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Determinants Of The Issuance Of Put/Call Convertibles In The Non-Financial Sector Of The US Market

Abstract

The aim of this article is to characterize and show the differences between issuers of ordinary convertibles and convertibles with attached put/call provisions (put/call convertibles). The research was carried out on a sample of 379 firms in the US market, outside the financial sector, between 2002 and 2011. It turns out that the issuers of put/call convertibles are the companies with a higher risk exposure, associated with, inter alia, a higher level of indebtedness and worse ratio between the issue value to the fixed assets value. Adding the put/call provisions is aimed at decreasing issuers' risk exposure, which may increase the market demand for this type of convertible securities.

Keywords: *financing, convertible bonds, put/call provisions, U.S. market*

1. Introduction

A convertible bond is a financial instrument which at maturity gives the bondholders the right to convert it into the issuer's stock. Convertible bonds were first issued in the USA in 1967, and since then the volume amount of hybrid debt trade in the global capital market has been rising steadily. In 2012,

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the total amount of convertibles issued was $9200 bln USD, mainly in Germany (65%), Switzerland (15%) and tax havens such as Guersey (7%).

Researchers have been for more than 50 years trying to identify the theoretical motives for using convertible debt. The theoretical premises of their issuance are based on an asymmetric information framework (see, inter alia, Brennan and Kraus 1987; Brennan and Schwartz 1988; Stein 1992), an agency theory framework (e.g. Green 1984; Mayers 1998; Isagawa 2002), rationing in the equity market (Lewis *et al.* 2001) or tax advantage motives (Jalan and Barone-Adesi 1995). In order to make convertible debentures more profitable for the issuers and the bondholders, and attract additional purchasers, very often the companies decide to add *call* and *put* provisions. This phenomenon has been the object of researchers' interest since the late 1970s (e.g. Ingersoll 1977; Harris and Raviv 1985; Asquith and Mullins 1991; Chemmanur and Simonyan 2010). In 2012 so-called *put/call convertibles* constituted up to 12% of the total number of convertible issues. However, taking into account exclusively companies outside the financial sector, the total share of *put/call convertibles* increases to 30%, which means that it is necessary to conduct an accurate research study into this convertible bond type among production and service companies.

The main aim of this article is to analyze the *put/call convertibles* market and to show the potential differences between the issuers of the convertible bonds with and without the *call* and the *put* options. Previous research on *callable* and *putable convertibles* has concentrated mainly on hybrid securities issued all over the world, without a division into countries or particular economic sectors. Our paper differs from them in terms of the research sample, which includes the convertibles issued only in the American market, the biggest worldwide market of *put/call convertibles*. The analysis conducted within only one country allowed us to eliminate the taxation motive for their issuance. Therefore, the conclusions to be drawn from our research may be of a more general character. It may be also possible to compare our findings with the outcomes of studies carried out by means of the same research method, but considering hybrid securities issued in other parts of the globe.

The research sample encompassed 379 companies in the American market, which the best represents the group of subjects outside the financial sector, between 2002 and 2011. It turns out that the issuance of put/call convertibles is more prevalent in firms with a higher financial risk exposure, connected with a higher level of indebtedness and smaller possibilities to issue secured debentures.

This paper is structured as follows. Sections II and III describe the theoretical premises of the issuance of convertible bonds and the application of the call and put provisions. Section IV provides the sample description and

methodology. Section V discusses the research results. Section VI summarizes and concludes the article.

2. Theoretical premises of hybrid debt issues

In their seminal paper, Modigliani and Miller (1958) started a discussion concerning the issue of the capital structure; a discussion which is still in progress. However, oversimplified assumptions in their model (e.g. the existence of a perfect market, no corporate tax, no transaction costs, and symmetric access to information) make its practical verification impossible. For this reason, further research focused on capital structure problems under imperfect market conditions. Two theories gained the most interest: (1) *information asymmetry theory,* which assumes an asymmetric access to information among managers and market participants related to companies' market activities and their future prospects[1]; (2) an *agency theory,* describing conflicts between managers (*agents*) and investors (*principals*). On the basis of these theories, several theories concerning hybrid debt have been developed, trying to explain why firms decide to gain capital through the issuance of convertible bonds.

