Achleitner, Ann-Kristin; Braun, Reiner; Tappeiner, Florian

Working Paper

Structure and determinants of financial covenants in leveraged buyouts - evidence from an economy with strong creditor rights

CEFS working paper series, No. 2009-15

Provided in cooperation with:
Technische Universität München

Suggested citation: Achleitner, Ann-Kristin; Braun, Reiner; Tappeiner, Florian (2009) : Structure and determinants of financial covenants in leveraged buyouts - evidence from an economy with strong creditor rights, CEFS working paper series, No. 2009-15, http://hdl.handle.net/10419/48443

Structure and Determinants of Financial Covenants in Leveraged Buyouts*

First draft: December 2009

This draft: August 2010

Ann-Kristin Achleitner[1], Reiner Braun[1], Bastian Hinterramskogler[1], Florian Tappeiner[1]

1 *Center for Entrepreneurial and Financial Studies (CEFS), Technische Universität München*

Abstract

We use a proprietary dataset to explore (i) the financial covenant structure and (ii) the determinants of their restrictiveness in leveraged buyouts. With respect to (i) we find that the covenant structure is more standardized in sponsored than in non-sponsored loans: the former show less variation in the included types and combinations of covenants and include more financial covenants than the latter. With respect to (ii) we measure financial covenant restrictiveness precisely as the distance between threshold and financial forecast. We show that two competing mechanisms, reduced information asymmetry costs and increased financial risk, affect the restrictiveness in sponsored loans.

JEL: G21, G24, G32, G34

Keywords: Financial covenants, leveraged buyouts, financing structure, control rights

* We thank three banks for the access to their transaction and credit documentation. Additionally, we are very grateful to an anonymous referee, Tim Jenkinson and Jerry Cao for insightful comments. Part of this paper was written while Braun and Hinterramskogler were visiting scholars at the Saïd Business School, University of Oxford.

1. Introduction

Since the 1980s the private equity market has grown tremendously in terms of size and geographic reach. Strömberg (2008) estimates the total aggregated global value of firms acquired by private equity from 1970 to 2007 at $3.6 trillion, of which a substantial part ($1.6 trillion) was transacted in the period from 2005 to June 2007. After this second leveraged buyout (LBO) boom had burst with the financial crisis, financial covenants received increasing attention in academia and the media.[1]

Financial covenants are financial ratios which serve as an instrument for the allocation of control rights between lenders and borrowers (Aghion and Bolton, 1992; Hart, 1995). They reveal the state of the firm during the borrowing period. If the state of the firm is 'good', equity holders remain in control and might even reap private benefits. In contrast, if the state of the firm is 'bad', i.e. financial covenants are violated and the company is in 'technical default', control rights shift to lenders, who then have the right to call their loans. If the call is executed, the borrower might be forced into bankruptcy.

Although financial covenants are an important value driver for borrowers and lenders (see e.g. Zhang 2009), little is known about the setting of financial covenants, i.e. their structure and the determinants of their restrictiveness, in LBOs. This paper provides a detailed analysis of both issues. Why should we expect the covenant setting for private equity sponsored loans to be any different than the covenant setting for traditional, non-sponsored corporate loans? There are two competing arguments which we refer to as *reduced information asymmetry costs* and *increased financial risk.*

[1] For instance see the NY Times article 'Analysts will be watching loan covenants in 2009', by Natalie Harrison and Jane Baird, November 30 2008. This prediction has been supported by a recent PWC industry survey which highlighted that 75% of the private equity respondents had to deal with covenant breaches within their portfolio companies or were otherwise required to enter negotiations with financing banks in 2009. See http://www.pwc.de/fileserver/RepositoryItem/Pr_Equity_Trend_Report_2010.pdf?itemId=13602751

The *reduced information asymmetry costs* argument emanates from the repeated, highly frequent interactions between private equity investors and (i) specific banks and (ii) the lending market in general as compared to traditional corporate borrowers (Ivashina and Kovner, 2010). With respect to (i), banks are able to accumulate and reuse valuable information about private equity investors through repeated interactions. With each additional transaction, they will gain more sponsor-specific information leading to lower screening and/or monitoring costs in future transactions (e.g. James, 1987; Ivashina and Kovner, 2010). With respect to (ii), private equity investors mitigate informational asymmetry costs through their general reputation in lending markets. A good reputation is acquired over time through repeated borrowing and a track record of repayment. Borrowers benefit from their reputation in terms of better lending conditions and therefore face less incentives to jeopardize their capital market reputation through risk-shifting, such as investing in excessively risky projects. Again, given their stronger interaction with lending markets, both in terms of size and frequency, private equity sponsors might benefit more from their reputation in terms of looser covenant settings than traditional corporate borrowers (e.g. Diamond, 1989; Demiroglu and James, 2010a). Taken together, the reduction of *information asymmetry costs* – be it either in the form of lower screening, monitoring and/or reputation-related costs – implies a looser covenant setting.

The *increased financial risk* argument is based on the fact that private equity investors increase the leverage levels of their portfolio companies considerably. There are two underlying reasons why private equity investors lever companies up. They are interested in capitalizing on the incentive and tax benefits of debt (Jensen, 1986; Modigliani and Miller, 1963).[2] Additionally, private equity sponsors face agency problems with limited partners due to their option-like compensation structure which induces them to over-invest (Axelson et al.,

[2] i.e. they are interested in increasing leverage up to the margin where the tax and incentive benefits equal the bankruptcy costs.

2009). In consequence, an increase in the leverage levels – be it due to either the tax and incentive benefits of debt and/or agency problems on behalf of the private equity sponsors – leads to stronger incentives for borrowers to engage in risk-shifting. In anticipation of this, lenders will include tighter covenant settings in the credit agreements.

On the background of the tension between these two predictions, this paper tries to answer two main questions: how does the covenant menu in terms of individual covenant types and combinations differ in sponsored and non-sponsored loans? How restrictive are covenants in sponsored loans and what is the effect of the competing *reduced information asymmetry costs* and *increased financial risk* arguments on covenant restrictiveness?

In order to address these questions, we construct an LBO and several benchmark datasets. The proprietary LBO dataset consists of 130 German LBO transactions from 2000 to 2008 which covers approximately 40% of the German LBO market. Germany represents a fruitful institutional setting for understanding covenants since it is an economy with strong creditor rights (e.g. La Porta et al., 1997; Djankov et al., 2006) where covenants can be directly enforced in the case of a default (Lerner et al., 2009) and hence are subject to rigorous ex-ante negotiations. Our LBO dataset includes detailed covenant information gathered from the credit agreements and financial forecasts for the portfolio companies negotiated between the banks and private equity sponsors. The sample comprehends 23 lead arrangers and 66 private equity sponsors which largely operate on an international basis. We are not aware of any fundamental reason why the findings based on this sample cannot be extended to other countries. The benchmark datasets consist of non-sponsored loans with covenant information extracted from Dealscan.

In order to answer our first question we compare the covenant menu of sponsored and non-sponsored loans in terms of the following seven covenant types highlighted by researchers (Chava and Roberts, 2008; Demerjian, 2010) and practitioners: (1) Debt to

EBITDA (D/EBITDA), (2) EBITDA to interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage), (4) Capex, (5) Net Worth, (6) Debt to Equity (D/E) and (7) Current Ratio covenants.

We document that the covenant structures in non-sponsored loans are less standardized than in sponsored loans. With regards to the individual use of covenants, we encounter only the first four covenants in sponsored loans while we observe all seven covenants in non-sponsored loans. With regards to the combinations of covenants, we find that the most frequent combination in sponsored loans - which contains D/EBITDA, EBITDA/I, CashFlowCoverage, and Capex covenants - is found in 68% of the sponsored sample. In contrast, the most frequent combination in non-sponsored loans - which comprehends D/EBITDA and EBITDA/I covenants - is encountered in only 13% of the sponsored sample. In line with this observation, we document that sponsored loans restrict more financial ratios (3.64) than non-sponsored loans (2.81).

Why is this the case? One intuitive explanation is that the increased financial risk argument may outweigh the reduced information asymmetry costs argument. We examine this conjecture by comparing the sponsored loans with a subsample of non-sponsored loans where the borrowers have similar financial risk. Surprisingly, at least to us, the results remain virtually unchanged: sponsored loans still include more covenants (3.64) than non-sponsored loans (2.78) when controlling for financial risk. This result is robust to several alternative benchmark samples. The second and remaining explanation is that sponsored loans contain more covenants but they may be less restrictive. We try to examine this conjecture by investigating covenant thresholds, the restrictiveness proxy available for the benchmark sample. We observe that the covenant thresholds are mechanically driven by financial risk. Hence, thresholds represent only a precise restrictiveness measure when they are set in relation to the expected financial ratio. This is methodologically challenging as stated by

Ivashina and Kovner (2010).[3] Hence, we are not able to substantiate our remaining explanation formally.

In order to answer our second question, i.e. how restrictive are covenants in LBOs and what are the effects of information asymmetry costs and financial risk, we investigate covenant restrictiveness in sponsored loans in terms of the D/EBITDA covenant headroom. The headroom represents the negotiated percentage deviation between the lead arranging bank and the private equity investor that the limited financial ratio is allowed to deteriorate from the agreed forecast before covenant breach.

Controlling for borrower, transaction, time and macroeconomic effects, we find evidence for both the *reduced information asymmetry costs* argument (Ivashina and Kovner, 2010) and the *increased financial risk* argument: an increase in assets under management (as proxy for the reduced information asymmetry costs) of €1 billion or one standard deviation results in a significantly higher D/EBITDA covenant headroom of 30 basis points or 128 basis points, respectively (at a mean of 23.2 percent headroom). An increase in the D/EBITDA multiple (as proxy for the increased financial risk argument) by 1x or one standard deviation reduces the D/EBITDA covenant headroom by 70 basis points or 134 basis points, respectively. Hence, the tightening of financial covenants due to increasing financial risk is mitigated through the PE sponsors' reduction of information asymmetry costs.

These results are robust to numerous checks: (1) We show that leverage both from a practical and econometrical point of view is not endogenous to covenant restrictiveness. (2) We prove that alternative financial risk and information asymmetry costs proxies lead to comparable results. (3) We control for different EBITDA definitions between deals which could introduce measurement errors in the cross-sectional analyses of EBITDA-based covenants.

[3] For further details, please see section 3.2.1.

These findings contribute to both the LBO literature and the covenant literature. Covenants as non-price credit terms have received very little attention in the LBO literature until now due to the limited availability and quality of data. Only recently, two notable contributions have helped to shed light on these essential components of the debt package. Ivashina and Kovner (2010) examine the effect of *private equity investors' bank relationships* on the credit terms for their portfolio companies. They proxy for covenant restrictiveness with an indirect slack measure[4] and document, amongst other things, that stronger banking relationships lead to looser D/EBITDA covenants. The authors indicate, however, that their results are constrained by the indirect slack measure and the relatively limited covenant information disclosed in DealScan.[5] In a related paper, Demiroglu and James (2010a) focus on the effect of *private equity investors' reputation* on the lending terms of private equity portfolio companies. They investigate the covenant structure with a simple count measure of restricted financial ratios and do not find that higher reputation leads to fewer covenants. Their results are, however, limited to the representativeness of the number of covenants as a measure for restrictiveness.[6] As pointed out by Ivashina and Kovner (2010), more covenants might not necessarily be more restrictive when covenants are customized for borrowers. Also, different types of covenants are likely to be not equally valuable to lenders.

We contribute to these valuable insights on covenants in LBOs in the following ways: (1) we provide a detailed picture of the financial covenant menu in terms of types and combinations relative to a benchmark of non-sponsored loans, (2) we provide a detailed insight into the institutional covenant setting process and calculate precise covenant

[4] For details, please see section 3.2.1.

