct (for example the question on risk shifting or bondholder expropriation), might invoke answers that do not reflect the true state of affairs. The weakness of more indirect questions of course is that the results might be subject to different interpretations.

[28] Veld (1994) has done a survey for warrant-bond loans in the Netherlands. His findings are similar to those of the studies for convertibles. He finds support for the practical motives, but not for theoretical motives, such as for Brennan and Schwartz (1988) and Green (1994). His study does not include questions on the Stein (1992) model.

4 CONCLUSION

In this paper we have summarized and reviewed the most relevant up to date literature on the motives for the issuance of convertible debt. The evidence is far from being conclusive and unanimous as to why companies choose to issue convertible debt and how these motives affect investor reactions to convertible debt issue announcements. However, there exist some findings, which are common to all the empirical research.

First of all, the wealth effects associated with the convertible debt announcements are generally negative and in between those for straight debt and equity. Secondly, convertible debt can be structured to be either more debt- or equity-like. Convertible issues that are more equity-like induce stock market responses at the issue announcements closer to those, documented for equity issues. This is consistent with the adverse selection model of Myers and Majluf (1984). Thirdly, Stein's (1992) delayed equity motive, Kim's (1990) signaling theory, Mayers' (1998) sequential- financing argument and Green's (1984) risk shifting hypothesis are the most investigated theoretical argumentations for the use of convertible debt versus straight debt and / or equity. The support for the delayed equity, signaling and sequential financing models, found in cross-sectional analyses, is corroborated in the surveys. Some support is documented for the risk shifting hypothesis in the cross-sectional empirical analysis, but is completely refuted in the surveys. Limited evidence is provided for Brennan and Kraus (1987) and Brennan and Schwartz (1988) risk estimation explanations, both in cross-sectional analyses and surveys. Tax based motivation for the use of convertible debt (Jalan and Barone-Adesi 1995) and Isagawa's (2002) managerial entrenchment argument have not been investigated in cross-sectional analyses, while surveys yield no support. Finally, to a large extent surveys reveal that managers still find a lower coupon rate of convertible debt as an important argument for its issuance, although the importance of this motive varies over time. Given that convertibles include a conversion feature (that comes at a price), a view that convertibles are a cheaper source of financing than straight debt is deceptive. The same is true for the practitioners' view that convertibles provide means of selling the equity at a premium.

Based on a review on the theoretical and empirical literature on why companies issue convertible bonds we can conclude that there are large discrepancies between theory and practice. The practical point of view shows up in surveys among managers that were responsible for issuing convertible bonds. These surveys show that they base themselves on irrational motives. The theoretical literature presents a number of rational motives. These rational motives are confirmed in some of the cross-sectional studies, but they are not confirmed in the survey studies. There are two possible explanations for the different outcomes of the survey and cross-sectional studies. The first explanation is that the

surveys are sensitive to the question contents. Therefore they may not yield reliable results. It is often argued that "*managers act smarter than they speak*". Therefore they may follow rational motives, without being aware of this. The second explanation is that the proxies in the cross-sectional studies may be weak. For example, it is very hard to measure a concept of informational asymmetry using only stock market and/or accounting data. In our view, future research in this field should aim for an approach that captures the best of both worlds. Such an approach would ideally combine the different techniques in one study. More specifically, besides using surveys to ask direct questions, it is also possible to use them to find proxies for variables that are used in cross-sectional studies. This approach was used before by De Jong and Van Dijk (2003) in a study on the capital structure of Dutch companies, and by De Jong, Van Dijk, and Veld (2003) in a study on the dividend and share buy-back policies of Canadian firms. We believe that such an approach may bridge the gap between theory and practice.