The theoretical premises of the application of convertibles have been the subject of researchers' interest since the mid-1960s. (Brigham, 1966). This was caused by the desire to understand the growing popularity of these instruments, especially in the US market. Brennan and Kraus (1987) suggested that junior bonds, bonds with warrants and convertible bonds are a very profitable source of capital in cases of uncertainty arising from information asymmetry, when the financial risk of the issuer is difficult to estimate. According to Brennan and Schwartz (1988), the convertible bond's value is insensitive to changes in the issuer's risk, due to its hybrid nature. Convertible debt can be treated as a package of straight bonds and warrants. An increase in uncertainty regarding

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[1] Myers and Majluf (1984) argue that an asymmetric access to information about a company's future cash flow may contribute to underestimating the value of newly-issued securities by the market. This may lead to *adverse selection* problems which result in missing profitable investment projects by managers. An information asymmetry can be mitigate through, inter alia, *signaling*. Myers and Majluf (1984) consider that the type of an issued security may pose a credible signal for the market about the true value of the issuer. For this reason the aim of the company should be to maximize the difference between the value of the newly-issued instruments and their true value estimated by the market. The issue of the class of security enables investors to match the issuer to a specific type of firm: either to a "good firm" or to a "bad firm", which may allow the companies to effectively finance new investment projects. This idea was frequently used by the researchers dealing with the problems of hybrid debt financing.

an issuer's future financial prospects causes a reduction in the straight debt value, whereas the value of the warrant rises. These changes in value offset each other, which mitigates the negative effects of an information asymmetry.

Constantinides and Grundy (1989) argue that a convertible bonds issue, combined with a partial stock repurchase, creates a positive signal to the market about the future operating performance of the company. Kim (1990) presents a model showing that such a signal can be generated through a conversion ratio determined in terms of the issue. He proves that the lower the conversion ratio, the higher the level of revenues the company expects in the future.

Stein (1992) considers that convertible bonds can mitigate the negative effects of adverse selection when raising capital through stock issue is unprofitable due to information asymmetry. Equity issuance may be perceived as managers' willingness to sell overpriced securities, and the market would price them below their true value. The convertibles issue, in turn, implies that insiders have favourable information about the financial prospects of the firm. Indeed, managers must be confident that the underlying stock price will be high enough that bondholders will decide to convert debt into equity. For that reason Stein (1992) suggests that convertible bonds can be perceived of as "delayed equity" and are designed to raise it through the backdoor (*backdoor equity hypothesis*).

An agency theory likewise plays a key role in explaining the theoretical premises of the issuance of convertibles. The term "agency costs", coined by Jensen and Meckling (1976), has become a cornerstone of further publications concerning conflicts of interests between managers–shareholders, managers–bondholders or shareholders–bondholders, which directly bias the operating activity of companies.

Green (1984) says that convertibles can mitigate agency problems arising from shareholders–bondholders conflicts. According to "risk-shifting" and "asset substitution" theories, shareholders very often undertake risky investment projects in order to transfer wealth from the bondholders. Such actions are very precarious for the bondholders because in case of financial distress or an issuer's bankruptcy, they may not recover their claims. However, a conversion option attached to convertible bond enables investors to participate in any potential profits from higher-than-average investment options.

Mayers (1998) considers that well-designed convertibles allow for avoiding the negative effects of both *underinvestment* and *overinvestment* problems. His so-called *sequential financing hypothesis* is based on the issuer's uncertainty regarding the value of their future investment options (*real options*). If their value is so low that the issuer decides not to carry them out, convertibles will be simply redeemed by the issuer at maturity and the company will not face the problem of excess capital which was raised to finance an initial investment

project (avoiding the *overinvestment* problem). But if the issuer thinks that realizing a real option is somehow profitable, then exercising a conversion option will enable him to raise equity in order to finance a new investment project (avoiding the *underinvestment* problem).

Isagawa (2000) comes to similar conclusions. He shows that convertible bonds are financial instruments which may be very helpful in controlling managerial opportunism. It is assumed that managers strive for an excessive expansion of their companies and tend to over-invest. It turns out that depending on market conditions ("good" or "bad") and alternative investment decisions ("expansive" or "defensive"), managers always decide to carry out an "expansive" strategy. Convertible bonds are thought to counteract such activities. Isagawa (2002) also deals with the issue of so-called *managerial entrenchment*. According to this theory, entrenched managers do not maximize shareholders wealth but, on the contrary, they mainly concentrate on their own interests, which then determines the companies' financial policy. Well-designed convertibles may eliminate the risk of both a hostile takeover and a bankruptcy associated with undertaking excessively risky investment projects. The terms of the issue should be specified in such way that a conversion takes place only if the issuer undertakes profitable investments. Otherwise it should guarantee that converting bonds into equity do not take place.