[5] DealScan reports for 29% of their sponsored loan sample D/EBITDA covenant information while the DealScan population with available covenant information suggests that D/EBITDA covenants are included in 82% of sponsored loans (Ivashina and Kovner, 2010).

[6] Furthermore, their results are based on a sample of public-to-private transactions. Strömberg (2008) shows that public-to-private deals between 2001 and 2007 account for only 6.7% (28%) of the private equity market in terms of transactions numbers (values). Chung (2009) suggests that public-to-private deals are fundamentally different from private-to-private deals. He documents that the former are motivated by the reduction of agency free cash flow problems (overinvestment) while the latter serve to alleviate investment constraints (growth).

restrictiveness measures based on the proprietary data[7], (3) we complement the results of Ivashina and Kovner (2010) and Demiroglu and James (2010a) for the r*educed information asymmetry costs* argument by opposing it to the competing *increased financial risk* argument.

This paper is also related to Axelson et al. (2010) and Kaplan and Stein (1993) who show that (1) the amount, repayment schedules and tranche partitions of debt and (2) buyout pricing are driven by marketwide conditions of debt. These results suggest that the availability of debt financing contributes to boom and bust cycles in buyout markets. Our study contributes to their work by investigating covenants as a further central credit term. This is particularly interesting since covenants – at least from a theoretical point of view – may be used to balance the pro-cyclical developments in the credit terms documented by Axelson et al. (2010).

Our research also contributes to the still limited general literature on financial covenants (Chava and Roberts, 2008; Roberts and Sufi, 2009; amongst others). The contribution is to present more precise restrictiveness estimates not distorted by common accounting problems on the background of an appealing setting: LBOs concentrate ownership and control creating an interesting setting for capital structure decisions which are less distorted by agency conflicts between managers and owners. Further, the negotiations about significant debt amounts in LBOs without already existing debtholder structures and their associated claims provides a clear view on the influence of shareholders and debtholders on covenants.

The remainder of the paper is organized as follows. Section 2 describes the construction of both the LBO and benchmark sample. Section 3 contains the analyses of financial covenants. In a first step, we describe the covenant menu of sponsored loans and benchmark it against non-sponsored loans (section 3.1). In a second step, we provide an in-depth

[7] We were able to receive the credit documentation and the financial forecasts for the portfolio companies. These proprietary data pieces enable us to circumvent conventional problems in measuring covenants restrictiveness as encountered in previous studies. For details, please see section 3.2.1.

examination of the covenant restrictiveness of sponsored loans based on our proprietary data (section 3.2). Finally, section 4 concludes.

2. Data

2.1 LBO SAMPLE

We collected the proprietary LBO sample from the leveraged finance departments of three major European commercial banks. The query included all completed transactions for which these banks functioned as lead arrangers or co-lead arrangers, i.e. they were responsible for structuring the credit terms and conditions. Loan data was omitted when the bank did not finance the deal in the end, either because the private equity group (PEG) finally chose another bank or the PEG did not complete the LBO. At all three banks, we were granted access to the following proprietary documents:[8] the complete underwritten senior and subordinated loan contracts (text file), the original syndication memorandum (text file) and the underlying financial models (Excel file). Deals were excluded when the documents appeared to be inconsistent[9] (eight deals). The provided documents were the relevant documents at transaction date, i.e. the day of closing of the transaction. Potential post-closing amendments were not taken into consideration to maintain consistency between the provided documents and to reflect the ex-ante expectation of the banks at origination date.

The documents were screened for all relevant data including sources and uses of the transaction financing, historical (t = -3 to t = -1), actual[10] (t = 0), and projected financial statements (t = 1 to t = 5), ownership structures, financial and non-financial covenants.

[8] Disclosure rules in Germany are similar to disclosure rules in the US. Unless there are public securities outstanding financial reports do not have to be filed. The disclosure of loan contracts is optional. LBO loan information, in particular financial covenants, is typically kept private.

[9] For example, there were credit documents which had different covenant thresholds compared to the financial models.

[10] Underlying financial information at deal date is validated by auditors.

In total we screened the credit documentation of 134 highly leveraged transactions in Germany from 2000 to 2008. Of these transactions, 130 were sponsored by 66 private equity groups, 4 were corporate takeovers and therefore omitted from the final sample. Similar to Kaplan and Ruback (1995) we included 21 leveraged recapitalizations as they are identical to LBOs except that this type of transaction does not include the repurchase of the entire company's stock. Additionally, conversations with bankers reveal that they do not perceive any difference in terms of deal structuring between PE-sponsored LBOs and recapitalizations.[11]

The sample is based on data from three banks, therefore it is not a random sample and it is important to discuss potential selection issues. We were granted access to the banks highly confidential credit documentation due to prior research relationships. The banks did not filter their loans for our analysis. This is supported by the fact that several loans in the dataset were in default during the data aggregation. Deals that the bank did not finance in the end and/or the private equity sponsor lost the auction were omitted from the sample. As deals are often arranged by more than one bank, the sample includes deals from 23 different lead arranging banks and on average an LBO was arranged by 1.96 lead arrangers. The LBOs in our sample were sponsored by 66 different private equity groups, which represent 39% of all private equity members[12] of the German PE and VC association (BVK e.V.). We also observed seven deals where the private equity sponsor was bank-affiliated, e.g. Goldman Sachs Capital Partners (Principal Investment Area) is affiliated to Goldman Sachs & Co. We had only three deals where the deal was sponsored by a PEG that is affiliated to the lead arranging bank.[13]

Panel A of Table I shows that our transactions (excluding recapitalizations) represent more than 40 percent of the total LBO transaction volume of the German buyout market

[11] Controlling for recapitalizations in our cross-sectional analysis does not change our reported results.
[12] Excluding sole VC members.
[13] Our results are unaffected by the in- or exclusion of these deals.

between 2000 and 2008.[14] Compared to the Western European market, the world's single largest private equity market, the sample covers about 6.7 percent of the CMBOR data and approx. 5.8 percent of the sample aggregated by Strömberg (2008) in the same period.

Panel B benchmarks the distribution of deal types in our sample with those of the global, Western European, and German private equity market in the covered period between 2000 and 2008.[15] While much of the existing literature focuses on public-to-private transactions, the low share in the sample (1.8% in terms of deal numbers) is representative for Western European (2.4%) and German (1.5%) private equity activity. However, our share is lower when compared to the global sample (6.8%) of Strömberg (2008).[16] The majority of deals in the sample consists of divisional buyouts (35.8%) and private-to-private buyouts (34.9%). Though the individual shares of these two private buyout types deviate from the various benchmark samples, the aggregate share (70.7%) is in line with the benchmarks (73.2% Global, 84.2% Western Europe, 71.8% Germany). We oversample secondary transactions in the study (26.6%) in comparison to the benchmarks (16.8% Global, 14.8% Western Europe, 13.2% Germany).

[Insert Table I here]

Table II presents statistics on the size, pricing and capital structure of the transactions. The sample contains large deals: The median LBO enterprise value (EV) is €230.5 million compared to the median €42.4 million reported in Capital IQ.[17] The median deal is priced at an EV to EBITDA multiple of 6.9. Clearly, the majority of the buyout price is financed with debt: the median deal shows a D/EBITDA multiple of 4.3 and the equity contribution amounts

[14] Transactions smaller than €10 million are omitted from the market volume. Transactions with an enterprise value of less than €10 million are mostly financed by government-backed banks and not financed by syndicated loans.

[15] The Strömberg (2008) sample is only available from 2001 to 2007.

[16] The difference is that in Germany there are (1) less publicly listed companies and (2) regulatory hurdles, e.g. there has been no formal implementation of a squeeze out rule before 2002/2006 (in 2002, the 'aktienrechtliche Squeeze-out' had been introduced while in 2006, the 'übernahmerechtliche Squeeze-out' had been introduced.

[17] As reported by Strömberg (2008). We convert the 2007 US dollar values with the yearly average exchange rate of 1.36775.

to 33.5%. Across time, we observe the typical boom and bust pattern although the trends are not always statistically significant. Debt (equity) levels increase (decrease) during the boom time 2004-2007 while they decrease (increase) with the financial crises in 2008. Overall, these pricing and capital structure statistics are broadly in line with recent work by Axelson et al. (2010).[18]

[Insert Table II here]

Given the rich nature of the proprietary data, we can also provide a detailed picture of the financing terms of the debt package. Debt in buyouts includes senior and subordinated financing for which separate credit agreements regulate the claims of the lenders against the borrower.[19] Covenants, as the primary unit of analysis, are commonly more restrictive in senior credit agreements in order that senior lenders are enabled to receive control rights in advance of subordinated claims. Hence, the covenant analysis in section 3 will be based on the senior debt package. Consequently, we will focus the discussion of spreads and maturities on the senior part of debt.[20] Table III details the spreads and maturities.

[Insert Table III here]

We document that spreads and maturities are remarkably homogenous for all senior debt tranches. In the cross section, 65% (93%) of the deals have a Term A spread of 2.25% (between 2.0 and 2.5%) and 82% have a Term A maturity of 84 months. Over time, the median Term A spread varies in a statistical sense over the three observation periods[21], but the respective median values of 2.25, 2.25 and 2.5 highlight the fact that the changes are small in

[18] Axelson, et al. (2010) report a median EV/EBTIDA of 7.6, D/EBITDA of 5.2x and D/EV of 70% for 1142 worldwide LBOs. Although being reasonably close to our sample, when conditioning their sample on (1) our Western Europe setting and (2) our proprietary focus one private-to-private and divisional transactions (i.e. deals which are usually undersampled in commercial databases due to their invisibility), their pricing and capital structure statistics are almost identical.

[19] Senior debt includes A, B, C term loans, a revolving credit facility and a capex facility (Kaplan and Stein, 1993). Revolving credit facility and capex facility have the same terms as Term A loans and are therefore not included in the Table. Subordinated debt comprehends second lien notes and mezzanine financing.

[20] The spreads for the subordinated tranches show more variation than the senior tranches. The maturities for the subordinated tranches remain highly standardized.

[21] The observation periods are 2000-2003, 2004-2007 and 2008, respectively.

economic terms. Similarly, the respective median Term A maturity is in economic terms fairly stable over time. These patterns hold for all senior debt tranches and confirm Kaplan and Stein's (1993) results for the first buyout wave as well as recent anecdotal evidence by S&P (2010).[22] The high uniformity in pricing is remarkable. If we assume a set of companies with the same financial but different total risk (e.g. due to industry-specific cash flow dynamics), one would expect lenders to charge these different companies different loan prices (Kaplan and Stein, 1993). There are several possible explanations for this. For instance, banks reduce the amount of debt they hold in their own books and pass on a larger share to other banks and institutional investors). Another explanation for the relatively small variation in loan prices are 'non-price terms of credit' which may be used by lenders to adjust their risk-return payoff. Our unit of analysis – covenants – represents one (if not the) central class of such non-price credit terms.

