Are There Windows of Opportunity for Convertible Debt Issuance? Evidence for Western Europe

Marie Dutordoir and Linda van de Gucht

ERIM REPORT SERIES *RESEARCH IN MANAGEMENT*	
ERIM Report Series reference number	ERS-2006-055-F&A
Publication	October 2006
Number of pages	28
Persistent paper URL	http://hdl.handle.net/1765/8044
Email address corresponding author	mdutordoir@rsm.nl
Address	Erasmus Research Institute of Management (ERIM) RSM Erasmus University / Erasmus School of Economics Erasmus Universiteit Rotterdam P.O.Box 1738 3000 DR Rotterdam, The Netherlands Phone: + 31 10 408 1182 Fax: + 31 10 408 9640 Email: info@erim.eur.nl Internet: www.erim.eur.nl

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ABSTRACT AND KEYWORDS	
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Free Keywords	Convertible Debt, Hot Markets, Event Study, Western Europe
Availability	
Classifications	

Are there windows of opportunity for convertible debt issuance? Evidence for Western Europe

Marie Dutordoir [a, *], Linda Van de Gucht [b]

[a] *Erasmus Universiteit Rotterdam (EUR), Department of Financial Management, P.O. Box 1738, 3000 DR Rotterdam, The Netherlands.*
[b] *Katholieke Universiteit Leuven, AFI Leuven Research Center, Naamsestraat 69, 3000 Leuven, Belgium.*

Abstract

This paper hypothesizes that hot convertible debt windows represent periods with lower convertible debt-related financing costs. Supporting this premise, we find that the stock price impact of Western European convertible debt announcements is significantly less negative during hot convertible windows. Importantly, this result holds while controlling for equity market, straight debt market and macroeconomic conditions. In addition, stockholders are less sensitive to issuer- and issue-specific financing costs during hot convertible markets. Overall, these findings indicate that hot convertible markets represent windows of opportunity for convertible debt issuance. Firms with high idiosyncratic financing costs act accordingly by timing their convertible offering during a hot market.

Keywords: Convertible debt; Hot markets; Event study; Western Europe

This version: August 2006

* Corresponding author. Erasmus Universiteit Rotterdam, Department of Financial Management, Burgemeester Oudlaan 50, 3062 PA Rotterdam, The Netherlands, tel.: +31-(0)10.408.2786, e-mail address: mdutordoir@rsm.nl.

We thank Lieven Baele, Abe de Jong, Wouter Demaeseneire, Laurie Hodrick, Nancy Huyghebaert, Rezaul Kabir, Igor Loncarski and Piet Sercu for detailed suggestions. We also thank workshop participants at Columbia University, Erasmus Universiteit Rotterdam, Katholieke Universiteit Leuven, Universiteit Maastricht, the 2004 FMA meeting, the 2004 EFMA meeting, the 2004 Belgian Financial Research Forum, and the 2004 Corporate Finance Day Ghent for their insightful comments.

1. Introduction

It is well-documented that convertible debt announcements induce negative abnormal stock returns intermediate between the abnormal stock returns recorded at straight debt and equity announcements.[1] Over the past decades, a number of studies have explored the variables driving cross-sectional differences in the stock price reactions to convertible debt announcements. These papers tend to focus either on the characteristics of the issuing company (Dann and Mikkelson, 1984; Lewis et al., 1999, 2003) or on the convertible debt design (Davidson et al., 1995; Magennis et al., 1998; Burlacu, 2000).

The present paper extends the literature by examining whether, in addition to the issuer- and issue-specific factors studied by previous papers, stockholder reactions to convertible debt announcements are also influenced by convertible debt market conditions. We hypothesize that hot convertible debt markets (i.e., periods with a high convertible debt issuance volume) represent windows of opportunity during which stockholder reactions to convertible debt announcements are systematically less negative. We draw this hypothesis from a rationale developed by Bayless and Chaplinsky (1996) in the context of seasoned equity offerings (SEOs). Bayless and Chaplinsky (1996) argue that, since economy-wide equity-related adverse selection costs vary over time, firms group their SEOs during periods when these costs are low. The aggregate equity issuance volume thus acts as an inverse proxy for the economy-wide level of equity-related financing costs, which implies that it should have a positive impact on SEO announcement returns. In line with this hypothesis, they find that stockholder reactions are significantly more favorable for SEO announcements made during hot equity windows.

A straightforward extension of the Bayless and Chaplinsky (1996) rationale suggests that the aggregate convertible debt volume acts as an inverse measure for the economy-wide level of convertible debt-related financing costs. This in turn yields the main hypothesis examined in this paper, being that stockholder reactions to convertible debt announcements are systematically less negative during hot convertible debt windows. In addition, we predict that the impact of issuer- and issue-specific determinants on convertible debt announcement returns depends on convertible debt market conditions. More particularly, we hypothesize that, if the economy-wide level of convertible debt-

[1] See de Roon and Veld (1998) and Abhyankar and Dunning (1999) for an overview of convertible debt announcement effects recorded by previous studies.

related financing costs is effectively lower during hot convertible debt markets, then issuer- and issue-specific financing costs should have a weaker influence on convertible debt announcement returns during these market conditions.

We test these new hypotheses on a sample of 188 convertibles issued by 154 firms from 13 different Western European countries. While the Western European convertible debt market only gained momentum in the 1990s, it has grown very rapidly since then: in 1990 only 12 Western European industrial firms issued a total of $1.76 billion in convertible debt, whereas in 2002 the number of Western European convertible offerings already amounted to 52 for a total issuance volume of $15.36 billion (source: Thomson ONE Banker).[2] Since the end of the 1990s, there has been a surge in country-specific academic studies calculating the magnitude of convertible debt announcement effects.[3] Our study is the first, however, to analyze the determinants of announcement returns for a pan-Western European convertible debt sample. As shown by Dutordoir and Van de Gucht (2004), Western European convertibles tend to be more debt-like in nature than their US counterparts. A priori, this leads to the expectation that, within Western Europe, convertible debt issuance cycles largely coincide with straight debt issuance cycles. Our findings nonetheless reveal that there is only a small overlap between Western European convertible debt and straight debt issuance volume cycles. This highlights the importance of including convertible debt market conditions in addition to straight debt and equity market conditions in the analysis of stockholder wealth effects of convertible debt announcements.

Our most important empirical results are as follows. Consistent with our main hypothesis, we find that stockholder reactions are significantly positively influenced by aggregate convertible debt issuance volumes. Importantly, this result holds while controlling for other aggregate financing costs measures, i.e., equity and straight debt issuance volumes and several widely-used macroeconomic variables. Also in line with our

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[2] For comparison: 52 US industrial firms issued a total of $10.48 billion in convertible debt in 1990, and 88 US industrial firms issued a total of $37.00 billion in convertible debt in 2002 (source: Thomson ONE Banker).

