# ANNOUNCEMENT EFFECTS OF CONVERTIBLE BOND LOANS VERSUS WARRANT-BOND LOANS: AN EMPIRICAL ANALYSIS FOR THE DUTCH MARKET

by

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First draft: January 20, 1995

<sup>&</sup>lt;sup>\*</sup> The authors are indebted to Frank de Jong, Theo Nijman and seminar participants at Tilburg University for helpful comments and suggestions and to Leon van Esseveldt and Bas Rooijmans for their research assistance. The usual disclaimer applies.

# ANNOUNCEMENT EFFECTS OF CONVERTIBLE BOND LOANS VERSUS WARRANT-BOND LOANS: AN EMPIRICAL ANALYSIS FOR THE DUTCH MARKET

#### Abstract

This study investigates the announcement effects of offerings of convertible bond loans and warrant-bond loans using data for the Dutch market. Using standard event study methodology it is found that on average stock prices show a positive but insignificant abnormal return for the announcement of a convertible bond loan and a significant positive abnormal return for the announcement of a warrant-bond loan. These findings contrast with studies for the United States which generally find significant negative abnormal returns for convertible bond loans and negative but no significant abnormal returns for warrant-bond loans. This can be explained by the fact that Dutch companies generally package these announcements with other (good) firm specific news. Using regression analysis, in which the amount of new equity and new debt involved in the issue are taken into account, it is found that shareholders react more positively to the announcement of warrant-bond loans than to the announcement of convertible bond loans.

# 1. Introduction

In making their capital structure decisions firms can choose to issue securities which have both equity and debt components rather than to issue pure equity or debt. Both convertible bond loans and warrant-bond loans share this characteristic. Studies of announcement effects with regard to convertible bond loans (from now on CBs) and warrant-bond loans (from now on WBs) confirm the hybrid nature of these finance instruments. Dann and Mikkelson (1984) present a summary table of the relevant literature which shows the following results. First, the issuance of new debt does not lead to any significant stock price reaction. Second, the issuance of new equity leads to a significantly negative stock price reaction. Finally, the issuance of a CB, which has elements of both debt and equity, leads to a significant stock price decline which is smaller than the decline associated with the issuance of pure equity. As far as we know announcement effects of hybrid debt instruments have sofar only been investigated for the United States. In this paper we will investigate these announcement effects for another capital market, i.e. the Dutch capital market.

First we take a closer look at previous studies in which the reaction of shareholders on announcements of CBs and WBs is measured. In these studies the common stock returns on the day before the announcement is published in the financial press (day -1) and the announcement day itself (day 0) are calculated. These are corrected for the "normal returns" on the same stock. The resulting differences are the abnormal returns caused by the announcement. In table 1 the cumulative average abnormal returns for days -1 to 0 as found in these studies are summarized.

## [Insert Table 1]

From table 1 it can be concluded that all studies find significant negative stock price reactions to announcements of CBs. The fact that all studies find a significant negative effect is not surprising because all the studies use at least partly the same data-set, i.e. announcements of the issuance of CBs in the United States. Differences between these cumulative abnormal returns can be explained from differences in the research period, the sample selection criteria and the event period. The results for WBs are mixed. Long and Sefcik (1990) find a significant negative stock price reaction, while Jayaraman et. al. (1990) and Billingsley et. al. (1990) find negative, but insignificant, stock price reactions. This leads Billingsley et. al. (1990) to conclude that by using WBs firms have a 'penalty-free' issuance of an equity-like security. The term 'penalty-free' is used because normally the issuance of new equity is followed by a decline in the stock price.

In this study announcement effects of CBs and WBs are investigated for the Dutch capital market. These effects are studied for 47 CBs and 19 WBs issued from 1976 to 1994. The event study analysis leads to a positive but insignificant effect on the stock price for the announcement

of a CB and to a significant positive effect for the announcement of a WB. These results are contrary to results for the United States. We attribute these remarkable results to the fact that firms "package" these announcements with other (good) firm specific news. Using regression analysis we also investigate whether shareholders react differently to announcements of CBs or WBs. In these regressions issue specific characteristics are taken into account. This analysis shows that the market reacts more positively to announcements of WBs than to announcements of CBs and that this difference can not be explained by differences in issue specific characteristics. The more positive effect of WB announcements is in line with Billingsley et. al. (1990) who also find that shareholders react more positively to announcements of WBs in relation to CBs.