2.2 BENCHMARK SAMPLE

In order to evaluate the covenant menu of sponsored loans, we construct benchmark samples of non-sponsored loans from Reuters' LPC DealScan database (DealScan). DealScan reports comprehensive information on syndicated loan deals, including the set of covenants and their respective thresholds. Each loan deal usually consists of several facilities, for example a term loan and a 364-revolving credit line. While certain credit characteristics, such as interest spreads, are set at the individual facility level, covenants are determined at the loan deal level (e.g. Bradley and Roberts, 2004; Demerjian, 2010). Hence, the analysis focuses at the deal level.[23]

We aim to construct benchmarks which mirror the loan deal characteristics (i.e. the type of loan facilities and the loan purpose) of the sponsored loan packages closely. Therefore, we

[22] For details see Polenberg, et al. (2010).
[23] We consolidate facility-specific credit characteristics, such as interest spreads, to the deal level by weighting them with the facility size.

construct two benchmark samples. The primary sample consists of all non-sponsored loan packages which include term loan facilities since these facilities provide the majority of debt financing in buyouts (Axelson et al., 2010). In addition to this primary sample, we construct an alternative benchmark sample which includes exclusively non-sponsored loan deals (including term loans) for the purpose of corporate acquisitions (Ivashina and Kovner, 2010). We include deals with covenant information from Dealscan during the period of 2000 to 2008. Since we aim to control for financial risk, we condition both samples on the availability of Compustat data for the borrower.[24] This results in 1423 deal observations for the term loan sample and 795 observations for the acquisition sample. We select the term loan sample as the primary benchmark since it contains more observations for the analysis. The results are, however, stable across both benchmark samples.[25]

3. Analysis of financial covenants

The central objective of this paper is to understand covenants in LBO contracts. In section 3.1, we describe the covenant menu of sponsored loans and benchmark it against non-sponsored loans. In section 3.2, we provide an in-depth examination of the covenant restrictiveness of sponsored loans based on proprietary information.

3.1 THE MENU OF FINANCIAL COVENANTS

Financial covenants constitute limits on the level of accounting figures expressed in both, relative and absolute value (e.g. Bradley and Roberts, 2004; Tirole, 2006). In transactions with senior and subordinated financing, there are two credit agreements which regulate the claims of the lenders against the borrower and an intercreditor agreement that regulates the claims between senior and subordinated lenders. While both the senior and the subordinated

[24] In particular, we match our borrowers to Compustat via both the company names and tickers provided by DealScan.
[25] The results for the acquisition sample can be found in the appendix.

credit agreement include separate financial covenants, senior debt covenants are commonly more restrictive in order to enable senior lenders to receive control rights in advance of subordinated claims. Financial covenant restrictiveness – in contrast to the mere inclusion of covenants – is typically not standardized and is subject to negotiation between borrowers and intermediaries or lenders.

Financial covenants can be classified into two mutually exclusive fundamental categories: incurrence and maintenance financial covenants. The former category of covenants is tested only in case the borrower takes, or attempts to take, certain ex-ante defined actions which might extract wealth from debtholders such as dividend payments or the issuance of additional debt. This type of financial covenants restricts the actions of borrowers if certain accounting-based thresholds are not satisfied. By contrast, maintenance covenants have to be met on an ongoing basis over the term of the loan, independent of any explicit wealth-shifting attempts of the borrower. Generally, lenders perceive maintenance covenants as wealth-increasing in comparison to incurrence covenants as they are assumed to yield generally higher recovery rates in case of payment default.[26] Leveraged loans traditionally incorporate maintenance financial covenants. However, in overheated credit markets leveraged loans might incorporate incurrence covenants instead of maintenance covenants. Such a structure which includes incurrence covenants only is generally known as a 'covenant-lite' deal in leveraged buyouts.[27]

Table IV focuses on the inclusion of separate covenants in sponsored loans and the respective benchmark of non-sponsored loans.

[Insert Table IV here]

[26] S&P estimates that loans with maintenance covenants have 8 percent to 14 percent higher recovery rates (see Lai and Bavaria, 2007).

[27] Our sample includes only one covenant-lite deal. This is representative of the Western European market where the first covenant-lite deal was originated in March 2007 for the refinancing of VNU World Directories by Cinven and Apax Partners. See http://www.efinancialnews.com/story/09-04-2007/covenant-lite-loans-appear-on-european-buyout-stage.

Following previous research (Chava and Roberts, 2008; Demerjian, 2010), the classification scheme by DealScan and discussions with industry experts, we consider the following set of seven financial covenants in the analysis: (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlow-Coverage), (4) Capex, (5) Net Worth, (6) Debt to Equity (D/E) and (7) Current Ratio covenants. We document that sponsored loans focus on the first four of these seven covenants, i.e. D/EBITDA[28], EBITDA/I, CashFlowCoverage and Capex restrictions. These covenants are included in almost all sponsored loan agreements (97%, 80%, 97% and 74%) but to a significantly lower degree in non-sponsored loan agreements (71%, 46%, 56% and 40%). Indeed, sponsored loans include no further covenant types whereas some non-sponsored loans include Net Worth (29%), D/E (15%) and Current Ratio (5%) covenants. The differences in the inclusion frequencies between the sponsored and non-sponsored sample are statistically significant for all seven covenant types (at the 1% level except for the Current Ratio covenant). As Panel B suggests, these patterns seem to be relatively stable across different economic time periods.

Besides the use of individual financial covenants, it is interesting to note how they are used in interaction. Table V documents the probabilities of encountering a specific covenant conditional on the existence of another covenant. Panel A focuses on the sponsored loans and Panel B reports the non-sponsored benchmark.

[Insert Table V here]

As expected, the conditional probabilities in the sponsored sample (Panel A) are high between all four premier covenants (D/EBITDA, EBITDA/I, CashFlowCoverage and Capex covenants) while they are zero if any of the three remaining covenants (D/E, Current Ratio and Net Worth) are considered. In the non-sponsored sample (Panel B), the conditional

[28] We include Senior D/EBITDA in the D/EBITDA category of covenants.

probabilities are more evenly distributed between all seven covenants. This pattern indicates that there is less variation in the set of covenant combinations for the sponsored than for the non-sponsored sample. Table VI examines this notion in greater detail by investigating the frequencies of the premier covenant combinations for both samples: The most frequent combination in sponsored loans, which contains D/EBITDA, EBITDA/I, cash flow coverage, and capex covenants, is found in 68% of the sponsored sample. In contrast, the most frequent combination in non-sponsored loans, which comprehends D/EBITDA and EBITDA/I covenants, is encountered in only 13% of the sponsored sample.[29] Hence, the covenant structure in terms of covenant combinations is more standardized in sponsored than in non-sponsored loans.

[Insert Table VI here]

The aforementioned statistics for the individual covenants from Table IV translate into the observation that sponsored loans restrict more financial ratios than non-sponsored loans. On average, sponsored loan deals include 3.64 covenants, whereas their non-sponsored counterparts comprehend 2.81 covenants, the difference being statistically significant at the 1% level. Having documented this difference, the natural question which arises is why?

One obvious explanation is the *increased financial risk* argument: the underlying financial risk of the loans might be much higher for sponsored than for non-sponsored loans leading to a more restrictive covenant package. To test this explanation we try to control for differences in the D/EV and D/EBITDA levels of sponsored versus non-sponsored loans. Hence, we collect financials for the non-sponsored loan sample from Compustat for the financial year following the loan issuance. Indeed, looking at D/EBITDA and D/EV in Panel C of Table IV reveals that the borrowers of sponsored loans have significantly higher leverage

[29] Similarly, if we extend our analysis to the top three covenant combinations, we observe that one of these premier combinations is present in 90% of the sponsored sample while we find that one of these combinations is inherent in only 32% of the non-sponsored sample.

levels than non-sponsored borrowers. There are two interesting questions: (i) are there non-sponsored loans with comparable leverage levels, and if there are comparable loans (ii) how does their covenant structure compare to sponsored loans. As a simple test we sort the benchmark sample according to D/EV (or D/EBITDA which yields identical results) and look at the characteristics of the quartile of loans with the highest financial risk. We find that this highest leverage quartile of non-sponsored loans exhibits comparable financial risk (D/EV=68% and D/EBITDA=5.64) to the sponsored loan sample, the difference being statistically insignificant (p-value 0.30 and 0.35 respectively).[30] This seems particularly puzzling as the *information asymmetry costs* argument would suggest that sponsored loans would receive a looser covenant setting when financial risk is similar to non-sponsored loans.

The findings may be inaccurate if our benchmark is not appropriate. In order to investigate this possibility, we (i) conduct the same procedure with loans used for acquisition purposes, (ii) we build industry-year-leverage matches for both the term loan and acquisition samples.[31] We notice that the results remain virtually the same across all samples (see appendix for the acquisition sample results; the industry-year-leverage matched benchmarks are available upon request). This strengthens our belief that the results are not systematically biased by the benchmarking choice.

Another intuitive explanation for our findings is that sponsored loans contain more covenants but they may be less restrictive. We try to shed light on this issue by investigating the covenant thresholds, the proxy of restrictiveness available for our benchmark sample.

[30] We are confident that our non-sponsored borrowers are not in distress as syndicated loans are typically not provided to distressed companies. Table AIII in the appendix compares borrower and loan characteristics for our sponsored and non-sponsored sample.

[31] With respect to the financial risk of our borrowers, we match our sponsored loans to non-sponsored loans according to year, industry and leverage. In particular, we identify all companies that have originated a syndicated loan in the same year as the LBO target company. We then retain those companies that operate in the same two-digit SIC industry. In case there are fewer than 5 potential matched firms, we base ourselves on the one-digit SIC code. The peer firm is then the firm whose financial risk measure is closest to that of the LBO target company.

Table VII reports the results for the sponsored as well as the non-sponsored loans. Non-sponsored loans are divided into quartiles according to their financial risk (D/EV).[32]

[Insert Table VII here]

In the following we focus on the comparison of covenant thresholds between the sponsored loans and the fourth quartile of non-sponsored loans with the highest financial risk (in the following called 'fourth quartile').[33] We find a mixed picture across the three main covenants. The threshold of the D/EBITDA covenant is almost identical in sponsored (5.02) and fourth quartile (5.30) loans, the difference being statistically insignificant (p-value of 0.11). The thresholds for the EBITDA/I and CashFlowCoverage covenant are different between sponsored and non-sponsored loans (both with a p-value < 0.01), however in opposite directions. While the mean sponsored loan has a 0.75 (27%) higher EBITDA/I threshold, it actually has a 0.25 (24%) lower CashFlowCoverage threshold compared to the mean non-sponsored loan. Again, we investigate whether these results may be subject to a selection bias in our benchmark sample. We calculate the thresholds for all alternative benchmark samples but the findings remain the same.

What seems a likely explanation is that thresholds as *absolute* values of financial ratios may not represent a direct measure of covenant restrictiveness as already indicated by Ivashina and Kovner (2010). Indeed, our data supports this notion: in all four benchmark quartiles, the thresholds (D/EBITDA, EBITDA/I and CashFlowCoverage) vary monotonically across the quartile subsamples (Table VII). For example, we observe that the D/EBITDA threshold grows monotonically with increasing leverage levels (from 3.39 in the first quartile to 5.30 in the fourth quartile). These results suggest that thresholds are directly driven by the

[32] Sorting the sample according to D/EBITDA leads to virtually identical results.

[33] Our D/EBITDA financial risk variable is larger than the covenant thresholds, both for sponsored and non-sponsored loans. This would indicate that the average loan is in covenant breach. However, covenants are typically tested for the first time twelve months after loan inception. During this period the borrower is expected to reduce the outstanding debt and typically increase EBITDA, leading to an expected financial ratio that is considerably below the covenant threshold.

underlying financial risk of the borrower and do not represent a direct measure of covenant restrictiveness.

Hence, we are not able to formally test the conjecture that sponsored loans may include more but less restrictive covenants than non-sponsored loans. However, the rich nature of our proprietary LBO dataset will allow us in the next section to provide an in-depth examination of the covenant restrictiveness for sponsored loans. We will be able to precisely determine the magnitude of covenant restrictiveness and thereby to test our competing arguments of the impact of *information asymmetry costs* and *financial risk* on covenant restrictiveness.