Besides the theories based on *information asymmetry* and *agency theory*, several other studies have appeared concerning the premises of convertibles issues. Jalan and Barone-Adesi (1995) think that managers decide to use convertibles financing because of the differential tax treatments of coupon interest and dividend payments. Lewis et al. (2001) believe that hybrid debt may be a profitable source of capital under conditions of equity rationing (*equity rationing hypothesis*).

3. The call and the put provisions in convertible bonds

Many issuers decide to include several provisions which make convertible securities particularly valuable, both for companies and bondholders. These are the *call* options and the *put* options. Exercising them allows both parties to either have the bonds redeemed before their maturity or to convert them into equity. This then raises an interesting two-part question: Why has hybrid debt with built-in *call/put* options become so popular and how does it influence the financing policy of the issuers?

As far as ordinary convertibles are concerned, depending on the market conditions at their maturity, the bondholders have the right either to convert them into underlying shares or to refrain from converting and wait to have them redeemed at par by the issuer.[2] The *call/put* provisions do not affect the right either to convert the bonds or to have them redeemed, but the options may be exercised before debt maturity. Exercising the *call* option falls exclusively to the issuer. After he announces the exercise of the *call* provision (*call announcement*), the bondholders have certain number of days (*call notice period*) to decide to either convert the hybrid debt into equity or to have it redeemed at the *call price*. Assuming that the company issues convertibles in order to raise capital for the financing of certain investment project(s), *callable convertibles* may be particularly beneficial for the issuer. Firstly, they can be used as an instrument that enables the firm to force conversion when the bonds are *in-the-money* and thus increase equity (thereby reducing a company's debt level), which positively affects the company's capital structure. Secondly, exercising the *call* option may be linked with a willingness to replace previous debt with new debt with a lower coupon. This may happen in the case of decreasing market interest rates or in the event of a significant upturn in the issuer's financial results. Moreover, adding the *call* option may enhance managers' flexibility to take actions in order to counteract a deterioration in market conditions. Forcing conversion allow the issuers to not redeem debt during such period. On the other hand, exercising the *call* clause may be associated with managers' desire to cover up the unfavourable financial performance of the firm. Such a situation may occur if managers are willing to involve bondholders in excessively risky investment projects.

Ingersoll (1977a) and Brennan and Schwartz (1977) consider that under perfect market conditions and without a *call notice* period, the optimal call policy is to exercise the *call* option as soon as the conversion price exceeds the *call price*. This maximizes the market value of equity and minimizes the value of the conversion option owned by bondholders. However, Ingersoll (1977b) observed that the issuers of *callable convertibles* usually delay the calls and wait until the conversion value exceeds the call price by 43.9% on average. Since then, researchers have been trying to find the reasons behind such delay, which is not in accordance with the optimal call policy in the perfect market

Harris and Raviv (1985) tried to explain the call delay on the basis of a signalling theory. According to their theory, the investors interpret the call as unfavourable information about the issuer's financial performance, and this

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[2] Convertible bonds are *in-the-money* when the conversion value > conversion price (bondholders will probably decide to convert them into equity) and they are *out-of-the-money* when the conversion price > conversion value (bondholders will probably refrain from converting them into equity).

results in a drop of the underlying shares price. For this reason, the firm decides to exercise the *call* option when, from its perspective, the costs of the reduction in the value of the underlying stocks are less than the costs of premature redemption of the debentures from the bondholders if they do not decide to convert. In other words, the managers call the convertibles in order to force the bondholders to participate in a future decrease of the underlying shares' price.

Jaffee and Shleifer (1990) argue that a call delay is connected with a company's desire to avoid financial distress. A possible bondholders' decision not to convert the bonds after the call means that the issuer might have to redeem the convertibles at face value. In order to do so the firm might have to raise additional cash from other sources, which may lead to liquidity problems and financial distress. For this reason, companies delay the call to make sure that the probability of getting into financial trouble is as minimal as possible.

Asquith and Mullins (1991) suggest that a call delay is linked with the issuer's future cash flow level (*cash flow advantage hypothesis*). Cash flow advantage is defined as the difference between the after-tax coupon payment on convertible debt and the dividends which would be paid on newly issued stocks. If this difference is negative (after tax interest payment < dividends), it is better not to call the bond. By not calling, the company saves cash which would be used for dividends paid on converted shares, which is also beneficial for the current shareholders.