The remainder of this paper is structured as follows. In section 2 the event study analysis is presented. Section 3 investigates the different announcement effects of WBs and CBs using a regression analysis. Finally, in section 4 a summary and conclusions are presented.

## 2. Event study analysis

# Data

We use the announcements of CBs and WBs that were issued by Dutch companies from January 1976 to December 1994 and which have been listed on the Amsterdam Stock Exchange (ASE). During this period a total of 59 CBs and 22 WBs were issued. From this sample we eliminated 11 CBs and 3 WBs because the announcement of these issues was accompanied by the announcement of the issuance of shares or warrants (for cash). One CB was eliminated because not enough data in the pre-event period were available. Therefore we are able to use 47 announcements of CBs and 19 announcements of WBs. The announcement date is the first date at which the announcement appears in the Dutch daily financial newspaper *Het Financieele Dagblad*. Stock price data are derived from Datastream and *Het Financieele Dagblad*.

#### **Event study methodology**

In order to test whether the announcement effect of WBs differs from the effect of CBs we use a standard event study methodology as described in Brown and Warner (1985). Excess returns are measured using an Ordinary Least Squares market model regression:

$$A_{i,t} = R_{i,t} - \hat{\beta}_{0,i} - \hat{\beta}_{1,i}R_{t}^{M}, \qquad (1)$$

where A<sub>i,t</sub> is the excess return for firm i at day t and where R<sub>i,t</sub> denotes the return on security i at

day t, defined as  $\ln(P_{i,t})$  -  $\ln(P_{i,t-1})$ , and where  $R_t^M$  is the return on the market index, which is measured in a similar way as  $R_{i,t}$ . The market index chosen is the Datastream index for the Dutch market, since this is the only index for which data are available for the whole sample period. The parameters  $\hat{\beta}_0$  and  $\hat{\beta}_1$  are estimated over the estimation period by running an OLS regression of the stock returns on a constant and the return of the market index.

Denoting the announcement date with t=0, this estimation period ranges from t=-110 to t=-10. The event window ranges from t=-1 to t=+1<sup>1</sup>. The test statistic is calculated following the methodology as outlined by Brown and Warner (1985, page 7):

$$\overline{A}_t/\widehat{S}(\overline{A}_t),$$
 (2)

where  $\bar{A}_t$  is the average abnormal return over the N different firms on day t and  $\hat{s}(\bar{A}_t)$  is the standard deviation of the average abnormal return obtained from the estimation period. The null-hypothesis is that the test statistic is zero. If the null-hypothesis holds and if the abnormal returns are independently identically distributed with finite variance, the test-statistic is asymptotically normally distributed. Besides calculating excess returns for each day in the event period, we also calculate cumulative average abnormal returns<sup>2</sup>. Finally, to take into account the fact that the standard error of the returns will be different for different firms, implying that the abnormal returns of different firms will not be identically distributed, standardized abnormal returns are calculated as well.

## Event study results

The results of the event study are presented in table 2. This table contains the average abnormal returns for day -1 to day +1 around the announcement date, as well as the cumulative average abnormal returns for this event period.

# [Insert Table 2]

It can be seen from table 2 that the average abnormal stock returns from day -1 to 1 are positive but insignificant for both CBs and WBs. Cumulative abnormal returns are not significant for CBs but they are significantly positive for WBs. The latter effect becomes stronger if

<sup>&</sup>lt;sup>1</sup> Several other estimation and event periods are tried as well. However, the results appear to be robust with respect to the length of the estimation period as well as the event period, except that there is no further announcement effect after day +1.