3.2 FINANCIAL COVENANT RESTRICTIVENESS

3.2.1 Understanding Financial Covenant Restrictiveness

In the previous section, we have shown that thresholds seem to be linked to the level of financial risk. For instance, we have noticed that D/EBITDA thresholds increased with underlying leverage levels. This observation underlines the concern that thresholds as an *absolute metric* may not be a sharp measure of covenant restrictiveness. Using thresholds as a measure of covenant restrictiveness does not indicate how close the threshold is set to the expected ratio, i.e. how in danger the company is to violating the covenant. For instance, firm A might have a D/EBITDA threshold of 6/1 with a current D/EBITDA ratio of 4/1, while firm B has a D/EBITDA threshold of 7/1 and a current D/EBITDA ratio of 6.5/1. Evidently, firm B is more in danger of violating a covenant, i.e. has a more restrictive D/EBITDA covenant, all else being equal. In order to address this concern, studies usually follow an indirect approach and control for all relevant financial risk variables at the right-hand side in a multivariate framework.

Alternatively studies directly calculate the covenant slack (i.e. the distance to default) as a measure of covenant tightness. The covenant slack is defined as the difference between the

covenant threshold and the expected future ratio at a defined point in time. The greater the slack the looser the covenant since the borrower's financial ratio can deteriorate by a larger amount before triggering a covenant violation. Since information on the expected performance of the borrower is hard to obtain, researchers generally calculate the actual slack. For instance, Dichev and Skinner (2002) calculate the difference between the covenant threshold and the actual reported ratio. Therefore, the actual slack is the result of two factors, i.e. the ex ante set covenant tightness and the ex post realized performance of the borrower. In our example, firm A would have a slack of 2/1 (6/1-4/1) and firm B of 0.5/1 suggesting that firm B has a more restrictive D/EBITDA covenant. But we would not know whether this tight covenant is the result of a poor performance of firm B or a tight covenant setting at loan origination, or both. A further concern with the actual slack as a measure for restrictiveness is that the definition of the input variables for the covenant and the actual realized ratio may vary. To minimize these inaccuracies, most studies that calculate the actual slack use net worth and current ratio covenants that have relatively few adjustments (see Dichev and Skinner, 2002). However, net worth and current ratio covenants are rarely used in LBOs. Given the nature of our dataset, we are able to address these concerns by calculating the slack as the difference between the D/EBITDA covenant threshold and the *expected* future D/EBITDA at the first testing date.[34] Still, the slack is not a perfect apples-to-apples measure of covenant tightness in the cross-section. Comparing D/EBITDA slack across different deals might introduce measurement errors since the definition of the input parameters (i.e. debt and EBITDA) may vary across deals (Lawler, 2007).

Besides the covenant threshold and slack, it is interesting to revisit the process of how financial covenant thresholds – which are documented in the credit agreement (see Figure I) – are determined. In the beginning the private equity group identifies a target company, which it

[34] The testing date is the point in time when financial ratios are calculated and compared to the financial covenant threshold in the credit agreement.

plans to bid on and therefore sends a business plan to potential lead arranging banks. Based on the provided information, lead arrangers decide on whether to submit a term sheet to the sponsor. The term sheet typically includes rough estimates of the debt package including interest margins, debt package, maturity as well as types of financial covenants. In the case where the sponsor agrees to the term sheet, the sponsor sends his detailed operational model ('sponsor case'), which includes the sponsor's estimate for EBITDA and unlevered cash flow[35], to the lead arranging bank. Based on the provided operational information and its own due diligence, the lead arranger adjusts the sponsor's case to his own assumed growth rates for EBITDA and unlevered free cash flow. Based on this forecast, the lead-arranging bank and the PEG negotiate a final debt package, including debt volume and instruments as well as repayment and interest schedules. The combination of the operational forecast and the debt package constitutes the 'financing case', which is disclosed to potential syndication partners. The financing case contains explicit quarterly forecasts typically covering the next five years for key financial variables such as debt, interest, repayments, as well as operational variables like EBITDA and unlevered cash flow. These forecasts constitute the basis for negotiating financial covenants.

A numerical example of how financial covenant thresholds are calculated is shown in Figure II. It starts from the given financial forecast for debt and EBITDA, which are combined in the projected ratio of D/EBITDA (here 5.7x for Q2 2010). The PEG and the lead arranger then negotiate the so-called headroom, which is the percentage of the projected EBITDA that the borrower might deteriorate. In our example, the lead arranger expects the buyout company to achieve an EBITDA of €22.3m in Q2 2010. Applying a 25% headroom, the company is allowed to achieve a 25% lower EBITDA than originally projected, i.e. €16.7m or 75% of €22.3m. To arrive at the ratio in the credit agreement, the projected debt

[35] Unlevered cash flow equals free cash flow before interest. It is identical to free cash flow for a 100% equity financed firm.

level is divided by the allowed EBITDA, for Q2 2010 the covenant threshold is projected to be 7.6x. This procedure can also be constructed by applying the headroom to the forecasted ratio [5.7x/(1-0.25)]. However, in the practical world the headroom calculation on the EBITDA has prevailed because it is not ambiguous when comparing the headroom across different types of financial covenants. For instance, while one needs to *divide* the D/EBITDA ratio by one minus headroom, you need to *multiply* the EBITDA/I by one minus headroom to arrive at the same implied EBITDA level (see Figure III for a formalization of the headroom calculations for the different types of covenants).[36] One obvious question is why the credit agreement includes ratios and not minimum EBITDA levels? In the ex ante perspective debt is a given variable and EBITDA the performance of the borrower. In the ex post perspective, i.e. during the loan, the lender wants to monitor the risk of the outstanding loan – taking into account historical repayments – which is best captured by the D/EBITDA ratio rather than the EBITDA level.

Practitioners view headroom as the single most influential factor determining the restrictiveness of financial covenants.[37] As a managing director of Bain Capital stated:

> *'… The tightness of financial covenants is one of the most essential items during loan negotiations. We would rather accept higher margins than reducing headrooms. Breaching covenants can lead to wiping out our equity position while higher margins only reduce our IRR …'*

Comparing the slack to the headroom, it is straightforward to see that the slack is the result of the underlying leverage of the transaction and a multiplier which is determined by the headroom.

[36] For our prior example of firm A and firm B, firm A would have a headroom of 33.3% [-(4/6-1)] and firm B a headroom of 7.1% [-(6.5/7-1)]. Therefore, firm A enjoys looser covenants as compared to firm B.

[37] The headroom is also one of the crucial items when selling LP stakes. In his analysis the potential buyer looks closely at the headrooms of the respective portfolio companies. If the headroom is very small, potential buyers typically do not attribute any value to the equity stake of the portfolio company.

3.2.2 Univariate analysis of financial covenant restrictiveness

Table VIII presents the thresholds and headrooms of the three main financial covenants in LBOs, namely D/EBITDA, EBITDA/I and CashFlowCoverage. We document the development of thresholds and headrooms over the first three years after the transaction (i.e. t=1 to t=3) for both the whole sample and subsamples of loans negotiated in different years. Panel A reports thresholds while Panel B reports headrooms.

[Insert Table VIII here]

Panel A shows that D/EBITDA covenant thresholds typically decrease from t=1 to t=3, being mechanically driven by the reduction of debt and the expected increase of EBITDA (assuming constant headroom). In contrast to the D/EBITDA threshold, the EBITDA/I threshold increases over the planning horizon (t=1 to t=3). This observation is also mechanical, since interest payments stay fairly stable – as only the relatively lower spread Term A loan is redeemed – and EBITDA is mostly forecasted to grow (again assuming a constant headroom). The CashFlowCoverage threshold experiences very little variation from t=1 to t=3, it is predominantly set to 1.0. This seems striking, as financial covenants are presumably utilized to serve as a signal for the state of the firm so that lenders can intervene early to limit wealth reduction. However, if a CashFlowCoverage covenant of 1 is violated, the firm cannot satisfy its debt obligations from its ongoing cash flows.[38]

If we split our loan sample into the time periods 2000-2003 (pre credit boom), 2004-2007 (credit boom) and 2008 (post credit boom), we observe the following trends. As expected, the D/EBITDA thresholds increase in the presumably overheated 2004-2007 period (significant at

[38] Only if the existing cash level is sufficient to cover outstanding payments or if equity injections by sponsors are made, can the firm avoid payment default. However, banks should not expect borrowers to have any cash on hand or private equity sponsors to inject additional equity. Indeed, there have only been a few equity injections by private equity sponsors in the 2008/2009 period. Thus, assuming neither of the two aforementioned possibilities, this setting would not give the lender any time to intervene before they would be confronted with default payments. Consequently, it seems that lenders may apply some specific logic to their financial covenant setting where the CashFlowCoverage covenant is used as a signal of last resort.

the 5% level) while the EBITDA/I and CashFlowCoverage decrease (significant at the 1% level). In 2008, while the D/EBITDA (EBITDA/I) thresholds tend back towards lower (higher) levels, none of the trends is statistically significant. A potential reason for this result may be the relatively limited sample of 8 observations in the 2008 period.

Panel B presents headrooms for the sample. In contrast to thresholds, headrooms are easier to interpret as they provide a direct view of the restrictiveness of financial covenants. We generally find that financial covenants are stricter in the early years of the planning horizon and are relaxed over time from t=1 to t=3. While all three financial covenants adhere to this schematic, the D/EBITDA covenant shows a faster relief (delta of medians t = 1 versus t = 3 equals (29.3 - 23.3) equals 6.0 percentage points) than the EBITDA/I (delta of medians t = 1 versus t = 3 equals 2.0 percentage points) and the CashFlowCoverage covenant (delta of medians t = 1 versus t = 3 equals 3.4 percentage points). This observation lends strong evidence to the *financial risk* argument since the forecasted headrooms present a quasi ceteris paribus setting: only the financial risk changes from t=1 to t=3 but everything else remains constant at the date of transaction.

Interestingly, when we split our loan sample again into the 2000-2003 (pre credit boom), 2004-2007 (credit boom) and 2008 (post credit boom) periods, we notice that the headrooms stay considerably stable across the different economic time periods. With the exception of the EBITDA/I headroom in t=3, there are no statistically significant trends across the periods.

3.2.3 Multivariate analysis of financial covenant restrictiveness

3.2.3.1 Explanatory variables

In order to test whether *financial risk* and/or *information asymmetry costs* impact the restrictiveness of financial covenants we construct several proxies for each of our two main determinants. Table IX Panel A provides descriptive statistics for these variables.

[Insert Table IX here]

Similar to Axelson et. al. (2010) we use two different measures for *financial risk*: net debt divided by earnings before interest and depreciation (D/EBITDA) and net debt divided by the enterprise value (D/EV). The leverage of the LBOs in our sample exhibit comparable leverage levels to previous studies.[39] The average LBO has a D/EBITDA multiple of 4.4x and finances 66% of the enterprise value with debt. Both leverage measures show considerable variation with a standard deviation of 1.5x for D/EBITDA and 9.6 percentage points for D/EV.