As for *putable convertibles*, these instruments are profitable particularly for the investors, because the right to exercise the *put* option before debt maturity falls to the bondholders. They decide whether and when to convert bonds into equity or wait and have the convertibles redeemed by the issuer. Chemmanur and Simonyan (2010) consider that the motives behind a *putable convertibles* issue may be explained on the basis of an asymmetric information framework, an agency theory framework, or tax-advantage-based theories. Going back to the earlier part of this article concerning the theoretical premises of issuing convertibles, it can be concluded that convertibles may mitigate agency problems arising from the conflicts between shareholders and bondholders (Green 1984). Exercising the conversion option enables the investors to participate in any increase in the market value of the issuer which results from undertaking risky investment projects. *Putable convertibles* may diminish the shareholders' incentive to take excessively risky investment projects because the bondholders can withdraw their capital whenever they notice any unfavourable actions taken by managers. Therefore it can be assumed that companies with favourable private information about their value more often decide to issue convertibles with the *put* provision. In such case, the probability of exercising the option by the investors is relatively low. As for tax motives for

the issuers, it is worth noting that about 1/3 of the *putables* issues encompass zero-coupon convertibles. The bondholders do not get any interest payments until the maturity date, thus the *put* option plays a role of a "sweetener" for the investors which compensates them for the lack of coupon payments.

The companies very often decide to attach the two options - the *call* and the *put* - to ordinary convertibles at the same time. They aim to make the instrument more profitable for both sides: the issuer and the bondholder. Such a security is called a *put/call convertible*.

4. Sample description and methodology

The main aim of our empirical research is to characterize the issuers of particular types of convertible bonds: ordinary convertibles (hereafter: CB) and put/call convertibles (hereafter: P/C CB) and to show potential differences among these two populations. It should be noted that unlike the previous studies, our analysis concerns companies operating only in the American market. The data for the research has been collected from the Bloomberg Database.

We began our research by singling out 2,564 American issuers of hybrid debt between 2002 and 2011. We next removed the issues carried out by financial institutions, as they use hybrid securities mostly for optimizing their capital structure as required by the financial supervision regulations, hence including financial institutions in our sample could lead to false conclusions and misleading generalizations. Afterwards, we removed the issuers of the convertibles with solely a *call* option (*callable convertibles*), solely a *put* option (*putable convertibles*) and *sinkable convertibles*.[3] Thus, only the issuers of *CB* and *P/C CB* were left in the sample. Unfortunately, a part of data regarding some companies was incomplete (e.g. no specific information about conversion price or conversion ratio), and hence we could not include them in our analysis. In the end, the final sample consisted of 379 companies: 206 *CB* issuers and 173 *P/C CB* issuers.

The next step was to create 16 financial indicators which allow us to show the characteristics of the analyzed issuers and demonstrate a potential differentiation among them. We mainly focused on indicators concerning:

1. Issue value to certain companies' balance sheet items (e.g. issue value/total assets) (see Table 1; Panel A);

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[3] A *sinkable convertible* is a convertible bond which is backed by a so-called *sinking fund,* which ensures the bondholders that the bond's par value and all interest payments will be repaid and thereby protects them from the issuer's bankruptcy. *Sinkable convertibles* reduce the interest rates of newly-issued securities.

2. Their asset and capital structure (e.g. equity/total assets; equity/total interest and liabilities) (see Table 1; Panel B);

3. Their profitability and performance (i.a. ROA, ROE, EBIT/revenues) (see Table 1; Panel C).

The selection of these definite indicators is not coincidental. The analysis of issue value to specific assets and liability elements helps us answer the question whether there is any connection between the choice of certain convertible types or the issuer's size. It may turn out that the P/C CB issuers are small enterprises which can make use of the high flexibility of such instruments. Depending on the market conditions, financial performance of the company, and the value of its future investment options, exercising the *call* option may enable the small issuers to force conversion and thereby increase equity. Adding the *put* option to the convertible bond, in turn, may facilitate the companies to find sufficient investors who will acquire the newly issued hybrid debt. This is particularly important for SMEs, which very often decide do carry out a private placement by selling their securities to a small number of chosen investors. The amount of the issue may be also associated with the value of total assets, especially tangible assets, which are potential collateral for the issue. In order to verify this hypothesis we carry out an analysis of the issuers' asset structure.