 $<sup>^{2}</sup>$  In calculating the test statistic for the cumulative abnormal returns it is assumed that excess returns are not autocorrelated, so that the variance of a two-day excess return is just the sum of the variances of the corresponding one day returns.

standardized returns are considered<sup>3</sup>. Because these results are contrary to the results presented in table 1, we have examined them in more detail. An important finding is that Dutch companies generally surround the news of an issuance of CBs or WBs with other (good) news. A number of announcements are made together with the publication of the provisional or definite annual results (11 CBs and 2 WBs). In the other cases the announcement is accompanied by the publication of the issuance prospectuses and/or the presentation of the contents of the issuance prospectuses. Besides technical details about the issue, these prospectuses include a great deal of other information about the firm and its future prospects.

An interesting example is the case of the issuance of a CB of 300 million Dutch guilders in February 1994 by the Dutch transport concern Nedlloyd. This issue was first announced in the Dutch financial newspaper *Het Financieele Dagblad* on February 8, 1994 (day 0). The abnormal returns on respectively days -1, 0 and 1, with t-values between brackets, are -0.52% (-0.26), +6.98% (3.41) and +2.41% (1.10). This leads to cumulative abnormal returns on day 0 and day 1 of respectively +6.45% (2.23) and +8.86% (2.50). On February 14, 1994 an editorial comment in *Het Financieele Dagblad* makes the following statement about these announcement effects (literally translated):

"Meijer (the chairman of the Board of Nedlloyd) has packaged his message in good news. Much earlier than usual, he has brought out his provisional results for 1993 as well as his global prognoses for 1994".

Two weeks after the issue announcement, on February 22, 1994, Nedlloyd announced its intention to increase the size of the issue from 300 to 400 million Dutch guilders. At this time there was no more good news to surround the announcement with. The market reacted accordingly. If we take February 22, 1994 as day 0, the abnormal returns on day -1, 0 and 1 are respectively - 3.83% (-1.87), -2.33\% (-1.14) and +0.16\% (0.08). The cumulative abnormal returns on day 0 and 1 are respectively -6.12% (-2.13) and -6.00% (-1.70). Unfortunately our sample only includes a few issue size increases. Therefore a more profound study of this effect is not possible.

There is almost no issue in our sample that is not surrounded with announcements of good news. Therefore it is not possible to correct for this by splitting the sample or by using a dummy variable for good news in a regression analysis. The effect of surrounding announcements of CBs and WBs with other (good) news seems to be less relevant for the United States. For example, Brennan and Her (1993) study a sample of 155 CBs. This sample is drawn from an initial sample

 $<sup>^{3}</sup>$  Table 2 also presents sign-tests to investigate whether there are more positive than negative returns on an event day. Under the null-hypothesis that the event does not have any effect, there should be as many positive as negative returns, i.e. the percentage of positive returns should be equal to 50%. This hypothesis is never rejected.

of 682 CB offerings. From this sample only 56 issues were eliminated because the offering was announced in conjunction with other company news (or because the offering was not announced in the *Wall Street Journal*). A reason for this may be that an issue of CBs or WBs is a real "event" in a small capital market such as the one in the Netherlands. When a company announces an issue of CBs or WBs it can be sure to attract enough attention by the financial press. Therefore it may be more worthwhile to surround the announcement by good news.

From table 2 it can also be concluded that the announcements of WBs are followed by significant positive returns, while this is not the case for CBs. This is in line with Billingsley et. al. (1990) who also find that WBs are more favorably received than CBs. Table 2 also reports a test for the significance of the difference between the cumulative average abnormal returns of CBs and WBs. The test is a t-test for a zero difference between the cumulative average abnormal returns, using non-pooled standard deviations. This test does not indicate any significant difference between the two announcements. However, in order to investigate the difference in effects between issuances of CBs and WBs, also possible differences between CBs and WBs should be taken into account. The next section further investigates this topic.

## 3. A comparison of CBs and WBs

## The equivalences and differences between CBs and WBs

Jones and Mason (1986) and Finnerty (1986) demonstrate that WBs can be constructed in such a way that they are identical to CBs. According to these authors the only thing that remains is that in such a case WBs are more favorable for companies in the United States, because of tax considerations. In the Netherlands there are no tax differences between CBs and WBs (Veld, 1994). Although these two forms of securities can be structured in such a way that they are in fact identical, in practice some differences can be observed. The main difference is that WBs are separately traded securities, while in case of CBs, the bonds and the conversion right are always traded together. Therefore, the warrants and the bonds are also separately redeemable, while this is not the case for the bonds and the conversion rights. Another main difference is that conversion rights are exercised by redeeming the accompanying bond, while warrants are exercised for cash<sup>4</sup>. For the remainder the extent to which CBs and WBs differ is mostly an empirical matter. Two important differences will be considered for our sample of 47 CBs and 19 WBs.