[3] Specifically, de Roon and Veld (1998) examine the stock price impact of Dutch convertible debt announcements, Abhyankar and Dunning (1999) and Wolfe et al. (1999) investigate the announcement effects of UK convertibles, Burlacu (2000) studies stockholder reactions to French convertible debt announcements, and Ammann et al. (2006) examine stockholder wealth effects of German and Swiss convertibles.

expectations, we find that issuer- and issue-specific financing costs proxies have a weaker influence on convertible debt announcement returns during hot convertible debt windows than during non-hot windows.

On the whole, the above results support our premise that hot convertible debt markets represent windows of opportunity during which firms can obtain convertible debt financing with less negative announcement effects.

We also show that hot convertible windows are mainly used by companies with high costs of attracting external financing. Had these firms issued during a non-hot convertible debt market instead, their abnormal stock return at the convertible debt announcement would have been 274 basis points more negative, which corresponds to a market value loss of $95.11 million for the average hot market issuer. In the literature, there exists some mixed empirical evidence on equity market timing behavior by convertible debt issuers. Alexander et al. (1979) find no evidence supporting such behavior, while Mann et al. (1999) report that convertible debt issuers do try to time their offering during bullish equity markets. Our study extends these previous papers by showing that certain types of convertible debt issuers (i.e., issuers with high external financing costs) also try to time the convertible debt market, and that the dollar values of doing so are potentially very high.

The remainder of this paper is structured as follows. In the next section, we review the literature and develop the hypotheses. Section 3 describes the sample construction procedure. Section 4 presents the variables used in the regression analyses. Section 5 documents the empirical results, and Section 6 concludes the paper.

2. Development of hypotheses

Several researchers argue that financing costs vary not only cross-sectionally but also over time, due to temporal fluctuations in factors such as the availability of profitable investment opportunities or the level of uncertainty about firm value and firm risk (see, for example, Choe et al., 1993; Bayless and Chaplinsky, 1996; Korajczyk and Levy, 2003). If this is the case, then periods with low financing costs represent windows of opportunity during which otherwise identical firms can obtain external financing at more favorable terms.

Choe et al. (1993) and Bayless and Chaplinsky (1996) obtain supporting evidence for the existence of such windows of opportunity by studying stockholder reactions to seasoned equity offering announcements. Choe et al. (1993) show that abnormal stock

returns at SEO announcements are significantly less negative during business expansions. They attribute this finding to business expansions representing periods with more profitable investment opportunities and/or less uncertainty about assets in place, and thus a lower level of equity-related adverse selection costs. Bayless and Chaplinsky (1996), however, argue that relying on individual macroeconomic variables to identify windows of opportunity for equity issuance might omit potentially important information relevant to the issue. They claim that the aggregate equity issuance volume is likely to be a more representative summary measure for the economy-wide financing costs faced by equity issuers, since equity issuers cluster their offerings when these specific financing costs are low. In line with this conjecture, Bayless and Chaplinsky (1996) find that stockholder reactions to SEO announcements are significantly less negative during periods with a high equity offering volume (i.e., hot equity markets), even when controlling for several widely-used macroeconomic financing costs proxies.

Lewis et al. (2003) draw upon the rationale of Bayless and Chaplinsky (1996) by arguing that, since convertibles encompass an equity component, stockholder reactions to convertible debt announcements should also be less negative during hot equity markets. They obtain empirical evidence consistent with this hypothesis. Following a similar reasoning, we expect stockholder reactions to be more favorable for convertibles announced during hot straight debt windows. The underlying intuition is that, if straight debt-related financing costs fluctuate over time (e.g., due to temporal variations in the level of uncertainty about firm risk), then straight debt offerings are likely to cluster during periods when these costs are low. The straight debt offering volume thus acts as an inverse proxy for the economy-wide level of straight debt-related financing costs, which implies that it should have a positive influence on convertible debt announcement returns (due to the straight debt component embedded in convertibles).

We hypothesize, however, that the aggregate convertible debt issuance volume may be a more representative (inverse) measure for the overall financing costs faced by convertible debt issuers than either equity or straight debt issuance volumes. The reasoning behind this hypothesis is that, as stated by Ammann et al. (2005), convertibles are not simple combinations of straight debt and equity. Instead, these instruments represent a unique security class for which not only equity- and debt-related costs, but also the interactions between these costs matter. As a consequence, equity and straight debt volumes are unlikely to fully capture the relevant financing costs faced by convertible debt issuing firms. The same limitation holds for macroeconomic variables proxying aggregate

financing costs. We contend that convertible debt volume fluctuations are best suited to measure temporal variations in economy-wide convertible debt-related financing costs, since convertible debt issuers are likely to time their offering during periods when these specific financing costs are lowest. Consequently, stockholders should put more weight on convertible debt volumes than on other aggregate financing costs proxies in their assessment of the financing costs associated with a convertible offering.

Based on the above discussion, we can formulate the following predictions:

H1a: Stockholder reactions to convertible debt announcements are positively influenced by aggregate convertible debt issuance volumes.

H1b: The impact of convertible debt volumes on convertible debt announcement returns is stronger than the impact of equity and straight debt volumes and of macroeconomic variables.

In addition to the main (positive) predicted effect of convertible debt issuance volumes, we also predict that the influence of issuer- and issue-specific information on convertible debt announcement returns depends on convertible debt market conditions. Bayless and Chaplinsky (1996) state that, if hot equity markets represent periods with a smaller economy-wide level of equity-related financing costs, then stockholders should react less negatively to firm-specific equity-related costs measures during these windows. They obtain empirical evidence that supports this hypothesis. By the same logic, we argue that, if hot convertible markets effectively represent periods with a smaller aggregate level of convertible debt-related financing costs, then stockholders should be less worried about issuer- and issue-specific financing costs during these windows. We thus obtain the following prediction:

H2: During hot convertible debt windows, issuer- and issue-specific measures for external financing costs have a weaker impact on stockholder reactions to convertible debt announcements than during non-hot convertible debt windows.

3. Sample construction

The sample of convertible debt issues used for testing the above hypotheses was constructed as follows. First, we collected a list of all convertible debt offerings made by Western European industrial companies during the period January 1990 - December 2002 from Bloomberg Thomson Financial. We excluded issues offered by financial companies and utilities from our search, since the capital structure policy of such firms is often driven by regulatory aspects. We thus obtained a raw dataset of 303 convertible debt offerings. Observations that met all of the following criteria were retained for the final sample: (i) the offering is convertible into the issuing firm's stock (exclude exchangeables), (ii) company accounts and stock price data for the fiscal year prior to the announcement date are available on Datastream, (iii) security design data are available on Bloomberg, and (iv) no other confounding corporate event announcements (identified from Ebscohost, company websites and the Bloomberg Corporate Actions Calendar) were made on the offering announcement date. After applying the above filters, we obtained a final sample of 188 convertibles offered by 154 firms.