In order to measure reduced *information asymmetry* costs we construct several variables. A prominent measure for reduced information asymmetry in the lending market is the size of the private equity group (PEG). We calculate the size of the PEG by aggregating the capital committed to the funds of the PEG over the last five years before the transaction, which mirrors the procedure applied by Private Equity International (*PEG size*). We obtained committed capital from fund data included in Thomson Venture Economics (TVE). The average PEG had €3 billion under management at the date of the deal. Due to the inclusion of very large PEGs such as, e.g. KKR, Bain Capital, Goldman Sachs Capital Partners, Carlyle, among others, the standard deviation is €5 billion. Another way to measure reduced

[39] For example Axelson et. al. (2010) report a mean D/EBITDA of 5.6x and a mean D/EV of 69% for 1142 LBOs. When conditioning their sample on (1) our Western Europe setting and (2) our proprietary focus on divisional and private-to-private transactions (i.e. deals which are usually undersampled in commercial databases due to their invisibility) their leverage statistics are likely to be highly similar to ours.

information asymmetry costs has been proposed by Gompers and Lerner (1999). They argue that investors learn about the characteristics and behavior of private equity organizations over time. Therefore we use the lifetime of a PEG as another proxy for reduced information asymmetry costs (*PEG lifetime*). We aggregate the age of the private equity organization at transaction date by using the fund database of TVE. We then check the year of the first fund with available public information coming directly from the PEG. If the data from TVE and the public information do not match, we use the information provided directly from the PEG. The average PEG in the sample has a lifetime of 15.6 years with a standard deviation of 12.3 years. As an additional measure for reduced information asymmetry costs we use the frequency of interactions with the syndicated loan market. Therefore, we count the number of transactions a PEG was able to complete before the respective deal in our sample (*PEG number of deals*). We collect all deals recorded in TVE and MergerMarket during three years prior to the transaction. The average deal in our sample was sponsored by a PEG which completed 17.4 deals before the respective transaction with a standard deviation of 17.3.

Table IX Panel B presents the correlation matrix for our measures for information asymmetry costs. We find that the three measures are highly and significantly correlated. For reasons of brevity, we present our regressions estimated for *PEG size.* The alternative proxies lead to qualitatively similar results.

Besides the aforementioned variables that primarily measure the repeated interaction with debt markets we also try to capture the reduction of information asymmetry costs caused by the degree of repeated interaction between individual banks and PEGs. Similar to Ivashina and Kovner (2010) and Bharath et al. (2007), we measure banking relationship by the value of loans in the previous five years underwritten by the lead arranging bank divided by the total value of all loans sponsored by the respective private equity group as reported in DealScan (*Banking relationship)*. In case more than one bank functioned as lead arranger, the highest

among these values is selected. The average *Banking relationship* is 23.2% with a standard deviation of 26.5% across LBO firms. However, we perceive that the banking relationship variables might be subject to a selection bias, as Dealscan exhibits lower coverage of European small cap deals, which results in a large number of a zero banking relationships (27%), which we know is actually incorrect for many deals observed in our dataset. Therefore, we do not include a separate variable for banking relationship in our regressions. In our analysis we do not differentiate between reduced information asymmetry costs based on repeated interaction with the lending market or the repeated interaction between specific banks and respective PEGs.

In order to control for company characteristics we include profitability at transaction, size categories and expected EBITDA growth. To control for market conditions we include the credit spread between AAA and BB corporate debt during the month of the transaction. Furthermore, we test our results for year and industry fixed effects to eliminate time variations in market conditions.

3.2.3.2 Results

In Table X we examine the determinants of financial covenant restrictiveness in senior bank loan contracts of buyout firms using a sample of 130 buyouts.[40] Since the D/EBITDA covenant is the most important covenant in LBOs, the D/EBITDA covenant headroom is typically the heaviest negotiation item during the covenant setting process. In our analysis we use the most restrictive, i.e. smallest, headroom of the D/EBITDA covenant in the first two years after the transaction as the dependent variable.[41] We run ordinary least square regressions (OLS) and the coefficients represent the percentage point change of the headroom dependent on a change of the independent variable. As White- and Breusch-Pagan-tests

[40] The final sample includes 126 observations for the D/EBITDA headroom.
[41] In the vast majority of the cases, the covenant headroom was tightest at the first testing date, i.e. one year after the transaction.

indicate heteroskedasticity of the estimated residuals, we use heteroskedasticity-consistent (Huber-White) standard errors for estimating p-values.

Further, the independent variables used for *leverage*, *profitability* and *growth*, raise concerns that the models suffer from multicollinearity. However, the variance inflation factors (VIF) of these variables are less than 1.28 in all models, suggesting that multicollinearity is not severe.

[Insert Table X here]

In regression (1), the baseline specification, we model the D/EBITDA headroom as a function of PEG size, leverage, profitability, expected EBITDA growth and credit risk spread. We find that PEG size significantly increases the D/EBITDA headroom. An increase of assets under management by €1 billion or one standard deviation (approx. €5 billion) results in a higher D/EBITDA covenant headroom of 30 basis points or 128 basis points, respectively (at a mean of 23.2 percent headroom and a standard deviation representing 6.6 percent points headroom).

In line with theoretical and empirical literature, we show that leverage, i.e. more financial risk, leads to more restrictive financial covenants, i.e. lower headroom – being robust for both D/EBITDA and D/EV (see specification 2 for the latter). Leverage, however, might be an endogenous variable, as it not only affects financial covenant restrictiveness, but also vice versa, covenant restrictiveness might have an influence on leverage (Billett et al., 2007). While a detailed analysis of this potential problem is provided in Section 3.2.3.3. on robustness below, our results show that our models do not exhibit endogeneity, which is supported by characteristics regarding the process of financial covenant determination. Therefore, increasing the D/EBITDA multiple by 1x reduces the leverage headroom by 70 basis points (a one standard deviation increase results in a 134 basis points reduction in headroom).

Increased profitability, measured as EBITDA/sales[42] at transaction (t = 0), leads to significantly less restrictive covenants, i.e. higher D/EBITDA headroom. This finding suggests that lenders perceive past profitability as a signal that future behavior of management will be positive and therefore lenders grant more flexibility to management in terms of less restrictive financial covenants. An EBITDA margin, which is higher by one percentage point or one standard deviation, increases the leverage headroom by about 19 basis points or 187 basis points, respectively.

We also find strong evidence that financial covenants are less restrictive for higher growth firms, i.e. receive higher D/EBITDA headroom. Accordingly, increasing the expected EBITDA growth forecast over the first three years after the buyout by one percentage point or one standard deviation increases the D/EBITDA headroom by 28 basis points or 173 basis points, respectively. Substituting EBITDA growth by expected sales growth yields robust results. Whereas theory predicts different directions we find direct evidence that shareholders and management of high-growth firms value flexibility more than shareholders of comparable low-growth firms. At first, this finding appears to contradict the results of many scholars, e.g. Billett et al. (2007)[43], who suggest that higher growth firms receive more restrictive covenants. But most past studies evaluate covenant protection by the mere counting of action-restricting covenants in the context of agency theory. Our research design allows us to draw direct conclusions regarding the potential shift of control rights, which are not in conflict with action-restricting covenants, but are complementary and might adhere to a different economic logic. Previous literature shows that high growth firms receive more action-restricting

[42] In our view EBITDA/sales is a better proxy for profitability than EBITDA/assets because assets represent the purchase price at t = 0. Therefore, EBITDA/assets would be the reciprocal of the EBITDA multiple of the enterprise value and highly negatively correlated with leverage, leading to multicollinearity problems. However, including EBITDA/assets does not change the results and profitability remains highly significant in all models.

[43] Billett et al. (2007) find a significant relationship for the growth proxy market-to-book, although they did not find any significant relationship for their sales growth proxies.

covenants; however, we show that they negotiate greater flexibility for their financial covenants.

We do not find a statistically significant influence of macroeconomic conditions on covenant restrictiveness of leveraged loans. However, as intuition suggests the credit spread between AAA and BB bonds is negatively related to headroom. In other words, the more risk averse the credit suppliers, the more restrictive are financial covenants.

Interestingly, model 3 shows that the size of the firm does not have a significant impact on financial covenant restrictiveness. One explanation might be that potential lenders in the credit market are more concerned with the reputation of the sponsor than with the target, implicitly transferring the sponsor-related reputation to the borrowing firm. Removing the size of the PEG does not alter the coefficients and t-values of the size variables. Anecdotal evidence supports this argument. Practitioners state that if KKR were to buy a significantly smaller than usual company they would still enjoy favorable credit terms. We could not test for this effect because there are very few deals where a small company was acquired by a high reputation PEG, and vice versa.

3.2.3.3 Robustness

To begin with, the pooled OLS regression shown in model 5 of Table X accounts for industry and time fixed effects. The standard errors are clustered by industry and deal year, a method also used by Axelson et al. (2010). It shows that our results are robust against the inclusion of such effects.

Besides the outlined advantages of the headroom as a measure of covenant restrictiveness, the headroom might also be exposed to the same measurement error as slack and threshold in the cross-section due to varying definitions of D/EBITDA in LBOs. In order

to address this potential issue, we test our results for robustness by including a measure for the restrictiveness of the EBITDA definition in the credit agreements.

Being well aware of the low comparability of the definitions in loans, the Loan Market Association (LMA) tries to standardize definitions used to calculate financial covenants in credit agreements. As Mark Campbell, Head of Global Finance of Clifford Chance put it: '… *LMA covenants [definitions] define exactly what EBITDA is for the purposes of the document* … '.[44] While the final definitions in the individual credit agreements may differ from the LMA standard, LMA definitions are typically used as a starting point to negotiate the definitions of covenants. Over the course of the deal process, definitions are possibly customized, depending on the negotiation between lead arranger and sponsor.

To control for the effect of definitions, we measure the deviation of the deal-specific EBITDA definition to the standardized LMA definition for EBITDA in leveraged loans. Specifically, we count the number of add-backs to net income to arrive at EBITDA. If the credit agreement contains less add-backs than the LMA standard the dummy variable *Strict EBITDA Definition* is set to 1. If the credit agreement contains more add-backs than the LMA standard the dummy variable *Loose EBITDA Definition* is set to 1.[45]

Further, many scholars suspect and find evidence for simultaneous causality between leverage and covenant restrictiveness (e.g. Bradley and Roberts, 2004; Billett et al., 2007). Their analysis, however, focuses on the mere existence of covenants and not on the inherent restrictiveness of financial covenants. Negotiations on leverage take place at the beginning of the loan arrangements (mostly at the proposal stage), while the restrictiveness of financial covenants (i.e. headroom) is negotiated during the final phase of the loan arrangement (for a

[44] For the full article of Clifford Chance on financial covenants see (last visited on 30.05.2010): http://www.cliffordchance.com/expertise/publications/details.aspx?FilterName=@URL&LangID=UK&contentitemid=13406

[45] EBITDA being the most important item in financial covenant calculations is also a good proxy for other relevant covenant inputs, such as, e.g. debt. For a list of potential add-backs see Lawler (2007), p. 13.

more detailed description see Ivashina and Kovner, (2010). Hence, we conceptually expect no problem of endogeneity, i.e. that the level of headroom has a causal effect on the level of leverage in our models of financial covenant restrictiveness. Nonetheless, in order to test for these effects we conducted Wu-Hausman tests. We used all-in-drawn spread as an instrument for the suspected endogenous leverage variable: like leverage, all-in-drawn spread, defined as the value-weighted sum of the spreads over EURIBOR of the utilized senior and subordinated tranches, is a parameter of the credit contract that is set at the beginning of the loan negotiations and should be exogenous to the financial covenant models for several reasons: First, the pricing of the different tranches in leveraged loans is mostly driven by credit markets and therefore experiences very low variations as also noted for buyouts in the 1980s by Kaplan and Stein (1993). Second, standardized spreads are characteristic for European credit markets, in contrast to spreads in the US which are negotiated to be more flexible as indicated by Demiroglu and James (2010a) and Ivashina and Kovner (2010). Finally, our interviews with lead arrangers and private equity sponsors support the assumption that there is no link between spreads and financial covenant restrictiveness.