<sup>&</sup>lt;sup>4</sup> In the United States also warrants exist, which may be exercised using the accompanying bonds (see Jones and Mason, 1986). In the Netherlands such warrants have not yet occurred (see Veld, 1992, page 31).

First we consider the ratio of new equity to be issued upon conversion or warrant exercise  $(\hat{S}_t)$  and the average market value of equity 15 to 11 days before the announcement  $(S_{t-15,t-11}, \text{ from})$  on to be referred to as the market value of equity). This ratio is defined as  $S_{new}$ . We take the average market value of equity 15 to 11 days before the announcement in order for the stock price not to contain any announcement effects of the issue itself. The market value of equity is determined by multiplying the number of outstanding shares (derived from the respective issuance prospectuses) by the average share price of 15 to 11 days before the announcement (derived from Datastream or *Het Financieele Dagblad*). The ratio  $S_{new}$  is on average 21.7% for CBs while it is only 15.5% for WBs.

We also calculate the ratio of new equity  $(\hat{S}_t)$  and the nominal value of new debt at the issuance  $(\hat{B}_t)$ . This ratio is defined as SB. In case of CBs, this ratio is usually equal to 1. Only if the issuing company includes a provision that upon conversion an additional payment is required, or on the contrary a repayment is granted, the ratio will be different from 1. In case of WBs there is a priori no reason to determine a ratio SB of 1, because after the issuance the bonds and warrants are separated. Long and Sefcik (1990) find a ratio of 65% for WBs issued in the United States. The ratio SB is calculated for the CBs and WBs in our sample. Not surprisingly this ratio is on average 100% for CBs. For WBs this ratio is 94%. This is lower than the ratio for CBs, but much higher than the ratio for WBs issued in the United States. For the WBs in our sample the ratio SB varies from 20% to 148%. Moreover it is never equal to 100%.

In summary, although WBs can be constructed in such a way that they are in fact identical to CBs, in practice these two kinds of securities are structured in a somewhat different way. This is the case both for securities issued in the United States and for securities issued in the Netherlands.

#### **Regression analysis**

If we want to investigate the differences in the announcement effects of WBs and CBs, we should take the differences between the structure of these securities into account. In order to do so, we estimate the following regression equation:

$$CAR_{i}^{1} = \beta_{0} + \beta_{1} S_{new,i} + \beta_{2} SB_{i} + \beta_{3} dum_{i} + \varepsilon_{i}, \qquad (3)$$

where:

 $CAR_{i}^{1} =$  the Cumulative Abnormal Return for firm i on event-day +1.  $S_{new,i} =$  the maximum amount of new equity relative to the market value

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the maximum amount of new equity relative to the market value of the equity.

$SB_i$	=	amount of new equity as a fraction of new debt.
dum <sub>i</sub>	=	dummy variable which is 0 for CBs and 1 for WBs.

The aim here is to explain the cumulative abnormal return on event day +1 from two variables which are supposed to measure structural differences between individual issues and a dummy variable that is supposed to measure the effect of WBs versus CBs over and above the structural differences between the issues.

The null-hypothesis is that  $\beta_3 = 0$ . This would mean that shareholders do not perceive CBs and WBs to be inherently different. Using a Pecking Order framework and the summary of empirical research on the announcement effects of capital structure changes presented in Dann and Mikkelson (1984), we can make hypotheses for the other two explanatory variables. According to the Pecking Order Theory firms prefer to finance new projects with internal capital. If firms have to raise external capital then they prefer to issue new debt first and they prefer to issue new equity last. Myers and Majluf (1984) give an explanation for this behavior assuming that management has more information about the firm's value than potential investors. One of the conclusions by Myers and Majluf (1984) is that when managers have superior information, the stock price is expected to fall when new equity is issued, while it is not expected to fall when new debt is issued<sup>5</sup>. For our purposes, this conclusion is most important.