Panel (a) of Table 1 presents the number of convertible debt offerings per year. The table indicates that the number of offerings varies substantially over time. We also see that there is considerable growth in the European convertible debt issuance volume over the sample period: more than 50% of the issues occur during the last four sample years.

Panel (b) of Table 1 reports the number of convertible debt issues per country. Almost 40% of the issues are made by French firms. Prior studies (Ammann et al., 2003; Bancel and Mittoo, 2004) also document the domination of France in the European convertible market. Dutordoir and Van de Gucht (2006) find no evidence that this French domination is driven by particular firm-specific, macroeconomic or business law characteristics associated with French convertible issues. Noddings et al. (2001) cite increased M&A activity as main reason for the large appetite for convertibles in the French market. In the results section, we report robustness checks that indicate our results are not influenced by the dominance of the French issues.

<< Insert Table 1 about here>>

4. Measurement

4.1. Identification of hot convertible debt windows

Testing hypotheses H1a and H1b requires a measure for the aggregate convertible debt issuance volume. In the spirit of Bayless and Chaplinsky (1996), we calculate the aggregate convertible debt issuance volume as a lagged three-month moving average of the number of convertible debt issues made by Western European industrial firms.[4] To control for the general increasing trend in the convertible debt issuance volume over our research window, we subsequently scale the convertible debt issuance volume for each issue month by the sum of the issuance proceeds registered over the preceding 12 months.[5] The issuance proceeds are expressed in real terms by means of the European monthly Consumer Price Index (CPI) obtained from the OECD.

To test our prediction on the relation between convertible debt market conditions and the influence of issuer- and issue-specific variables (i.e., hypothesis H2), we need to identify the hot convertible debt windows over the research period. Bayless and Chaplinsky (1996) define hot equity markets as at least three contiguous months where the aggregate equity issuance volume exceeds the upper quartile of a three-month moving average of the aggregate equity issuance volume calculated over the research window. Using the same criterion for the convertible debt market, we identify four hot convertible debt windows over the period 1990-2002: October 1993-February 1994, March 1998-June 1998, April 1999-June 2000, and September 2001-March 2002. In total, 74 out of the 188 sample convertible debt issues are made during these intervals. Thus, whereas the hot convertible debt periods make up only 19.87% of the sample period (i.e., 31 out of 156 months), they account for 39.36% of the convertible debt issues in our sample.

Based on the documented debt-like nature of European convertible debt offerings (Dutordoir and Van de Gucht, 2004), we might expect a large overlap between hot convertible debt and hot straight debt windows. Nevertheless, a contingency table analysis reveals that only 60% of the hot convertible debt months are also hot straight debt months

[4] The moving average corresponding with a convertible issued in month t is defined as the average number of convertibles issued in months t-3 through t-1. The convertible offering volume calculations are based on the raw convertible debt offering list downloaded from Bloomberg rather than on the cleaned sample.

[5] Time series of monthly Western European security offering proceeds (expressed in million dollars) are obtained from Thomson ONE Banker.

(χ^2-statistic equals 24.72). The overlap between hot convertible debt and hot equity months is even smaller, i.e., 36.67% (χ^2-statistic equals 27.38).[6] These low overlaps suggests that it is worthwhile to include convertible debt market conditions next to equity and straight debt market conditions in an analysis of stockholder wealth effects of convertible debt announcements.

4.2. Measurement of abnormal stock returns around convertible debt announcements

To compute abnormal stock returns around convertible debt announcements, we apply standard event study methodology as described by Dodd and Warner (1983). As proxies for the market index, we use the respective value-weighted Datastream equity market indices for the individual European countries. In accordance with Dann and Mikkelson (1984) and Lewis et al. (1999, 2003), we estimate the market model regressions over the combined pre- and post-event estimation windows ((–200,–61), (61,200)) relative to the announcement date 0. The statistical significance of the abnormal return estimates is assessed by means of a Patell (1976) Z-test. Since daily abnormal stock returns are highly non-normal in nature (Campbell et al., 1997), we cross-check the conclusions obtained through this parametric test by means of a non-parametric Wilcoxon signed-rank test.

Table 2 presents abnormal stock returns calculated over several windows surrounding the announcement date. For the full convertible debt sample, the average (median) day-0 abnormal stock return is –1.59% (–1.54%), with 76.06% of the firms experiencing negative abnormal returns. The abnormal return is statistically significant both according to the Z-test and the Wilcoxon signed-rank test. Abnormal returns measured over windows (–1,0) and (0,1) are also significantly negative. Hence, similar to most country-specific studies on Western European convertibles (Abhyankar and Dunning, 1999; Wolfe et al., 1999; Burlacu, 2000; Ammann et al., 2006), we find that these offerings induce a significantly negative stockholder wealth effect.[7]

Unreported analyses of abnormal stock returns by sample country reveal that these returns are negative throughout all countries, except for Austria, Belgium and Finland,

[6] The lists of straight debt and equity offerings made by Western European industrial firms are obtained from Bloomberg. The calculation of the scaled straight debt and equity volumes and the identification of hot straight debt and equity windows is done in an analogous way as outlined for convertible debt issues.

[7] The only exception is the study by de Roon and Veld (1998), who find an insignificant stockholder wealth effect for Dutch convertible offerings.

which together account for only eight observations.[8] Average day-0 announcement effects registered for French convertibles (–1.80%) are not significantly different from those for non-French convertibles (–1.52%) (t-statistic for the difference in means equals –0.52). Thus, our event study results are not biased by the large presence of French convertibles in the Western European convertible debt universe.

<< Insert Table 2 about here >>

Columns (2) and (3) report abnormal stock returns separately for convertibles issued during hot and non-hot convertible debt markets. The results indicate that hot market issues induce a significantly negative average (median) day-0 abnormal return of –2.05% (–1.68%), while non-hot market issues induce a significantly negative average (median) day-0 abnormal return of –1.29% (–1.46%). The difference in abnormal returns between the two subsamples is not significant. For windows (–1,0) and (0,1), results are analogous. On a univariate basis, we thus obtain no evidence for our hypothesis that convertible debt announcement returns are less negative during hot convertible debt windows (i.e., hypothesis H1a). Section 5.2. investigates the relation between the abnormal returns and convertible market conditions in a multivariate context.