Furthermore, it is also possible that the P/C CB issuers (presumably SMEs) are characterized by a higher level of indebtedness. It cannot be ruled out that SMEs take advantage more often than usual of financial leverage for multiplying their profitability. They may be in the initial phase of their development and do not have a sufficient amount of equity to finance new investment projects. For this reason, we examine several indicators of the issuers' capital structure and the level of the their financial leverage. In addition, the level of debt is strongly associated with a firms' ability to repay coupon payments on time. It would seem that companies should avoid issuing P/C CBs if they anticipate a decline in their future cash flows and general deterioration of their financial performance. In such case, when the bondholders exercise the *put* option before convertibles mature, the issuers have to raise cash for early redemption which can lead to financial distress or even bankruptcy.

Our sample was preliminarily analyzed using basic statistical measures, such as arithmetic mean, median, standard deviation, and coefficient of variation. As a result, it was possible to determine the variability of the studied traits within the study groups of issued securities. We than tested the statistical significance of differences between independent populations identified by possible additional options included in the bond structure – with the *put/call* option or without it. Our testing of the significance of differences between groups was conducted using parametric methods (comparing the expected value

of the dependent variable in populations) and nonparametric (comparing the cumulative distribution of the dependent variable distribution in populations).

The first group of tests required to satisfy two premises:

1. Normal distribution of dependent variable in populations distinguished by the levels of factor,

2. The homogeneity of variance of the dependent variable within a population distinguished by the levels of factor.

Normality of distribution was assessed using the Shapiro-Wilk test. Assessment of the variance homogeneity was prepared using the Levene's test. Both of those tests preceded the Student's t-test. Due to the strong skewness of the collected data, the Mann-Whitney test was used as an alternative to the t-test for dependent samples in case of failure of the assumption of variable distribution normality. This test requires at least an ordinal level of the dependent variable measurement. It is used to compare two independent populations. Since the null hypothesis assumes that two independent samples come from populations of the same distribution, the differences between populations is considered to be statistically significant if the probability of the Mann-Whitney test is lower than the level of significance α.

The null hypothesis is:

H$_0$: $F_1 = F_2$ towards H$_1$: $\sim$ H$_0$, where F$_1$ and F$_2$ are the distributions of the dependent variable probability distributions in the compared populations. The verification of the test is the statistic (Szymczak 2010, pp. 198-200):

$$Z = \frac{U - \frac{1}{2} \cdot n_1 \cdot n_2}{\sqrt{\frac{n_1 \cdot n_2}{n \cdot (n-1)} \cdot \left[\frac{n^3 - n}{12} - \Sigma \frac{t_i^3 - t_i}{12}\right]}} \qquad (1)$$

where:

$$U = n_1 \cdot n_2 + \frac{n_1 \cdot (n_1 + 1)}{2} - R_1$$

$n = n_1 + n_2$, t – number of observations related to the rank

R$_1$ – sum of ranks for the first sample.

The Z statistics has a normal distribution with the parameters 0 and 1. Since the null hypothesis assumes that two independent samples come from populations with the same distribution, the differences between populations were considered as statistically significant if the probability of the Mann-Whitney test was lower than the level of significance α.

The statistical analysis was supplemented by logistic regression. This made it possible to estimate the probability of issuing traditional convertible bonds when possible determinants (explanatory variables) are defined. Therefore the result is a binary variable, expressed as "1-0", where, where 1 means the convertible bonds traditional issuance, while 0 - the opposite situation.

Th logistic regression equation is (Szymczak 2010, p. 171):

$$P(Y = 1) = \frac{1}{1 + \exp(-(-B_0 + B_1 X_1 + ... + B_n X_n))} \tag{2}$$

The model parameters were estimated using the maximum likelihood method and the assessment of the model quality included:

1. The omnibus test of model coefficients, which allows to check whether any variable from the adopted set of explanatory variables may be estimated as a probable important determinant. The null hypothesis is: H_0: $B_1 = … B_k$ towards H_1: ~ H_0. If the probability of the test is lower than the assumed level, it was considered that at least one of the explanatory variables significantly determine the probability of traditional convertible bonds issuance;

2. Evaluation of the classification accuracy - the quality of the classification is normally accepted if at least 95% of the cases when Y = 1 and at least 90% of the cases when Y = 0 are correctly classified.

To assess the contribution of the model predictors, the Wald statistic was examined. It helped to assess the significance of particular coefficients and support the conclusions from the Mann-Whitney test analysis.