Further, all-in-drawn spread as defined above, is a relevant variable, as leverage and all-in-drawn spread are strongly correlated (correlation coefficient: 0.44). This relationship is mechanical as more expensive subordinated debt is used in more highly leveraged transactions (Axelson et al., 2010). Regressing leverage on all-in-drawn spread results in a highly significant coefficient (t-value of 5.36, i.e. a p-value of 0.00). The Wu-Hausman tests indicate no relevant endogeneity in the models, since the residuals on leverage from the reduced form regression have no significant impact on D/EBITDA headrooms in the initial structural form.

An additional concern might be the adequateness of our measure for covenant restrictiveness. According to Dichev and Skinner (2002), borrowers might engage in

accounting manipulation to avoid financial covenant violation. This behavior might reduce the effectiveness of financial covenants overall and thus the importance of their restrictiveness. However, several reasons argue against a substantial accounting manipulation in leveraged loans. First, lead arrangers have considerable experience in originating and monitoring loans, reducing the ability of borrowers to *'consistently fool private lenders via accounting manipulation'* (Chava and Roberts, 2008). Second, building on the first argument, lead arrangers define financial covenants in great detail and the calculations are specified ex ante and implemented in the financial models.[46] Third, credit agreements constitute a 'GAAP freeze', which does not allow any changes in accounting principles. Fourth, the quarterly calculation of financial covenants during the lifetime of the loan has to be certified by auditors and the chief financial officer of the firm. Finally, evidence suggests that managers prefer to cut investments rather than manipulate accounts in order to prevent covenant violations (Graham et al., 2005; Chava and Roberts, 2008).[47]

4. Conclusion

Private equity investors are important providers of capital for companies. Still, we know relatively little about the detailed financial structure of LBOs (Axelson et al., 2010). We are the first to provide a detailed view on financial covenants in LBOs. From a theoretical point of view, it is not clear whether the covenant setting in private equity sponsored loans should be different in comparison to traditional non-sponsored loans and, in particular, whether it should be more or less restrictive: On the one hand, more frequent and larger in scale interactions of private equity investors with the lending market should *reduce information asymmetry costs* which in turn leads to less restrictive covenant structures for sponsored

[46] For definition guidelines, see the loan market association. In practice, definitions are individually negotiated and can become quite complex.

[47] While cutting investment does not improve financial covenants directly, the cash preserved by not undertaking investments is considered in the net debt calculation.(Net debt = Debt – Cash).

loans. On the other hand, however, *higher financial ris*k due to increased leverage levels of LBOs should lead to more restrictive covenant structures for sponsored loans. Hence, it is an empirical matter.

We first present evidence that the covenant structure in terms of types and combinations is more standardized in sponsored loans than in non-sponsored ones. Our sponsored loan sample includes only four specific covenant types while the non-sponsored sample contains seven. The most frequent covenant combination for sponsored loans is found in 68% of their cases while the respective premier covenant combination of non-sponsored loans is only encountered in 13% of their sample. Furthermore, sponsored loans restrict more financial ratios (3.64) than non-sponsored loans (2.81). We show that this result is not caused by the higher financial risk of sponsored than non-sponsored borrowers. What seems a more likely explanation is that sponsored loans include more but less restrictive covenants than non-sponsored borrowers.

In a second step, we take a detailed look at covenant restrictiveness. By measuring restrictiveness precisely with the D/EBITDA covenant headroom, i.e. calculating the distance between covenant thresholds and financial forecasts, we document that our two competing arguments both have economically large effects: an increase in PEG's assets under management as proxy for reduced information asymmetry costs, by one standard deviation decreases the D/EBITDA covenant headroom by 128 basis points (at a mean of 23.2%). An increase in the debt to EBITDA multiple as proxy for the increased financial risk argument, by one standard deviation increases the D/EBITDA covenant headroom by 134 basis points.

Taking into account that financial covenants regained high significance as control mechanisms in LBOs after the recent credit crunch, future research seems worthwhile. An interesting and important research question, which has not been examined sufficiently, is the impact of financial covenants on the probability of (payment) default and loss-given default,

similar to Zhang (2009) for corporate debt. A related question is how private equity groups react to defaults and what impacts their behavior. Another important issue is the information asymmetry between private equity sponsors, lead arrangers and participants in the loan. Furthermore, the restrictiveness of financial covenants might be related to additional contractual clauses. The reason is that financial covenants might serve as guard posts in the relationship between arranger and participant, while less transparent agreements are set between arranger and sponsor to the detriment of the syndicate participants.

References

Acharya, V. V., Hahn, M and Kehoe, C. (2008) Corporate Governance and Value Creation: Evidence from Private Equity, unpublished working paper, CEPR.

Aghion, P. and Bolton, P. (1992) An Incomplete Contracts Approach to Financial Contracting, *Review of Economic Studies* **59**, 473-494.

Aghion, P., Hart, O. and Moore, J. (1992) The Economics of Bankruptcy Reform, *Journal of Law, Economics, & Organization* **8**, 523-546.

Allen, F., Bartiloro, L. and Kowalewski, O. (2006) The Financial System of the EU 25, unpublished working paper, Wharton School, University of Pennsylvania.

Axelson, U., Strömberg, P., and M. Weisbach (2009) Why are buyouts levered? The financial structure of private equity firms, *The Journal of Finance* **64**, 1549-1582.

Axelson, U., Jenkinson, T., Stromberg, P. and Weisbach, M. S. (2010) Borrow cheap, buy high? The determinants of leverage and pricing in buyouts, unpublished working paper, National Bureau of Economic Research.

Bharath, S., Dahiya, .S., Saunders, A. and Srinivasan, A. (2007) So What Do I Get? The Bank's View of Lending Relationships. *Journal of Financial Economics* **85**, 368-419.

Billett, M. T., King, T.-H. D. and Mauer, D. C. (2007) Growth Opportunities and the Choice of Leverage, Debt Maturity, and Covenants, *The Journal of Finance* **62**, 697-730.

Bradley, M. H. and Roberts, M. R. (2004) The Structure and Pricing of Corporate Debt Covenants, unpublished working paper, The Fuqua School of Business, Duke University.

Burrows, A. and Wright, M. (2008) European Management Buy-outs, The Centre for Management Buy-out Research, Nottingham.

Chava, S. and Roberts, M. R. (2008) How does Financing Impact Investment? The Role of Debt Covenant Violations, *The Journal of Finance* **63**, 2085-2121.

Chung, J.-W. (2009) Leveraged Buyouts of Private Companies, job market paper, Fisher College of Business, Ohio State University.

Demerjian, P. (2010) Financial Covenants, Credit Risk, and the Resolution of Uncertainty, unpublished working paper, Emory University.

Demiroglu, C. and James, C. M. (2010a) The Role of Private Equity Group Reputation in Buyout Financing, *Journal of Financial Economics* **96**, 306-330.

Demiroglu, C. and James, C. M. (2010b) The Information Content of Bank Loan Covenants, *The Review of Financial Studies*, forthcoming.

Diamond, D. W. (1989) Reputation Acquisition in Debt Markets, *Journal of Political Economy* **97**, 828-862.

Dichev, I. D. and Skinner, D. J. (2002) Large-sample evidence on the debt covenant hypothesis, *Journal of Accounting Research* **40**, 1091-1123.

Djankov, S., McLiesh, C. and Shleifer, A. (2007) Private Credit in 129 countries, *Journal of Financial Economics* **84**, 299-329.

Gompers, P. and Lerner, J. (1999) An analysis of compensation in the U.S. venture capital partnership, *Journal of Financial Economics* **51**, 3-44.

Graham, J., Harveya, C. and Rajgopalc, S. (2005) The economic implications of corporate financial reporting, *Journal of Accounting and Economics* **40**, 3-73.

Hart, O. (1995) Firms, Contracts, and Financial Structure, Oxford University Press, Clarendon Press, Oxford and New York.

Ivashina, V. and Kovner, A. (2010) The Private Equity Advantage: Leveraged Buyout Firms and Relationship Banking, *The Review of Financial Studies*, forthcoming.

James, C. (1987) Some Evidence on the Uniqueness of Bank Loans, *Journal of Financial Economics* **19**, 217-235.

Jensen, M. C. (1986) Agency Costs of Free Cash Flow, Corporate Finance and Takeovers', *American Economic Review* **76,** 323-329.

Kaplan, S. N. and Ruback, R. S. (1995) The Valuation of Cash Flow Forecasts: An Empirial Analysis, *The Journal of Finance* **50**, 1059-1093.

Kaplan, S. N. and Stein, J. C. (1993) The Evolution of Buyout Pricing and Financial Stucture in the 1980s, *Quarterly Journal of Economics* **108**, 313-357.

Lai, A. and Bavaria, S. (2007) The Leveraging of America: Covenant-Lite Loan Structures Diminish Recovery Prospects, Standard & Poor's.

Lawler, P. (2007) What private equity firms want in a lender, *Commercial Lending Review* **22**, 9-17.

Lerner, J., Stromberg, P. and Sorensen, M. (2009) What Drives Private Equity Activity and Success Globally?, unpublished working paper, World Economic Forum, Geneva and New York.

Modigliani, F. and Miller, M. H. (1963) Corporate income taxes and the cost of capital: a correction, *American Economic Review* 53, 433-443.

Myers, S. C. (1977) Determinants of corporate borrowing, *Journal of Financial Economics* **5**, 146-175.

Polenberg, R., Lukatsky, M. and Gupte, S. C. (2010) A primer for the European syndicated loan market, Standard & Poor's.

Roberts, Michael R. and Sufi, Amir (2009) Renegotiation and financial contracts: Evidence from private credit agreements

Smith, C. W. J. and Warner, J. B. (1979) On Financial Contracting: An Analysis of Bond Covenants, *Journal of Financial Economics* **7**, 117- 161.

Strömberg, P. (2008) The new demography of private equity, unpublished working paper, Swedish Institute for Financial Research, Stockholm School of Economics, CEPR, NBER.

Tirole, J. (2006) The theory of corporate finance, Princeton University Press, Princeton, New Jersey.

Zhang, Z. (2009) Recovery rates and macroeconomic conditions: The role of loan covenants, unpublished working paper, Carroll School of Management, Boston College.

Figure I
EXEMPLARY EXCERPT OF FINANCIAL COVENANTS IN A CREDIT AGREEMENT

1. **FINANCIAL COVENANTS**

1.1 **Financial condition**

The Company shall ensure that:

(a) the ratio of Consolidated Cash Flow to Net Debt Service will not be less than 1:1 for any Relevant Period.