4.3. Explanatory variables

4.3.1. Economy-wide financing costs measures

The main purpose of this paper is to examine whether periods with a high convertible debt issuance volume represent windows of opportunity during which convertible debt announcement effects are systematically less negative. Thus, our key explanatory variable in the analysis of convertible debt announcement returns is the convertible debt volume, calculated as outlined in Section 4.1. To test hypothesis H1b, we incorporate several other widely-used proxies for fluctuations in economy-wide financing costs in the analysis. Due to the hybrid nature of convertible debt, we expect announcement returns to be more positive in periods with low aggregate equity- and debt-related financing costs. As inverse proxies for the economy-wide level of equity-related financing costs, we include the aggregate equity issuance volume (calculated as outlined in Section 4.1.) and the equity

[8] Detailed results of all robustness checks described throughout the paper are available upon request.

market return. Consistent with Ammann et al. (2006), we define the equity market return as the continuously-compounded return on the Datastream European equity market index measured over trading days –200 to –20 relative to the announcement date.[9] As proxies for the economy-wide level of debt-related costs, we include the straight debt issuance volume (calculated as outlined in Section 4.1.) and the five-year German Treasury Bond (TB) yield (retrieved from Datastream). The straight debt issuance volume acts as an inverse debt-related cost proxy, whereas the TB yield acts as a direct debt-related cost proxy. We also include the 6-month leading indicator for the European economy (retrieved from Datastream) as an inverse proxy for external financing costs in general (i.e., both debt- and equity-related financing costs). In line with Choe et al. (1993), we express the TB yield as an average value calculated over the quarter preceding the issue month, and the leading indicator as a logarithmic growth rate calculated over the quarter preceding the issue month.

4.3.2. Issuer-specific characteristics

As noted by Bayless and Chaplinsky (1996), windows of opportunity exist only to the extent that the observed variations in abnormal stock returns are independent of specific firm and security design characteristics. Not appropriately controlling for these features might lead to erroneous conclusions on the existence of windows of opportunity. Since convertibles encompass an equity component, we expect stockholder reactions to convertible debt announcements to be more negative for firms with high equity-related financing costs.[10] Similarly, due to the debt component embedded in convertible debt, we also expect convertible debt announcement returns to be more negative for firms with high costs of attracting new debt(-related) capital.

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[9] Results remain unaltered if we measure the equity market return over other intervals, e.g., the windows (–110, –20), (–290, –20), and (–380, –20). Our findings are also robust to the use of a French instead of a European market index.

[10] This prediction might seem at odds with the convertible debt rationale of Stein (1992), who states that convertibles can be used as tools to mitigate equity-related adverse selection costs. However, even though convertibles entail smaller equity-related financing costs than equity offerings, their equity component still induces an incremental increase in the level of equity-related costs of the issuing firm. Thus, *within* a convertible debt sample, we expect stockholder reactions to be more negative for issuers with high equity-related financing costs. An analogous reasoning applies for the impact of debt-related financing costs on convertible debt announcement returns.

All issuer characteristics included in the regression analyses are measured at fiscal year-end preceding the convertible debt announcement date, unless otherwise indicated. In line with Lewis et al. (1999, 2003), we use the amount of slack capital (calculated as cash plus marketable securities divided by total assets) and the pre-announcement stock runup (measured as the continuously-compounded non-market-adjusted daily stock return over trading days –75 to –1 relative to the announcement date) as proxies for the level of equity-related financing costs faced by the convertible debt issuers. When a firm with sufficient slack capital issues risky securities, stockholders are more likely to infer that this firm is overvalued, since undervalued firms would rather resort to internal slack financing. Therefore, firms with a large amount of slack capital are expected to incur higher equity-related adverse selection costs (Myers and Majluf, 1984). Stockholders may also interpret a large pre-announcement stock runup as a signal of opportunistic timing behavior, which again results in higher equity-related adverse selection costs (Lucas and McDonald, 1990). We thus expect both the slack capital and the pre-announcement stock runup to have a negative impact on stockholder reactions to convertible debt announcements.

To capture the level of debt-related financing costs of the convertible debt issuers, we include the leverage ratio (calculated as the ratio of total debt to total assets), the daily stock return volatility (measured over trading days –240 to –40 prior to the announcement date) and the ratio of taxes paid to total assets. In the finance literature, it is generally assumed that firms with a higher leverage ratio and stock return volatility and a lower tax ratio face higher costs of attracting new debt financing (see, e.g., Lewis et al., 1999, 2003). Thus, we predict stockholder reactions to convertible debt announcements to be negatively influenced by the leverage ratio and the stock return volatility, and positively influenced by the tax ratio.

Next to these specific equity- and debt-related costs measures, we also include three control variables that act as proxies for both equity- and debt-related financing costs. First, we control for the availability of profitable growth opportunities by including the market-to-book ratio, calculated as the ratio of (book value of total assets plus market value of common equity (measured one week prior to the announcement date) minus book value of common equity) to the book value of total assets. As argued by de Jong and Veld (2001), the availability of profitable growth opportunities reduces the potential for managerial opportunism (e.g., investing in negative NPV projects). Hence, we expect the market-to-book ratio to have a positive impact on stockholder reactions to convertible debt announcements. We also control for firm size, measured as the natural logarithm of the

book value of total assets, converted in constant December 2002 US dollars by means of the European monthly CPI. Our last issuer-specific control variable is the ratio of fixed assets to total assets. Firms with a large size and/or a high proportion of fixed assets tend to have lower levels of asymmetric information relating to their value and risk, resulting in smaller equity- and debt-related financing costs (MacKie-Mason, 1990). We thus expect both firm size and the fixed assets ratio to have a positive influence on convertible debt announcement returns.

Descriptive statistics for the above issuer-specific variables (not reported in detail for parsimony) are largely similar to the corresponding values recorded by US-based papers (e.g., Nanda and Yun, 1996; Lewis et al., 1999, 2003). Consistent with these studies, we find that convertible debt issuers tend to have volatile stock returns (average (median) daily stock return volatility of 0.027 (0.025)), a substantial pre-announcement stock runup (average (median) runup of 0.068 (0.072)), and many profitable growth opportunities (average (median) market-to-book ratio of 2.742 (1.403)). Nevertheless, there is also an important difference between European and US convertible debt issuer clienteles. More particularly, Western European convertible debt issuers are on average about five times larger than their US counterparts: we record an average (median) total assets size of $5,185 ($1,279) million, whereas US-based studies generally record an average (median) total assets size in the order of $1,500 ($300) million (see, for example, descriptive statistics reported by Lewis et al., 2003). This divergence in size might reflect that, in Europe, only relatively large firms tend to resort to public capital markets for their funding (Pagano et al., 1998).

4.3.3. Issue-specific characteristics

In line with Lewis et al. (1999, 2003), we control for the relative size of the convertible debt offering, calculated as the issue proceeds divided by the market value of equity measured one week prior to the offering announcement date. Ceteris paribus, we expect larger offerings to induce higher external financing costs, and hence more negative announcement returns.