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Table 1

Number of convertible bond issues in different regions and countries in the period 1990-2003; source of the data: SDC New Issues database

Region / Country	*Number of issues*	*Percent of all issues*
Europe (All)	**1025**	**14.2%**
UK	143	2.0%
France	216	3.0%
Germany	158	2.2%
The Netherlands	152	2.1%
US	**2166**	**30.0%**
Canada	**280**	**3.9%**
Asia (All)	**2967**	**41.2%**
Hong Kong	110	1.5%
Japan	1632	22.6%
Taiwan	185	2.6%
South Korea	827	11.5%
Australia	**235**	**3.3%**
Rest of the World	**535**	**7.4%**
World (Total)	**7208**	**100.0%**

Table 2

Yearly breakdown of the number of convertible bond issues in the period 1990-2003; source of the data: SDC New Issues database

Year	Number of issues	Percent of all issues
1990	335	4.65%
1991	384	5.33%
1992	308	4.27%
1993	640	8.88%
1994	797	11.06%
1995	490	6.80%
1996	710	9.85%
1997	583	8.09%
1998	598	8.30%
1999	436	6.05%
2000	364	5.05%
2001	552	7.66%
2002	381	5.29%
2003	630	8.74%
Total	**7208**	**100.00%**

Table 3

Descriptive statistics of the issue sizes in different countries and the Global market in the period 1990-2003 (the values are in millions of US dollars, except for N (number of issues) and CV (coefficient of variation)); source of the data: SDC New Issues database

Country	*Mean*	*Median*	*Minimum*	*Maximum*	*Standard deviation*	*N*	*CV*
UK	324.66	159.50	23.40	2026.80	433.10	141.00	1.33
France	404.61	245.70	2.40	3097.20	481.16	215.00	1.19
Germany	149.84	56.40	3.90	5096.30	436.68	154.00	2.91
The Netherlands	368.25	200.90	0.30	2908.30	506.99	151.00	1.38
U.S.	237.55	135.00	0.10	4500.00	331.71	2162.00	1.40
Canada	122.85	87.80	0.00	1500.00	167.92	236.00	1.37
Hong Kong	181.91	115.00	0.40	2500.00	342.48	109.00	1.88
Japan	116.36	65.80	0.10	2851.80	188.49	1632.00	1.62
Taiwan	124.65	100.00	13.20	700.00	100.25	185.00	0.80
South Korea	34.45	12.50	0.20	1317.80	91.38	804.00	2.65
Australia	93.65	8.50	0.10	1500.00	183.41	221.00	1.96
World(Total)	175.46	85.40	0.00	5096.30	307.55	7074.00	1.75

Table 4

Studies of wealth effects associated with convertible debt issue announcements. CAAR denotes Cumulative Average Abnormal Return.

Study	Period	Sample size	CAAR (-1,0) (%)	CAAR (0,1) (%)
U.S. domestic market				
Dann and Mikkelson (1984)	1970-1979	132	-2.31 ***	-
Mikkelson and Partch (1986)	1972-1982	33	-1.97 ***	-
Eckbo (1986)	1964-1981	75	-1.25 ***	-
Hansen and Crutchley (1990)	1975-1982	67	-1.45 ***	-
Long and Sefcik (1990)	1965-1984	134	-0.61 ***	-
Billingsley, Lamy and Smith (1990)	1971-1986	104	-2.04 ***	-
Kim and Stulz (1992)	1970-1984	259	-1.66 ***	-
Davidson III, Glascock and Schwarz (1995)	1980-1985	146	-1.40 ***	-
Jen, Choi and Lee (1997)	1976-1985	158	-2.15 ***	-
Lewis, Rogalski and Seward (1999)	1977-1984	203	-1.51 **	-
Lewis, Rogalski and Seward (2003)	1978-1992	588	-1.09 **NA**	-
Arshanpalli, Fabozzi, Switzer and Gosselin (2004)	1993-2001	229	-3.07 ***	-1.92 ***
Weighted average (sample sizes are weights)			*-1.63*	
Japanese domestic market				
Kang and Stulz (1996)	1985-1991	561	0.83 ***	1.05 ***
Christensen, Faria, Kwok and Bremer (1996)	1984-1991	35	0.60	-
Taiwanese market				
Chang, Chen and Liu (2004)	1990-1999	109	0.42	-
Australian market				
Magennis, Watts and Wright (1998)	1986-1995	45	-1.08 **	-
Dutch market				
De Roon and Veld (1998)	1976-1996	47	0.63 **	0.54 NA
UK market				
Abhyankar and Dunning (1999)	1982-1996	129	-1.20 ***	-
French market				
Burlacu (2000)	1981-1998	141	-0.20 ***	-
Western European markets				
Dutordoir and Van de Gucht (2004)	1990-2002	222	-1.18 ***	-1.42 ***
German and Swiss markets				
Ammann, Fehr and Seiz (2004)	1996-2003	55	-0.18	-1.36 **