5. Research results

The results of our research are provided in Table 1. In general, they show a high diversity of investigated characteristics among each group of issuers. This is proved by high values of standard deviation and significant differences between mean and median values. However, it is difficult to unequivocally claim which of the population (the P/C CB or CB issuers) is more differentiated.

Table 1. Statistical analysis of the sample. Key findings

Ratio	Convertible type	Mean	Median	Standard Deviation	p-value
Panel A: Issue value to selected balance sheet elements					
Issue value/Total assets (1.)	P/C CB	3.165	6.874	16.489	0.032**
	CB	2.117	6.712	8.127	
Issue value + Long-term liabilities/Total assets (2.)	P/C CB	6.696	6.988	2.736	0.135
	CB	6.649	6.845	2.215	
13.490	0.042**	3.130	0.159		
	CB	2.440	0.357	6.843	
Issue value/Long-term liabilities (4.)	P/C CB	11.169	0.617	58.417	0.006**
	CB	19.645	0.932	81.985	
Panel B: Asset structure and capital structure ratios					
Equity/Total assets (5.)	P/C CB	0.477	0.478	0.215	0.572
	CB	0.489	0.488	0.217	
Equity/Interest expenses (6.)	P/C CB	2.556	1.605	2.956	0.520
	CB	2.612	1.635	2.793	
Equity/Tangible assets (7.)	P/C CB	0.675	0.612	0.549	0.630
	CB	0.688	0.624	0.477	
Equity + Long-term liabilities/Tangible assets (8.)	P/C CB	0.928	0.844	0.467	0.976
	CB	0.928	0.832	0.427	
Financial leverage (9.)	P/C CB	2.328	0.443	14.383	0.068*
	CB	5.779	0.75	15.952	
Debt/EBITDA (10.)	P/C CB	1.609	1.240	1.292	0.057*
	CB	1.510	0.992	1.387	
Odsetki / EBITDA (11.)	P/C CB	0.168	0.135	0.119	0.075*
	CB	0.147	0.119	0.107	
Panel C: Profitability and performance ratios					
EBIT/Revenues (12.)	P/C CB	0.147	0.104	0.14	0.366
	CB	0.135	0.095	0.122	
Total assets/Revenues (13.)	P/C CB	14.831	1.654	132.897	0.241
	CB	16.171	1.418	108.583	
Tangible assets/Revenues (14.)	P/C CB	8.155	1.197	87.71	0.019**
	CB	14.931	0.923	108.375	
ROE (15.)	P/C CB	0.176	0.076	0.856	0.649
	CB	0.178	0.071	1.032	
ROA (16.)	P/C CB	-0.017	0.037	0.248	0.094*
	CB	-0.064	0.016	0.225	

p-value - the probability of the Mann-Whitney test
* - statistically significant differences at $\alpha=0,10$
** - statistically significant differences at $\alpha=0,05$

Source: own elaboration.

Looking at the research findings more precisely, it is apparent that the issue value to total assets (1.) and the issue value to tangible assets (3.) are lower for the CB issuers compared to the companies issuing the P/C CB (see Panel A). Moreover, for both groups of companies the hybrid debt makes up a majority of their long-term liabilities (2. and 4.), which means that convertible bonds are their primary resource of outside capital. According to (1.), the level of indebtedness increases more in case of the P/C CB issuers, but on the other hand (4.) proves that the firms which decide to issue the CB incur more long-term debt. This implies that the C/P CB issuers may either pursue more cautious financial strategies or they may be smaller entities in comparison with the companies issuing CB.

This then begs the question why smaller enterprises are more willing to add *call* and *put* provisions to ordinary convertible securities. Basically, it is a matter of perceiving these options as very profitable for both issuers and bondholders. The *call* option enables the companies to act more flexibly depending on market conditions, their financial performance, or the value of their future investment options. The managers can either force conversion or redeem convertibles at par, both before and at maturity. The *put* option, in turn, guarantees the bondholders the right to have the bonds redeemed in any cases of companies' financial distress or when the bond owners do not want to participate in too risky investment projects. In other words, the put option may serve as a "sweetener" for the investors which compensates them for uncertainty regarding issuers' future financial results and potential activities.

Hence, the P/C CB issue may indicate a limited confidence of the investors toward the issuers, which is quite common among small companies. The differences in (3.) are the proof of that. The P/C CB issue is secured by a lower level of tangible assets, which is associated with higher risk for the bondholders. Therefore it can be assumed that adding the *call* and *put* provisions may be managers' attempt to reduce such risk in order not to increase the cost of raising capital, which can considerably hinder the value of outside financial resources.