We also include a proxy for the size of the equity component of the convertible debt offering in the regression analyses, being the convertible debt delta (equally used by Burlacu, 2000; Ammann et al., 2006; Loncarski et al., 2006). While not an exact measure of the equity component embedded in convertibles, the delta is likely to provide a more complete indication of the level of equity-likeness of convertible issues than are individual

proxies such as the conversion premium or the maturity of the offering (Burlacu, 2000). A high delta means that the convertible bond is very sensitive to its underlying stock value and, therefore, is similar to equity. In contrast, when the delta is small, the bond component of the convertible prevails. Under the restrictive assumption that the convertibles may be considered as the sum of a standard bond and a European warrant entitling the owner to purchase a fraction of the equity upon an exercise payment equal to the principal of the bond, the delta of convertibles equals the delta of the embedded warrant (Burlacu, 2000). The delta can then be represented by the following formula:

$$\Delta = e^{-\delta T} N(d_1) = e^{-\delta T} N\left\{ \frac{\ln\left(\frac{S}{X}\right) + \left(r - \delta + \frac{\sigma^2}{2}\right) T}{\sigma \sqrt{T}} \right\} \quad (1),$$

where δ is the continuously-compounded dividend yield measured at fiscal year-end preceding the announcement date (retrieved from Datastream); T is the initial convertible debt maturity (expressed in years); $N(.)$ is the cumulative probability under a standard normal distribution function; S is the price of the underlying stock measured one week prior to the announcement date; X is the conversion price, r is the continuously-compounded yield on a five-year German TB (measured on the announcement date, retrieved from Datastream), and σ is the stock return volatility per annum (measured over the year preceding the announcement date).

The average (median) delta value of our Western European sample issues is 0.632 (0.635), whereas Dutordoir and Van de Gucht (2004) obtain an average (median) delta value of 0.82 (0.84) for a sample of US convertibles selected according to similar criteria. Hence, we find evidence that Western European convertibles are structured to be more debt-like than their US counterparts. On the basis of the signaling model of Myers and Majluf (1984), we expect the delta to have a negative influence on convertible debt announcement returns (see also Davidson et al., 1995; Magennis et al., 1998; Burlacu, 2000).

Since 36.10% of our sample issues are placed on the Eurobond market, we also include a Eurobond dummy variable equal to unity for Eurobond issues and equal to zero otherwise. The covenants on Eurobond offerings are generally more difficult to enforce than those on domestic offerings (Kim and Stulz, 1992). Hence, we expect Eurobond

convertibles to induce larger financing costs, and therefore more negative stockholder reactions.

As the above issue-specific characteristics are choice variables of firm management, we might induce an endogeneity bias by combining these variables with issuer characteristics in a single regression equation. Therefore, in line with Datta et al. (1999), we first regress each of the three issue-specific variables on the eight issuer-specific variables. We then use the residuals of these regression analyses instead of the original issue-specific features in the different regression analyses. Because these residuals are orthogonal to the issuer-specific variables, their regression coefficients reflect the incremental impact of the issue-specific characteristics over the impact of issuer-specific determinants on convertible debt announcement returns.

5. Empirical results

5.1. Differences in financing costs between hot and non-hot convertible markets

In a first step of our empirical analysis, we assess the differences in financing costs between hot and non-hot convertible debt markets by conducting a probit analysis with the dependent variable equal to unity for hot market convertibles and equal to zero for non-hot market convertibles. The results of this analysis are reported in Table 3.

<< Insert Table 3 about here >>

The probit regression indicates that hot convertible markets are characterized by significantly higher equity issuance volumes and leading indicators, and significantly smaller straight debt issuance volumes and TB yields than non-hot markets. Apart from the negative coefficient on the straight debt volume, these results are consistent with our premise that hot convertible debt windows represent periods with smaller economy-wide financing costs.

With respect to the issuer- and issue-specific financing costs proxies, we find that firms issuing during hot markets have a significantly higher pre-announcement stock runup, leverage ratio and stock return volatility and a significantly smaller fixed assets ratio than firms issuing during non-hot markets. We also find that hot market issues are significantly smaller in size than non-hot issues, and that the proportion of Eurobond issues is

significantly higher among hot market offerings. Apart from the negative coefficient on the relative issue size, these results suggest that hot market issuers suffer from higher firm- and issue-specific financing costs than non-hot market issuers.

On the whole, we thus find that hot convertible markets are characterized by lower levels of economy-wide financing costs, but higher levels of idiosyncratic financing costs than non-hot convertible markets.

5.2. Full-sample abnormal return regressions

Table 4 reports the results of full-sample regression analyses with the day-0 abnormal stock return as dependent variable. The regressions are all estimated by means of the weighted-least-squares technique to avoid a heteroscedasticity bias.

<< Insert Table 4 about here >>

Column (1) analyzes the impact of the convertible debt volume on the stockholder reactions while controlling for the issuer- and issue-specific variables discussed in Section 4. We see that the convertible debt volume has a significant (at less than 5%), positive impact on convertible debt announcement returns. Thus, once controlled for issuer- and issue-specific determinants, we do find evidence for hypothesis H1a. The insignificance of the univariate test results on the differences in abnormal stock returns between hot and non-hot convertible markets (reported in Table 2) likely results from the fact that the negative impact of the higher idiosyncratic financing costs associated with hot market offerings washes out the favorable impact of the lower aggregate financing costs during hot markets.

Column (2) reestimates the regression reported in Column (1) with other economy-wide financing costs proxies included. The convertible debt volume parameter remains significant at less than 5%. The leading indicator is also significant at less than 10%, and exhibits the predicted positive sign. None of the other aggregate measures is significant. Our finding of an insignificant impact of the equity market return contrasts with Ammann et al. (2006), who detect a significant positive influence of equity market returns on convertible debt announcement effects. The divergence between their results and ours can be attributed to the fact that they include no other economy-wide financing costs proxy than the equity market return in their regression. When we replicate the abnormal return

regression specification used in Ammann et al. (2006), we also obtain a significant positive regression coefficient for the equity market return.

On the whole, our evidence presented in Table 4 is consistent with hypothesis H1b stating that convertible debt volumes are a more accurate summary measure for the relevant financing costs faced by convertible debt issuers than equity volumes, straight debt volumes or macroeconomic determinants.

Our results with regards to the issuer- and issue-specific control variables are as follows. In line with our expectations, we find that the tax ratio has a significantly positive impact on the announcement returns.[11] The fixed assets ratio also has the expected significantly positive regression coefficient. Lastly, as predicted, the relative issue size and the Eurobond dummy variable both have a significantly negative influence on the stockholder reactions. We can thus conclude that, next to the significant impact of economy-wide financing costs measures, convertible debt announcement returns are also significantly influenced by issuer- and issue-specific financing costs proxies. We will now examine whether the impact of these idiosyncratic financing costs tends to be less strong during hot convertible debt windows, as predicted by hypothesis H2.