The first variable  $S_{new}$  measures the maximum amount of new equity involved in the issue in relation to the existing amount of equity. Since the issue of common stock is usually received with a negative reaction by existing shareholders, it is expected that  $\beta_1$  will be negative. This would be in line with The Pecking Order Theory.

The second variable SB measures the amount of new equity in relation to the amount of new debt. Since Dann and Mikkelson (1984) find, in line with the Pecking Order Theory, a negative relation for the announcement of new equity and a zero relation for the announcement of new debt, we expect that the coefficient  $\beta_2$  will also be negative.

A last point to mention is that simply using OLS to estimate equation (3) will probably not be very efficient. Since the abnormal returns are calculated as the residuals from the market model in (1), they essentially measure the nonsystematic risk of the firm. Since nonsystematic risk will be different for different firms, the variance of the error term in (1) will not be the same for each i. The error term in (3) also (in part) reflects this nonsystematic risk. Therefore, this will have as a consequence that the variance of the error term in (3) is not constant over i either. In other words, the error terms in (3) are heteroskedastic.

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<sup>&</sup>lt;sup>5</sup> This is conclusion 5 of their paper. See Myers and Majluf (1984, page 220).

Note that we have an estimate of the nonsystematic risk of firm i from the estimation period in the event study. The estimation period from t=-110 to t=-10 yielded an estimation  $\hat{\sigma}_i^2$  which we can now use in a Generalized Least Square (GLS) framework to obtain more efficient estimates of (3). The procedure used is to weigh all dependent and independent variables in (3) with the inverse of  $\hat{\sigma}_i$ , as outlined in Judge et al. (1988, page 359). Thus, in effect we estimate the following equation:

$$\frac{CAR_i^1}{\hat{\sigma}_i} = \beta_0 * \frac{1}{\hat{\sigma}_i} + \beta_1 * \frac{S_{new,i}}{\hat{\sigma}_i} + \beta_2 * \frac{BS_i}{\hat{\sigma}_i} + \beta_3 * \frac{dum_i}{\hat{\sigma}_i} + u_i$$
(4)

where  $u_i = \varepsilon_i / \hat{\sigma}_i$ . The variance of the error term  $u_i$  is not assumed to be scaled to 1 by this procedure, but is estimated in the regression. We will now turn to the results and their interpretation.

#### **Regression analysis results**

To answer the question whether shareholders react differently to the issuance of CBs in relation to WBs, we estimate equation (3) using GLS. The results of this regression are given in table 3.

## [Insert Table 3]

The variables  $S_{new}$  and SB are expected to give negative coefficients. Contrary to our expectations this turns out not to be the case for both variables. In both cases positive, but not significant, values are found for these variables<sup>6</sup>. Therefore these results do not confirm the Pecking Order Theory.

Finally the dummy variable tests whether there is a difference between CB issues and WB issues after accounting for structural differences between individual issues. This appears to be the case. The coefficient of 0.0168 indicates that the cumulative abnormal return is 0.0168 (1.68%) higher for a WB than for a CB. However, the explanatory power of the regression is very small. This may be caused by the fact that the announcement effects for a great deal are caused by the announcements of other firm specific news. It would probably be more interesting to run these regressions for the samples of Long and Sefcik (1990) and Billingsley et. al. (1990), since the announcement effects studied by them are not, or in any case less, contaminated by other firm specific news than the announcement effects in our sample.

<sup>&</sup>lt;sup>6</sup> We have also run regressions for other variables on which CBs and WBs differ. These regressions included either the average or the maximum maturities of the bonds and the warrants (conversion rights). None of these variables appeared to have a significant effect.

## 4. Summary and conclusions

The outcomes of this study indicate some interesting topics for future research. The first finding of this study is that the announcement of an issue of CBs or WBs is positively perceived by the market. The cumulative average abnormal return for an issue of CBs is 0.53% and even 1.61% for WBs. This contrasts to outcomes of studies for the United States, where announcements of CBs and WBs are more negatively perceived. The reason for this is that in the Netherlands, companies "package" these announcements in other (good) firm specific news. It would be interesting to investigate these effects for other capital markets.