Admittedly, the research results show a strong differentiation among the investigated populations, but on the other hand it does not have an unitary character. For example, the mean value of (3.) and (4.) exceeds its median value whereas in (1.) it is exactly the opposite. But despite such a high differentiation, all the differences between both groups of the issuers, except for (2.), are statistically significant.

The analysis of the findings with respect to differentiation in capital structure of the CB and the P/C CB issuers does not allow for formulating many generalizations (see Panel B; 5.-8.). None of the differences in the investigated

ratios are statistically significant, hence there are no significant differences among the two groups of issuers, which is clearly proved by the Mann-Whitney test. An adequate equity to tangible assets ratio is observed (7.), whereas the constant capital to tangible assets ratio is thought to be too low (8.), which, in the case of the P/C CB issuers, is further evidence of pursuing a cautious financial strategy. However, the first statistically significant differences are noted in connection with the test of the issuers' financial risk. It turns out that the CB issuers are exposed to less risk - they have a lower level of (10.) and (11.) - but on the other hand they can benefit more from financial leverage (9.). This means that the P/C CB issue may apply to companies with higher risk exposure, and adding the *call* and *put* options to ordinary convertibles may stem from the requirements of the investors. This conclusions are consistent with the previous observations.

It can be observed that the P/C CB issuers are more exposed to risk. Their convertible issues have more impact on the total liabilities structure (1.) than on the long-term-liabilities structure (4.). The operating performance of such firms is much more laden with the costs of outside financing. Hence, an additional debt issue significantly increases their risk exposure.

Serious consideration should also be given to the profitability ratios (see Panel C). The research findings show that the companies issuing the CB achieve relatively worse financial results in comparison with their P/C CB counterparts. However, it should be emphasized that observed differences do not give us the basis to make any generalizations. Although the P/C CB issuers are characterized by a higher return on assets (16.), the mean and median values suggest a high differentiation among each group. The average profitability is negative, whereas the half of the firms do not incur a loss. This arises from several significant negative ROAs in our sample. As for ROE, the results are almost identical (15.). For this reason, return on equity may not affect the decision whether to attach *call* and the *put* provisions to ordinary convertibles. This is also proved by Mann-Whitney test values. In turn, in the case of ROA the differences are statistically significant but they are barely within the accepted confidence intervals.

The research findings about the effectiveness of the issuers are ambiguous as well. The statistically significant differences are observed only for tangible assets turnover (14.). The P/C CB issuers appear to be more effective on average, but half of them achieve worse results than the companies that issue CB. In case of total assets turnover (13.) and the effectiveness of operating performance (12.), these ratios are close to each other, which results in their statistical significance.

Using some characteristics of the convertible bonds issuers an assessment of the P/C CB issuance likelihood was carried out. For this purpose logistic regression was used. As the explanatory variables, we took into consideration only the parameters previously shown as statistically significant for the differences between the CB and the P/C CB. The analysis was focused on following parameters: (1), (3), (4), (9), (10), (14), (16). An outcome variable is a dummy variable equals 1 for the P/C CB bond, 0 - for the other.

Table 2. The results of the logistic regression model estimation describing the probability of the P/C CB bond issuance

Explanatory variable	B	S(B)	Wald statistic	exp(B)	R^2_{Nag}
Intercept	4.012	0.441	61.249	37.847	0.7149
Debt/EBITDA	0.002	0.000	59.843	1.008	
Issued amount/fixed assets	0.001	0.000	53.678	1.003	
Fixed assets/revenues	0.024	0.009	12.001	1.004	

R^2_{Nag} – Nagelkerke's R squared

Source: own elaboration.

Among all the considered factors, three parameters had the most important influence on the probablility of P/C CB issuance: issued amount relative to fixed assets, fixed assets to income. and debt/EBITDA ratio. The debt/EBITDA ratio is associated with a probability of the P/C CB issuance 1.008 times higher. An increase of the issued amount in relation to non-current assets by 1% increases the probability P/C CB issuance average of 1.003-fold (ceteris paribus). Growth of the fixed assets/revenues ratio by 1% causes the probability of the P/C CB issuance to be higher on average by 1.004 times. The estimated model correctly classified 96.1% of the P/C CB and 82.3% of the remaining bonds.