5.3. Split-sample abnormal return regressions for hot and non-hot convertible markets

To test hypothesis H2, we conduct a split-sample regression analysis of the impact of issuer- and issue-specific financing costs on the stockholder wealth effects of convertibles issued during hot and non-hot convertible markets. If we were to simply estimate regressions on a sample of firms partitioned by the convertible debt market condition in which they issue, the resulting estimates would be biased because of the documented clustering of firms with high idiosyncratic financing costs into hot convertible debt market

[11] To assess whether the significantly positive regression parameter of the tax ratio reflects country-specific differences in tax rates rather than firm-specific differences in potential tax shields, we reestimated the regression analysis reported in Table 4 with the corporate tax rate prevailing in the country of domicile of the issuing company as an additional explanatory variable. The corporate tax rate is obtained from the World Development Indicators database and is measured as the highest marginal corporate tax rate as of December 2002. The regression coefficient of the country-specific corporate tax rate turns out to be insignificant, whereas the regression parameter of the tax to total assets ratio remains significantly positive (at less than 5%). This observation suggests that our finding of a significantly positive influence of the tax ratio is driven by firm-specific characteristics rather than by country-specific differences in tax rates.

conditions. This self-selection induces non-zero correlation between the unobservable factors (or error terms) influencing the choice for a particular market condition and the error terms influencing the abnormal stock returns. As shown by Heckman (1979), we can eliminate the bias due to self-selection by including the error term of the selection equation (i.e., a probit analysis of the choice between hot and non-hot convertible debt markets as reported in Table 3) in the split-sample abnormal return regressions. Since we cannot observe this error term, we need to take its conditional expectation, which is the inverse Mills ratio (IMR). The IMR is calculated as $\varphi(\hat{I})/\psi(\hat{I})$ for hot market offerings and as $-\varphi(\hat{I})/(1-\psi(\hat{I}))$ for non-hot market offerings, with φ the standard normal probability density function, ψ the cumulative standard normal distribution function, and $\hat{I}$ the predicted values estimated from the first-step probit analysis reported in Table 3. Table 5 presents the split-sample regression results for hot market issues (Column (1)) and for non-hot market issues (Column (2)).[12] Reported t-statistics are calculated using standard errors corrected for the inclusion of estimated inverse Mills ratios along the lines suggested by Heckman (1979).

<< Insert Table 5 about here >>

The adjusted R^2 of the hot market regression (8.87%) is much smaller than the adjusted R^2 of the non-hot market regression (27.22%). A Chow test rejects the hypothesis that the parameter estimates of the hot and non-hot market regressions are jointly equal at the 5% level (F-statistic equals 2.21). Comparing the individual regression coefficients reveals that, in the non-hot market regression, the stock return volatility, the tax ratio, the total assets size, the fixed assets ratio, the delta and the Eurobond dummy variable are all significant with the expected signs. In the hot market regression, by contrast, only the stock return volatility and the Eurobond dummy variable are significant with the expected signs. We can thus conclude that stockholders differentiate less on issuer- and issue-specific information during hot market conditions, which is consistent with hypothesis H2.

The coefficients on the IMR provide an indication of the presence and significance of any self-selection bias. More particularly, they give an estimate of the correlation between

[12] Due to the limited number of observations, we do not include economy-wide financing costs measures in the split-sample regressions. When included, these variables are always insignificant both in the hot and non-hot market regressions.

the error terms in the probit model and the error terms in the abnormal return regressions. Only if the coefficients on both IMR coefficients are insignificant can we conclude that there is no self-selection. The IMR in the hot market regression is insignificant, but the IMR in the non-hot market regression is significant at less than 1%. As the IMR in the non-hot market regression is always negative by construction, its negative coefficient indicates that unobservable factors that make firms choose not to issue during a hot convertible window (negative error term in the probit model) tend to have a positive influence on stockholder wealth effects (positive error term in the abnormal return regression). This result is consistent with our earlier finding that non-hot market issuers tend to have smaller idiosyncratic financing costs than hot market issuers.

On the whole, the regression results presented in Tables 4 and 5 are in line with our conjecture that hot convertible debt windows represent periods with smaller financing costs for convertible debt issuers. Nevertheless, following the reasoning in Bayless and Chaplinsky (1996), we acknowledge that another interpretation of our results is stockholder herding behavior during hot issue windows. More particularly, during hot convertible markets, stockholders may suspend a careful evaluation of each separate convertible debt offering (based on its idiosyncratic issuer and security design characteristics) in favor of a collective, less negative assessment of all convertible debt offering announcements. Unfortunately, the regression results reported in Tables 4 and 5 do not allow us to distinguish between these two non-mutually exclusive interpretations.

To assess the economic significance of systematically more positive convertible debt announcement effects during hot convertible windows, we perform the following counterfactual analysis proposed by Dunbar (1995). Based on the estimated regression models in Table 5, we calculate forecasts of expected announcement period abnormal returns had hot market issuers issued during a non-hot market instead. We determine these forecasts by multiplying the parameter estimates from Column (2) of Table 5 with the corresponding value of the independent variable for each hot market issuer.[13] In line with Dunbar (1995), we exclude the coefficient on the IMR from the calculations because its role is simply to adjust for non-zero expectations of regression errors.

The predicted values indicate that, if hot market issuers had made their offer during non-hot markets, their average (median) day-0 announcement return would have been

[13] Due to the very limited explanatory power of the hot market regression, we do not conduct an analogous counterfactual analysis for the non-hot market issuers.

–4.79 (–4.31)% instead of –2.05 (–1.68)%. The difference between predicted and actual returns is not only significant in statistical terms (Wilcoxon test statistic equals –4.78) but also in economic terms. Specifically, this difference indicates that the typical hot market issuer would have encountered an (on average) 274 basis points more negative announcement effect had it issued during a non-hot market, which translates into an additional equity value loss of $95.11 million for the average hot market issuer.[14] One can judge the economic importance of this equity value loss by comparing it to the direct costs of issuance. The average direct costs associated with a Western European convertible debt offering amount to 2.13% of the offering's gross proceeds.[15] A typical hot convertible debt issue with average nominal dollar proceeds of $365.52 million therefore entails direct issuance costs in the order of $7.79 million. Hence, for hot market issuers, the potential gains of timing their issue during a hot window are approximately twelve times larger than the direct costs of convertible debt issuance.