(b) the ratio of Debt on each Relevant Date set out in the table below to EBITDA for the Relevant Period ending on that Relevant Date will not exceed the ratio set out in the relevant column in the table below opposite that Relevant Date;

(c) the ratio of EBITDA to Interest for each Relevant Period ending on a Relevant Date set out in the table below will not be less than the ratio set out in the relevant column in the table below opposite that Relevant Date;

Relevant Date	Debt to EBITDA	EBITDA to Interest
30 June 2010	7.60 : 1	1.90 : 1
30 September 2010	7.50 : 1	1.90 : 1
31 December 2010	7.20 : 1	2.00 : 1
31 March 2011	7.10 : 1	2.00 : 1
30 June 2011	6.80 : 1	2.00 : 1
30 September 2011	6.70 : 1	2.00 : 1
31 December 2011	6.50 : 1	2.00 : 1
31 March 2012	6.30 : 1	2.00 : 1
30 June 2012	6.10 : 1	2.00 : 1
30 September 2012	5.90 : 1	2.00 : 1
31 December 2012	5.70 : 1	2.00 : 1

Figure II
EXEMPLARY FINANCIAL COVENANT CALCULATION

COVENANT CALCULATION		FY 2010			FY 2011			
		Q2	Q3	Q4	Q1	Q2	Q3	Q4
Transaction date 31.12.2009		30-Jun-10	30-Sep-10	31-Dec-10	31-Mar-11	30-Jun-11	30-Sep-11	30-Dec-11
	Source	First covenant test date						
D/EBITDA COVENANT								
Input from Financing Case								
Debt	*Forecast*	126,788	125,771	123,800	122,776	120,758	119,686	117,461
EBITDA	*Forecast*	22,250	22,500	22,850	23,200	23,550	23,900	24,275
D/EBITDA forecast	***Forecast***	**5.7x**	**5.6x**	**5.4x**	**5.3x**	**5.1x**	**5.0x**	**4.8x**
Senior Debt Covenants								
Headroom (% Change in EBITDA)	*Input*	25%	25%	25%	25%	25%	25%	25%
Allowed EBITDA	*Calc*	16,688	16,875	17,138	17,400	17,663	17,925	18,206
D/EBITDA Covenant	*Calc*	**7.6x**	**7.5x**	**7.2x**	**7.1x**	**6.8x**	**6.7x**	**6.5x**
EBITDA/I COVENANT								
Input from Financing Case								
EBITDA	*Forecast*	22,250	22,500	22,850	23,200	23,550	23,900	24,275
Interest	*Forecast*	8,826	8,808	8,788	8,856	8,810	8,762	8,818
EBITDA/I forecast	***Forecast***	**2.5x**	**2.6x**	**2.6x**	**2.6x**	**2.7x**	**2.7x**	**2.8x**
Senior Debt Covenants								
Headroom (% Change in EBITDA)	*Input*	25%	25%	25%	25%	25%	25%	25%
Allowed EBITDA	*Calc*	16,688	16,875	17,138	17,400	17,663	17,925	18,206
EBITDA/I Covenant	*Calc*	**1.9x**	**1.9x**	**2.0x**	**2.0x**	**2.0x**	**2.0x**	**2.1x**

Figure III
FORMALIZATION OF HEADROOM CALCULATION

$$HR_{D/EBITDA} = -\left(\frac{EBITDA_{Cov}}{EBITDA_{FC}}\right) - 1 = -\left(\frac{\frac{Net\ debt_{FC}}{EBITDA_{FC}}}{\frac{Net\ debt_{FC}}{EBITDA_{Cov}}}\right) - 1$$

$$HR_{EBITDA/I} = -\left(\frac{EBITDA_{Cov}}{EBITDA_{FC}}\right) - 1 = -\left(\frac{\frac{EBITDA_{Cov}}{Interest_{FC}}}{\frac{EBITDA_{FC}}{Interest_{FC}}}\right) - 1$$

$$HR_{CashFlowCoverage} = -\left(\frac{Cash\ flow_{Cov}}{Debt\ service_{FC}}\right) - 1 = -\left(\frac{\frac{Cash\ flow_{Cov}}{Debt\ service_{FC}}}{\frac{Cash\ flow_{FC}}{Debt\ service_{FC}}}\right) - 1$$

Table I
SAMPLE COMPARISON

Panel A presents the € volumes of LBOs in the sample in relation to the German and Western European LBO market by year. Volume figures are in millions €, based on 2008 prices. Comparisons to market studies are in percent. The sample includes 109 private equity backed LBOs completed in Germany between July 2000 and August 2008. Due to comparability to the benchmarks, recapitalizations are excluded. Total enterprise value excludes transaction costs (due diligence, arrangement fees etc.). Information on market figures is obtained from two sources. First, market data is aggregated from the Centre for Management Buy-out Research (CMBOR) at Nottingham University Business School and includes all PE and non-PE sponsored LBOs larger than €10 million in transaction value completed in Germany, and Western Europe respectively, over the entire sample period. Year 2008 market figures are for the first 6 months only. Second, the sample is compared to the comprehensive dataset of Strömberg (2008) covering the period 2001-2007. Panel B benchmarks the distribution of buyout types in our sample with those of the aforementioned studies. Here, we resort to the global data of the dataset by Strömberg (2008). In divisional buyouts the PE sponsor acquires only a part of the company. Private-to-private transactions refer to acquisitions of non-listed companies. In turn, public-to-privates are delistings of previously public companies. In secondary buyouts the companies were owned by institutional investors, e.g. other PE sponsors. Others include buyouts of distressed companies and unknown deal types.

Panel A: Sample coverage

Deal year	**No. of transactions**	**EV**	**Sample coverage (EV) of**		
		(€ millions)	**Germany** *(CMBOR data)*	**Western Europe** *(CMBOR data)*	**Western Europe** *(Strömberg 2008)*
2000	1	77	0.4%	0.1%	0.1%
2001	2	3366	42.3%	5.4%	5.4%
2002	6	4874	51.4%	7.3%	6.7%
2003	7	3197	24.1%	4.9%	4.7%
2004	17	13838	67.5%	16.8%	11.6%
2005	19	8769	60.5%	6.8%	4.6%
2006	26	6792	27.8%	4.0%	2.6%
2007	24	13947	52.7%	8.1%	8.2%
2008	7	2756	42.9%	7.4%	NA
Total	**109**	**57540**	**40.2%**	**6.7%**	**approx. 5.8%**

6.7%

Panel B: Benchmarking by type of deal

Buyout type	**Sample number of transaction**	**Sample share**	**Germany 2000-2008** *(CMBOR 2009)*	**Western Europe 2000-2008** *(CMBOR 2009)*	**Global 2001-2007** *(Strömberg 2008)*
Divisional	39	35.8%	54.0%	39.6%	36.3%
Private-to-private	38	34.9%	17.8%	44.6%	36.9%
Public-to-private	2	1.8%	1.5%	2.4%	6.8%
Secondary	29	26.6%	13.2%	14.8%	16.8%
Other	1	0.9%	13.4%	13.2%	3.2%

Table II
KEY VALUATION AND FINANCING DATA

The Table presents market trends in Germany during the July 2000 to August 2008 period for 130 PE sponsored LBOs and recaps. Transaction total capital equals transaction total sources (or uses). Transaction value (enterprise value) excludes transaction costs. Net debt equals total debt less cash and cash equivalents. Senior debt includes term loan facilities (A, B, C, and D tranches) as well as second-lien loans but excludes revolving credit facilities. EBITDA equals the pro-forma figure for the end of fiscal year of the transaction (t=0). Equity contribution is the equity to transaction total capital ratio with equity including common and preferred equity, earn-outs as well as shareholder and vendor loans. The bottom panel reports time trends for our variables across the following three periods which approximate the private equity cycle: 2000 to 2003 (pre credit boom), 2004 to 2007 (credit boom) and 2008 (post credit boom). We test the significance of our time trends with Wilcoxon rank-sum tests. *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Deal year	Statistics	No. of transactions	**Transaction total capital**	**Transaction value to EBITDA**	**Leverage (Net debt to EBITDA)**	**Equity contribution**
			(€ millions)	x	x	(as % of total capital)
2000	Median	1	65.0	6.5	3.9	33.1
2001	Median	2	1493.6	5.9	3.6	37.6
2002	Median	6	332.3	7.7	3.9	46.6
2003	Median	7	55.4	4.7	3.3	43.1
2004	Median	20	705.0	7.3	4.6	30.4
2005	Median	28	252.5	7.0	4.3	27.7
2006	Median	30	123.6	6.6	4.4	32.6
2007	Median	29	202.0	7.6	4.8	33.1
2008	Median	7	273.1	7.9	4.1	37.5
Total	**Median**	**130**	**230.5**	**6.9**	**4.3**	**33.5**
Time trends:						
Pre credit boom (00-03) VS. credit boom (04-07)			(-)	(+)	(+)**	(-)***
Credit boom (04-07) VS. post credit boom (08)			(+)	(-)	(-)	(+)***

Table III
DETAILED FINANCING DATA - SPREADS AND MATURITIES

The Table presents annual means and medians of maturity and spreads of the financial sources used in our sample of 130 LBOs arranged between July 2000 and August 2008. The bottom panel reports time trends for our variables across the following three periods which approximate the private equity cycle: 2000 to 2003 (pre credit boom), 2004 to 2007 (credit boom) and 2008 (post credit boom). We test the significance of our time trends with Wilcoxon rank-sum tests. *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Deal year	Statistics	Maturity term A loans (months)	Spread term A loans (as %)	Maturity term B loans (months)	Spread term B loans (as %)	Maturity term C loans (months)	Spread term C loans (as %)	Maturity second lien loans (months)	Spread second lien loans (as %)	Maturity mezzanine tranche (in months)	Cash spread mezzanine tranche (as %)	PIK spread mezzanine tranche (as %)	All in drawn spread (as %)	All in drawn senior spread (as %)	Credit risk spread (as %)
2000	Median	72.0	2.50	84.0	3.00					116.0	4.15	.	2.95	2.66	2.18
	n	1	1	1	1					1	1		1	1	1
2001	Median	84.0	2.25	96.0	2.75	108.0	3.38	.	.	120.0	5.00	3.00	3.27	2.60	9.40
	n	2	2	2	2	2	2	.	.	1	1	1	2	2	2
2002	Median	84.0	2.25	96.0	2.75	108.0	3.25	.	.	120.0	5.00	4.50	3.96	2.55	5.68
	n	6	6	6	6	3	3	.	.	5	5	5	6	6	6
2003	Median	84.0	2.50	96.0	2.75	108.0	3.25	.	.	108.0	5.00	5.00	3.04	2.55	3.67
	n	7	7	5	5	3	3	.	.	3	3	3	6	7	7
2004	Median	84.0	2.25	96.0	2.75	108.0	3.25	114.0	5.50	120.0	5.00	6.00	3.94	2.63	1.77
	n	20	20	19	19	18	18	3	4	11	12	12	19	19	20
2005	Median	84.0	2.25	96.0	2.75	108.0	3.25	114.0	5.50	120.0	4.75	5.50	3.53	2.67	2.40
	n	28	28	28	28	25	25	11	10	18	17	17	26	26	28
2006	Median	84.0	2.25	96.0	2.75	108.0	3.06	114.0	4.75	120.0	4.50	5.25	2.93	2.53	1.86
	n	27	27	29	29	18	18	6	6	16	15	16	28	30	30
2007	Median	84.0	2.25	96.0	2.75	108.0	3.19	114.0	4.50	120.0	4.35	5.13	3.43	2.56	1.32
	n	25	25	29	29	20	20	9	8	14	16	16	27	27	29
2008	Median	84.0	2.50	96.0	3.00	108.0	3.50	.	.	120.0	4.50	5.50	4.42	2.94	4.74
	n	7	7	7	7	7	7	.	.	5	5	5	7	7	7
Total	**Median**	**84.0**	**2.25**	**96.0**	**2.75**	**108.0**	**3.25**	**114.0**	**4.75**	**120.0**	**4.50**	**5.25**	**3.45**	**2.61**	**2.12**
	n	**123**	**123**	**126**	**126**	**96**	**96**	**29**	**28**	**74**	**75**	**75**	**122**	**125**	**130**
Time trends:															
Pre credit boom (00-03) VS. credit boom (04-07)		(+)**	(-)***	(+)	(-)***	(+)	(-)**	n.m.	n.m.	(+)***	(-)***	(+)	(-)	(+)	(-)***
Credit boom (04-07) VS. post credit boom (08)		(+)	(+)***	(-)	(+)***	(-)	(+)***	n.m.	n.m.	(+)	(+)	(-)	(+)**	(+)***	(+)***

Table IV
FREQUENCY OF FINANCIAL COVENANTS

The Table presents the inclusion of financial covenants in (1) 130 PE sponsored loans, (2) 1423 non-sponsored term loans and (3) 355 non-sponsored term loans which represent the highest borrower D/EV quartile of the second sample. Following previous research (Chava and Roberts, 2008; Demerjian, 2010), the classification scheme by DealScan and discussions with industry experts, we consider the following set of seven financial covenants in our analysis: (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage), (4) Capex, (5) Net Worth, (6) Debt to Equity (D/E) and (7) Current Ratio covenants. Panel A presents the covenant frequency in the cross-section, while Panel B depicts the covenant frequency over time, i.e. over the following three time periods: 2000 to 2003 (pre-credit boom), 2004 to 2007 (credit boom), and 2008 (post-credit boom). Panel C documents the financial risk of the borrowers in terms of D/EBITDA and D/EV. The Debt component includes the revolving credit facility to ensure comparability. The Wilcoxon tests refer to the differences between the sponsored loan sample and (a) the entire sample of non-sponsored loans and (b) the highest (fourth) D/EV quartile of the non-sponsored sample.