*** - denotes significance at 1% level
** - denotes significance at 5% level
NA - not reported

Table 5

Theoretical motivations for issuing convertible debt and related empirical research

Empirical research	Theoretical motives								
	Asymmetric information based				Agency cost based		M. entrench.	Tax	Eq. rationing
	BK (1987)	BS (1988)	K (1990)	S (1992)	G (1984)	M (1998)	I (2002)	JBA (1995)	LRS (2001)
Davidson, Glascock and Schwartz (1995)			+	+					
Jen, Choi and Lee (1997)				+					
Magennis, Watts and Wright (1998)			+						
Mayers (1998)						+			
Lewis, Rogalski and Seward (1999)				+	+				
Abhyankar and Dunning (1999)	o	o		o					
Lewis, Rogalski and Seward (2001)				+	-	-			+
Lewis, Rogalski and Seward (2003)		o		+	+				
Chang, Chen and Liu (2004)						+			
Dutordoir and Van de Gucht (2004)	+			o					

+ / strong support
o / limited support
- / contradicting evidence

- BK(1987) refers to Brennan and Kraus (1987)
- BS(1988) refers to Brennan and Schwartz (1988)
- K(1990) refers to Kim (1990)
- S(1992) refers to Stein (1992)
- G(1984) refers to Green (1984)
- M(1998) refers to Mayers (1998)
- I(2002) refers to Isagawa (2002)
- JBA(1995) refers to Jalan and Barone-Adesi (1995)
- LRS(2001) refers to Lewis *et al* (2001)

Table 6

Theoretical motivations for issuing convertible debt and related survey research

Survey			P (1955)	B (1966)	H (1977)	BS (1996)	GH (2001)	BM (2004)
Sample size			22	22	55	88	392	29
Practical motives	lower coupon rate than on straight debt / deal "sweetener"		o	o	+	+	o	+
	sell equity at the premium		+	+	+	o	+	o
Theoretical motives	Asymmetric information based	BK (1987)					+	o
		BS (1988)					+	o
		K (1990)						+
		S (1992)				+	+	+
	Agency cost based	G (1984)				-	-	-
		M (1998)					+	+
	Managerial entrenchment	I (2002)						-
	Tax motivation	JBA (1995)						o
	Equity rationing	LRS (2001)						

+ / strong support
o / limited support
- / no support

- BK(1987) refers to Brennan and Kraus (1987)
- BS(1988) refers to Brennan and Schwartz (1988)
- K(1990) refers to Kim (1990)
- S(1992) refers to Stein (1992)
- G(1984) refers to Green (1984)
- M(1998) refers to Mayers (1998)
- I(2002) refers to Isagawa (2002)
- JBA(1995) refers to Jalan and Barone-Adesi (1995)
- LRS(2001) refers to Lewis *et al* (2001)
- P (1955) refers to Pilcher (1955)
- B (1966) refers to Brigham (1966)
- H (1977) refers to Hoffmeister (1977)
- BS (1996) refers to Billingsley and Smith (1996)
- GH (2001) refers to Graham and Harvey (2001)
- BM (2004) refers to Bancel and Mittoo (2004)