6. Conclusions

This paper shows that stockholder reactions to Western European convertible debt announcements are significantly less negative during hot convertible debt windows. In addition to the main (positive) effect of convertible debt issuance volumes, we uncover a relation between the convertible debt market condition and the way in which stockholders respond to idiosyncratic information. Specifically, during hot convertible debt markets, issuer- and issue-specific financing costs have a weaker influence on stockholder reactions than during non-hot convertible debt markets.

On the whole, the above results support the existence of windows of opportunity during which otherwise identical firms can obtain convertible debt financing with a smaller adverse stock price impact. We also show that these windows are mainly used by firms with high costs of attracting external financing. For these companies, the absolute dollar value benefits of timing their offering during a hot convertible debt window are about twelve times the size of the direct underwriting costs associated with a convertible debt financing.

[14] This value is calculated as (4.79% – 2.05%) * average market value of equity of hot market issuers (measured one week prior to the offering announcement date), which equals $3,471.32 million.

[15] This percentage includes lead management fees, underwriting fees, selling concessions and reallowance fees for selling in the secondary market (Thomson ONE Banker).

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Table 1
Sample description
(a) Convertible debt offerings sorted by issue year

Issue year	Number of issues	Cumulative percentage
1990	3	1.60%
1991	5	4.26%
1992	5	6.91%
1993	9	11.70%
1994	9	16.49%
1995	4	18.62%
1996	6	21.81%
1997	22	33.51%
1998	20	44.15%
1999	26	57.98%
2000	34	76.06%
2001	26	89.89%
2002	19	100.00%
N	188	100.00%

(b) Convertible debt offerings sorted by country of domicile of issuing firm

Country	Number of issues	Percentage
Austria	2	1.06%
Belgium	3	1.60%
Denmark	3	1.60%
Finland	3	1.60%
France	74	39.36%
Germany	11	5.85%
Italy	3	1.60%
the Netherlands	22	11.70%
Norway	8	4.26%
Spain	3	1.60%
Sweden	8	4.26%
Switzerland	17	9.04%
United Kingdom	31	16.49%
N	188	100.00%

The convertible debt sample is retrieved from Bloomberg and consists of 188 convertibles issued by 154 Western European industrial companies between 1990 and 2002. Panel (a) presents the number and cumulative percentage of convertible debt offerings per issue year. Panel (b) reports the number and percentage of convertible debt offerings per sample country.

Table 2
Daily abnormal stock returns (AR) around Western European convertible debt announcements

Interval	Full sample (N= 188) (1)		Hot market issues (N = 74) (2)		Non-hot market issues (N = 114) (3)		Difference between hot market and non-hot market issues
	Mean (median) AR	Z-statistic (% negative)	Mean (median) AR	Z-statistic (% negative)	Mean (median) AR	Z-statistic (% negative)	t-statistic (Wilcoxon signed-rank statistic)
(–1,0)	–1.35% (–1.42%)	–4.90*** (66.49%)***	–1.79% (–1.77%)	–4.00*** (66.22%)***	–1.07% (–1.20%)	–3.07*** (66.67%)***	–1.07 (–1.17)
0	–1.59% (–1.54%)	–8.19*** (76.06%)***	–2.05% (–1.68%)	–6.41*** (77.03%)***	–1.29% (–1.46%)	–5.35*** (75.44%)***	–1.40 (–1.45)
(0,1)	–1.54% (–1.59%)	–5.61*** (65.43%)***	–1.87% (–1.91%)	–3.71*** (66.22%)***	–1.33% (–1.24%)	–4.27*** (64.91%)***	–0.78 (–1.21)

This table reports estimates of abnormal stock returns around Western European convertible debt announcements. The convertible debt sample is retrieved from Bloomberg and consists of 188 convertibles issued by 154 Western European industrial companies between 1990 and 2002. Abnormal stock returns (AR) are calculated by means of standard event study methodology as described by Dodd and Warner (1983). As proxy for the market index, we use the Datastream equity market index for the issuing firm's country of domicile. Market model regressions are estimated over the windows (–200, –61) and (61,200) relative to the announcement dates. The Patell (1976) Z-statistic indicates the significance of the average abnormal returns. The significance of the percentage of negative abnormal returns is tested by means of the Wilcoxon signed-rank test. Hot market issues are convertible debt offerings made during hot convertible debt windows, with hot convertible windows identified according to the criterion developed by Bayless and Chaplinsky (1996). Non-hot market issues are all other offerings. *, ** and *** denote significance at the 0.10 level, 0.05 level and 0.01 level, respectively.

Table 3
Probit analysis of differences in financing costs between hot and non-hot convertible debt markets

Variables	Parameter estimates (χ^2-statistics)
Intercept	–15.909** (4.60)
Economy-wide financing costs	
Equity issuance volume (E^-)	2,092.978*** (17.54)
Equity market return (E^-)	1.407 (1.17)
Straight debt issuance volume (D^-)	–19,341.200*** (18.24)
TB yield (D)	–1.817*** (28.40)
Leading indicator (D^-, E^-)	23.765*** (9.75)
Issuer-specific financing costs	
Slack/TA (E)	–0.171 (0.02)
Stock runup (E)	1.056** (4.41)
Debt/TA (D)	1.546* (3.56)
Volatility (D)	28.535** (4.56)
Tax/TA (D^-)	3.873 (0.34)
M/B ratio (D^-, E^-)	–0.057 (0.74)
Ln(total assets) (D^-, E^-)	–0.013 (0.03)
Fixed assets/TA (D^-, E^-)	–1.798** (6.60)
Issue-specific financing costs	
Relative issue size (D,E)	–2.691** (4.12)
Delta (E)	0.305 (1.58)
Eurobond dummy variable (D,E)	2.893** (5.81)
Log likelihood	–73.607
N	188