The results confirm previous observations. The increase of investment risk makes firms more likely to add an early redemption option to offered convertible bonds. The more debt relative to EBITDA or issued amount uncovered by owned fixed assets, the higher the risk for a potential bond investor. An interesting role can be observed with respect to fixed assets. Their scarcity limits the ability to secure investors, therefore P/C CB is more probable. On the other hand, an excess of fixed assets results in their low efficiency, which also increases the probability of issuance of a convertible bond expanded by additional options.

6. Conclusions

The issuance of convertible bonds can effectively alleviate tensions between investors and managers of a company. Adding the option of early redemption increases the range of possible agreement between them. It also gives the ability to change the terms of financing during the bond's lifetime. It may be particularly important in case of higher-than-average risk exposure of a company. It is also worth noting that regardless of the option type – *call* or *put*, the decision about a conversion is made by the investors, which means that they have a great impact on the choice of the final form of the hybrid capital financing. If the bondholders decide to withdraw the invested capital before debt maturity, they will demand the early redemption of convertibles by exercising the *put* option. If the right of redeeming convertibles falls to the issuer (the *call* option), the investors will simply not decide to make conversion. However, if the bondholders regard the overall market conditions and the issuer's financial performance as favorable and thereby wish to subscribe for the underlying shares, they will choose a conversion in case of both *callable* and *putable* convertibles. In each scenario, the *put/call* provisions gives the investors a greater influence on the convertible bonds financing until their maturity.

Our research shows that the main factor which determines the use of the *put/call* convertibles is the financial risk of the issuer. Although the companies issuing ordinary convertibles and those with additional *put/call* provisions are very similar by virtue of their financial characteristics, we confirmed some differences between both groups. In general, they concern the operating performance and interest payments to debt, which indicates that the P/C CB issuers are more exposed to the financial risk. This is also proved by the higher value of issued convertibles relative to total assets and fixed assets, which are potential bond collateral. We can therefore assume that the convertible *put/call* extension is strongly associated with the above-mentioned differences. Adding the *call* and the *put* option to ordinary convertibles may be explained by the issuers' attempt to reduce their risk exposure. As a consequence, the investors have a greater impact on the financing process, able to make optimal decisions based on the current financial performance of the firm. Thus, the use of PC CBs may facilitate raising outside capital and contribute to reducing the expected rate of return. The use of the *put/call* options in issues of higher risk is consistent with the theory of financing under imperfect market conditions and is strongly related to business practice. The information asymmetry between investors and managers favours the application of hybrid financing. The bondholders can adjust their capital commitment depending on the risk involved. The early redemption options may appear to be especially beneficial in such a case.

Finally, it should be emphasized that convertible bonds are issued in different countries, which may vary in terms of their formal regulations or financial supervision. For that reason, the characteristics of convertibles issuers in each country may be different. Our research applies only to the U.S. market. It therefore seems that broader generalizations require a broader study. Most previous research on *put/call convertibles* has concentrated mostly on the securities issued all over the world, without a division into specific countries or certain economic sectors. Some of them are focused mainly on the bond premiums (e.g. Greiner *et al.*, 2002) or particular issuance parameters. The the best of our knowledge, there are no articles concerning the characteristics of the *put/call convertibles* issuers showing the differences among them across several countries. This is a research gap which should be further investigated.

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Streszczenie

DETERMINANTY EMISJI OBLIGACJI ZAMIENNYCH Z OPCJĄ PUT/CALL NA RYNKU AMERYKAŃSKIM. ANALIZA SEKTORA NIEFINANSOWEGO

Celem artykułu jest scharakteryzowanie i wykazanie różnic między emitentami zwykłych obligacji zamiennych i obligacji zamiennych z dołączoną opcją put/call. Badanie zostało przeprowadzone na podstawie 379 emitentów tych instrumentów na rynku amerykańskim w latach 2002-2011 spoza sektora finansowego. Okazuje się, że decyzje o emisji put/call convertibles podejmują spółki obarczone wyższym ryzykiem inwestycyjnym, o czym świadczy m.in. wyższy poziom zadłużenia czy gorsza relacja wartości emisji to wartości aktywów trwałych. Dołączenie opcji call/put do zwykłych obligacji zamiennych ma na celu obniżenie ryzyka inwestycyjnego emitenta, co może spowodować zwiększenie popytu na ten rodzaj papierów wartościowych ze strony inwestorów.

Słowa kluczowe*: finansowanie, obligacje zamienne, klauzule put/call, rynek amerykański*