The second finding in this study is that issues of WBs are more positively perceived by the market than issues of CBs. A regression analysis, in which also other issue specific characteristics are included, shows that shareholders receive WBs with a higher cumulative abnormal return of 1.68% in relation to CBs. The regression results also show that other issue specific characteristics, such as the ratio of new equity to existing equity and the ratio of new equity to new debt are not significant. However, the structural differences between CBs and WBs are not very large in the Netherlands, contrary to e.g. the United States. For example, the ratio of new equity to new debt is generally 100% for both US and Dutch CBs, but it is only 65% for WBs issued in the United States, while it is 94% for WBs issued in the Netherlands. Therefore it may also more interesting to run such a regression analysis for samples of CBs and WBs issued in the United States.

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St	udy	Security	Research period	Observations	Cumulative average abnormal return (-1,0)
-	Dann/Mikkel- ( son (1984)	Convertible bonds	1970-1979	132	-2.31%**
-	Mikkelson/ Partch (1986)	Convertible bonds	1972-1982	33	-1.97%**
-	Eckbo (1986) <sup>a</sup>	Convertible bonds	1964-1981	75	-1.25%**
-	Brennan/ Her (1993)	Convertible bonds	1976-1985	155	-2.20%**
-	Long/Sefcik (1990)	Convertible bonds Warrant-bonds	1965-1984 1965-1984	134 54	-0.61% <sup>**</sup> -1.59% <sup>**</sup>
-	Billingsley et. al. (1990)	Convertible bonds Warrant-bonds	1971-1986 1971-1986	104 38	-2.04% <sup>**</sup> -0.33%
-	Jayaraman et. al. (1990)	Warrant-bonds	1977-1986	54	-0.64%

Table 1: Stock price reactions to the announcement of convertible bond and warrant-bond offerings.

<sup>a</sup> = average abnormal return for the first announcements of the issues;
 <sup>\*</sup> = reported by the authors as being significant at the 5%-level;

\* = reported by the authors as being significant at the 5%-level; \*\* = reported by the authors as being significant at the 1%-level.

day:	-1	0	+1
Convertible bond loans:			
AAR:	0.16% (0.69)	0.25% (1.06)	0.12% (0.49)
CAAR:	0.16% (0.69)	0.41% (1.24)	0.53% (1.30)
AAR, standardized:	(0.75)	(0.61)	(0.83)
CAAR, standardized:	(0.75)	(0.96)	(1.27)
Sign-test	45.7% (0.73)	53.2% (0.44)	61.7% (1.60)
Warrant-bond loans:			
AAR:	0.45% (0.96)	0.42% (0.90)	0.74% (1.58)
CAAR:	0.45% (0.96)	0.87% (1.31)	1.61% (1.99)
AAR, standardized:	(1.44)	(1.23)	(2.05)
CAAR, standardized:	(1.44)	(1.89)	(2.73)
Sign-test	57.9% (0.69)	63.2% (1.15)	63.2% (1.15)
difference	(0.60)	(0.68)	(1.31)

Table 2: results from event study on announcement effects of convertible bond loans versus warrant-bond loans

AAR = Average Abnormal Return; CAAR = Cumulative Average Abnormal Return; t-values in parenthese; difference is a t-test for equality of the CAAR's.

Variable:	Coefficient:	t-value
Intercept	-0.0225	-0.98
S <sub>new,i</sub>	0.0070	0.25
SBi	0.0217	0.99
dummy (1 = WB, 0 = CB)	$0.0168^{*}$	1.71
$\mathbf{R}^2$	0.0415	
$\hat{\mathbf{R}}^2$	-0.0057	

Table 3: regression results for abnormal returns (using GLS) Dependent variable =  $CAR_i(-1,+1)$ 

CAR = Cumulative Abnormal Return; S<sub>new</sub> = amount of new equity as fraction of outstanding equity; SB = amount of new equity as fraction of new debt; dummy = dummy which is 1 for warrant-bond loans and 0 for convertible bond loans.