This table presents the results of a probit analysis examining the differences in economy-wide, issuer-specific, and issue-specific financing costs between hot market and non-hot market convertible debt issues. The dependent variable is a dummy equal to unity for hot market issues, and equal to zero for non-hot market issues. Hot market issues are convertible debt offerings made during hot convertible debt windows, with hot convertible windows identified according to the criterion developed by Bayless and Chaplinsky (1996). Non-hot market issues are all other offerings. $D^{(-)}$ denotes an (inverse) debt-related financing costs proxy, $E^{(-)}$ denotes an (inverse) equity-related financing costs proxy. Equity (straight debt) issuance volumes are three-month moving averages of the aggregate number of equity (straight debt) offerings made by Western European industrial companies calculated over the quarter preceding the issue month, and scaled by aggregate Western European equity (straight debt) issuance proceeds over the 12 months preceding the issue month. Equity market return is the return on the Datastream European equity market index over the window (–200, –20) prior to the announcement date. TB yield is the yield on 5-year German Treasury Bonds, expressed as an average value over the quarter preceding the issue month. Leading indicator is the 6-month leading economic indicator for Western Europe, expressed as a logarithmic growth rate calculated over the quarter preceding the issue month. All issuer-specific variables are measured at fiscal year-end prior to the announcement date, unless otherwise indicated. Slack/TA equals the sum of cash and marketable securities divided by total assets. Stock runup is the raw stock return measured over the window (–75, –1) relative to the announcement date. Debt/TA is total debt divided by total assets. Volatility denotes the standard deviation of the daily stock returns measured over the window (–240, –40) relative to the announcement date. Tax/TA is taxes paid divided by total assets. M/B ratio is the market-to-book ratio, calculated as (total assets + market value of equity measured one week prior to the announcement date – book value of equity)/total assets. Total assets is the book value of total assets, expressed in constant 2002 US dollars using the monthly European CPI. Fixed assets/TA is fixed assets divided by total assets. Relative issue size is the offering size divided by the market value of equity measured one week prior to the offering announcement date. Delta is the sensitivity of the convertible bond value to its underlying common stock value (calculated according to equation (1)). Eurobond dummy is equal to unity for offerings placed on the Eurobond market, and equal to zero otherwise. *, ** and *** denote significance at the 0.10 level, 0.05 level and 0.01 level, respectively.

Table 4
Full-sample analysis of determinants of stockholder reactions to convertible debt announcements

Variables	Parameter estimates (t-statistics)	
	(1)	(2)
Intercept	–0.110** (–2.58)	–0.467** (–2.27)
Economy-wide financing costs		
Convertible debt issuance volume (C^-)	59.828** (2.16)	83.560** (2.25)
Equity issuance volume (E^-)	-	6.761 (0.79)
Equity market return (E^-)	-	–0.042 (–1.11)
Straight debt issuance volume (D^-)	-	39.948 (0.40)
TB yield (D)	-	–0.003 (–0.64)
Leading indicator (D^-, E^-)	-	0.351* (1.79)
Issuer-specific financing costs		
Slack/TA (E)	0.005 (0.20)	0.005 (0.18)
Stock runup (E)	–0.008 (–0.80)	–0.011 (–1.10)
Debt/TA (D)	0.004 (0.24)	0.002 (0.11)
Volatility (D)	–0.247 (–0.91)	–0.334 (–1.15)
Tax/TA (D^-)	0.364** (2.55)	0.338** (2.30)
M/B ratio (D^-, E^-)	0.002 (1.65)	0.002 (1.47)
Ln(total assets) (D^-, E^-)	0.003 (1.41)	0.003 (1.58)
Fixed assets/TA (D^-, E^-)	0.053*** (3.80)	0.052*** (3.67)
Issue-specific financing costs		
Relative issue size (D,E)	–0.034** (–2.05)	–0.027* (–1.76)
Delta (E)	–0.032 (–1.24)	–0.040 (–1.53)
Eurobond dummy variable (D,E)	–0.013** (–2.23)	–0.014** (–2.01)
R^2 adjusted	16.06%	15.62%
N	188	188

This table presents the results of regressions of abnormal stock returns at Western European convertible debt announcements on economy-wide, issuer-specific and issue-specific financing costs measures. Regressions are estimated using weighted least squares, with as weight for each observation the inverse of the standard deviation of the corresponding market model residual. The dependent variable is the abnormal stock return realized on the convertible debt announcement date, calculated according to standard event study methodology as described by Dodd and Warner (1983). $D^{(-)}$ denotes an (inverse) debt-related financing costs proxy, $E^{(-)}$ denotes an (inverse) equity-related financing costs proxy, and C^- denotes an inverse convertible debt-related financing costs proxy. Convertible debt volumes are three-month moving averages of the aggregate number of convertible debt offerings made by Western European industrial companies calculated over the quarter preceding the issue month, and scaled by aggregate Western European convertible debt issuance proceeds over the 12 months preceding the issue month. The other independent variables are defined as described below Table 3. *, ** and *** denote significance at the 0.10 level, 0.05 level and 0.01 level, respectively.

Table 5
Split-sample analysis of determinants of stockholder reactions to convertible debt announcements

Variables	Parameter estimates (t-statistics)	
	Hot market issues (1)	Non-hot market issues (2)
Intercept	–0.011 (–0.18)	–0.122** (–2.51)
Issuer-specific financing costs		
Slack/TA (E)	0.010 (0.28)	–0.022 (–0.64)
Stock runup (E)	–0.012 (–0.66)	–0.005 (–0.35)
Debt/TA (D)	–0.035 (–1.38)	0.032 (1.35)
Volatility (D)	–0.838* (–1.80)	–1.011*** (–2.85)
Tax/TA (D^-)	0.314 (1.53)	0.511*** (2.74)
M/B ratio (D^-, E^-)	0.003 (1.40)	0.001 (0.90)
Ln(total assets) (D^-, E^-)	0.000 (0.05)	0.004* (1.67)
Fixed assets/TA (D^-, E^-)	0.035 (1.63)	0.048*** (2.82)
Issue-specific financing costs		
Relative issue size (D,E)	–0.058 (–0.95)	–0.009 (–0.46)
Delta (E)	0.041 (0.89)	–0.051* (–1.87)
Eurobond dummy variable (D,E)	–0.014* (–1.65)	–0.024*** (–3.35)
Inverse Mills ratio	–0.006 (–0.75)	–0.035*** (–5.84)
R^2 adjusted	8.87%	27.22%
N	74	114

This table analyzes whether the impact of issuer- and issue-specific characteristics on convertible debt announcement returns is different between hot market and non-hot market issues. Hot market issues are convertible debt offerings made during hot convertible debt windows, with hot convertible windows identified according to the criterion developed by Bayless and Chaplinsky (1996). Non-hot market issues are all other offerings. Regressions are estimated using weighted least squares, with as weight for each observation the inverse of the standard deviation of the corresponding market model residual. The dependent variable is the abnormal stock return realized on the convertible debt announcement date, calculated by means of standard event study methodology as described by Dodd and Warner (1983). $D^{(-)}$ denotes an (inverse) debt-related financing costs proxy, $E^{(-)}$ denotes an (inverse) equity-related financing costs proxy. Inverse Mills ratios are calculated as $\varphi(\hat{I})/\psi(\hat{I})$ for hot market offerings and as $-\varphi(\hat{I})/(1-\psi(\hat{I}))$ for non-hot market offerings, with φ the standard normal probability density function, ψ the cumulative standard normal distribution function, and $\hat{I}$ the predicted value estimated from a probit model as presented in Table 3. All other independent variables are defined as described below Table 3. *, ** and *** denote significance at the 0.10 level, 0.05 level and 0.01 level, respectively.

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