Variables	Unit	Sponsored loans			Non-sponsored loans			Non-sponsored loans			Diff. Test (Wilcoxon)	
					All			Highest Leverage Quartile			Spons. VS All Non-Spons.	Spons. VS Highest Lev.-Quart. Non-Spons.
		Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	p value	
Panel A: Covenant frequency in the cross section												
No. of financial covenants	#	129	3.64	4.00	1,423	2.81	3.00	355	2.78	3.00	0.00***	0.00***
D/EBITDA	%	129	97%	100%	1,423	71%	100%	355	59%	100%	0.00***	0.00***
EBITDA/I	%	129	80%	100%	1,423	46%	0%	355	50%	0%	0.00***	0.00***
Cash flow	%	129	97%	100%	1,423	56%	100%	355	52%	100%	0.00***	0.00***
Capex	%	129	74%	100%	1,423	40%	0%	355	49%	0%	0.00***	0.00***
D/E	%	129	0%	0%	1,423	15%	0%	355	17%	0%	0.00***	0.00***
Current Ratio	%	129	0%	0%	1,423	5%	0%	355	3%	0%	0.00***	0.07*
Net Worth	%	129	0%	0%	1,423	29%	0%	355	30%	0%	0.00***	0.00***
Panel B: Covenant frequency over time												
2000 - 03												
No. of financial covenants	#	16	3.94	4.00	595	3.09	3.00	199	2.97	3.00	0.00***	0.00***
D/EBITDA	%	16	88%	100%	595	65%	100%	199	52%	100%	0.06*	0.01**
EBITDA/I	%	16	100%	100%	595	46%	0%	199	51%	100%	0.00***	0.00***
Cash flow	%	16	100%	100%	595	64%	100%	199	58%	100%	0.00***	0.00***
Capex	%	16	69%	100%	595	45%	0%	199	50%	100%	0.06*	0.16
D/E	%	16	0%	0%	595	22%	0%	199	22%	0%	0.04**	0.04**
Current Ratio	%	16	0%	0%	595	8%	0%	199	3%	0%	0.24	0.52
Net Worth	%	16	13%	0%	595	42%	0%	199	41%	0%	0.02**	0.03**
2004 - 07												
No. of financial covenants	#	106	3.58	4.00	748	2.62	3.00	132	2.54	3.00	0.00***	0.00***
D/EBITDA	%	106	96%	100%	748	77%	100%	132	67%	100%	0.00***	0.00***
EBITDA/I	%	106	75%	100%	748	46%	0%	132	49%	0%	0.00***	0.00***
Cash flow	%	106	96%	100%	748	50%	100%	132	44%	0%	0.00***	0.00***
Capex	%	106	74%	100%	748	39%	0%	132	49%	0%	0.00***	0.00***
D/E	%	106	0%	0%	748	10%	0%	132	8%	0%	0.00***	0.00***
Current Ratio	%	106	0%	0%	748	4%	0%	132	2%	0%	0.05**	0.20
Net Worth	%	106	2%	0%	748	19%	0%	132	15%	0%	0.00***	0.00***
2008												
No. of financial covenants	#	7	4.00	4.00	80	2.36	2.00	24	2.58	3.00	0.00***	0.00***
D/EBITDA	%	7	100%	100%	80	73%	100%	24	67%	100%	0.11	0.08*
EBITDA/I	%	7	100%	100%	80	44%	0%	24	42%	0%	0.00***	0.00***
Cash flow	%	7	100%	100%	80	43%	0%	24	46%	0%	0.00***	0.01**
Capex	%	7	100%	100%	80	21%	0%	24	33%	0%	0.00***	0.00***
D/E	%	7	0%	0%	80	18%	0%	24	25%	0%	0.23	0.15
Current Ratio	%	7	0%	0%	80	5%	0%	24	8%	0%	0.55	0.44
Net Worth	%	7	0%	0%	80	23%	0%	24	21%	0%	0.16	0.19
Panel C: Financial risk of borrowers												
D/EV	#	129	0.65	0.66	1,423	0.37	0.33	355	0.68	0.65	0.00***	0.30
D/EBITDA	#	129	5.48	5.35	1,295	3.47	2.87	305	5.64	5.08	0.00***	0.35

Table V
CONDITIONAL PROBABILITIES BETWEEN INDIVIDUAL COVENANTS

The Table presents conditional probabilities on encountering a covenant conditional on the existence of another covenant. Following previous research (Chava and Roberts, 2008; Demerjian, 2010), the classification scheme by DealScan and discussions with industry experts, we consider the following set of seven financial covenants in our analysis: (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage), (4) Capex, (5) Net Worth, (6) Debt to Equity (D/E) and (7) Current Ratio covenants. Panel A (B) reports evidence for our sponsored (non-sponsored) loans.

Panel A: Sponsored loans

Probability of a covenant in row *i*, conditional of a covenant in column *j*							
Covenant	1	2	3	4	5	6	7
1 D/EBITDA		0.81	0.98	0.77	0.00	0.00	0.00
2 EBITDA/I	0.97		0.97	0.88	0.00	0.00	0.00
3 Cash flow	0.97	0.80		0.75	0.00	0.00	0.00
4 Capex	0.98	0.94	0.97		0.00	0.00	0.00
5 D/Equity	0.00	0.00	0.00	0.00		0.00	0.00
6 Current ratio	0.00	0.00	0.00	0.00	0.00		0.00
7 Net worth	0.00	0.00	0.00	0.00	0.00	0.00	

Panel B: Non-sponsored loans

Probability of a covenant in row *i*, conditional of a covenant in column *j*							
Covenant	1	2	3	4	5	6	7
1 D/EBITDA		0.51	0.57	0.45	0.06	0.05	0.22
2 EBITDA/I	0.69		0.32	0.36	0.15	0.10	0.28
3 Cash flow	0.64	0.27		0.45	0.16	0.06	0.34
4 Capex	0.67	0.40	0.61		0.07	0.04	0.26
5 D/Equity	0.21	0.38	0.51	0.17		0.15	0.53
6 Current ratio	0.30	0.46	0.33	0.17	0.26		0.58
7 Net worth	0.34	0.31	0.47	0.27	0.23	0.15	

Table VI
THE MENU OF FINANCIAL COVENANTS

The Table presents descriptive statistics on the most frequent covenant combinations encountered in our sponsored and non-sponsored loan samples. Following previous research (Chava and Roberts, 2008; Demerjian, 2010), the classification scheme by DealScan and discussions with industry experts, we consider the following set of seven financial covenants in our analysis: (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage), (4) Capex, (5) Net Worth, (6) Debt to Equity (D/E) and (7) Current Ratio covenants.

	Unit	**Sponsored loans**	**Non-sponsored loans**
Covenant combinations			
Frequency of top 3 covenant combinations	%	90%	32%
Frequency of premier covenant combination	%	68%	13%
Structure of premier covenant combination			
D/EBITDA		yes	yes
EBITDA/I		yes	yes
Cash flow		yes	no
Capex		yes	no
D/E		no	no
Current Ratio		no	no
Net Worth		no	no

Table VII
THRESHOLDS OF FINANCIAL COVENANTS

The Table presents covenant thresholds for our sponsored and non-sponsored samples. We present means and medians for the three main covenants, i.e. the (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage),covenant. Panel A presents thresholds for the cross-section, while Panel B depicts thresholds over time, i.e. over the following three time periods: 2000 to 2003 (pre-credit boom), 2004 to 2007 (credit boom), and 2008 (post-credit boom). Statistics on the financial risk of the borrowers (D/EV and D/EBITDA) are included as well. The Wilcoxon tests refer to the differences between the sponsored loan sample and the highest (fourth) D/EV quartile of the non-sponsored sample.

	Sponsored loans			Non-sponsored loans												Wilcoxon rank-sum test*
				All			1. Quartile		2. Quartile		3. Quartile		4. Quartile			p value
	Obs.	Mean	Median	Obs.	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Obs.	Mean	Median	
Financials																
D/EV	129	0.65	0.66	1,423	0.37	0.33	0.11	0.11	0.26	0.26	0.42	0.42	355	0.68	0.65	0.30
D/EBITDA	129	5.48	5.35	1,295	3.47	2.87	1.44	1.19	2.98	2.39	4.03	3.64	305	5.64	5.08	0.35
Covenant thresholds																
Panel A: Cross section																
D/EBITDA	123	5.02	4.75	1,015	4.27	4.00	3.39	3.25	4.10	3.75	4.55	4.50	208	5.30	5.00	0.11
EBITDA/I	103	2.78	2.50	649	2.52	2.50	2.98	3.00	2.75	2.75	2.43	2.50	177	2.03	2.00	0.00***
Cash flow	125	1.02	1.00	790	1.34	1.25	1.45	1.25	1.29	1.20	1.35	1.25	185	1.27	1.20	0.00***
Panel B: Time series																
Pre credit boom (00-03)																
D/EBITDA	14	4.04	3.95	384	4.22	4.00	3.03	3.00	4.18	3.50	4.31	4.05	104	5.09	5.00	0.01**
EBITDA/I	16	3.58	3.23	271	2.42	2.25	2.98	3.00	2.78	3.00	2.37	2.45	102	2.01	1.90	0.00***
Cash flow	16	1.05	1.00	381	1.34	1.25	1.44	1.35	1.32	1.25	1.36	1.25	116	1.27	1.15	0.00***
Credit boom (04-07)																
D/EBITDA	102	5.16	4.90	573	4.36	4.00	3.55	3.25	4.08	0.00	4.80	4.60	88	5.74	5.50	0.02**
EBITDA/I	80	2.65	2.33	343	2.57	2.50	2.98	3.00	2.72	2.75	2.44	2.50	65	1.99	2.00	0.00***
Cash flow	102	1.02	1.00	375	1.33	1.25	1.46	1.25	1.27	1.20	1.30	1.25	58	1.23	1.15	0.00***
Post credit boom (08)																
D/EBITDA	7	4.87	4.19	58	3.74	3.50	3.45	3.38	3.68	0.00	3.44	3.50	16	4.29	4.00	0.42
EBITDA/I	7	2.50	2.50	35	2.73	3.00	2.93	3.00	2.77	3.00	2.52	2.75	10	2.52	2.50	0.73
Cash flow	7	1.00	1.00	34	1.51	1.30	1.59	1.35	1.34	1.25	1.74	1.25	11	1.40	1.50	0.00***

* Two-sample Wilcoxon rank-sum (Mann-Whitney) test between entire sponsored loans sample and 4th quartile (highest D/EV) of non-sponsored loans sample.

Table VIII

DEVELOPMENT OF COVENANT RESTRICTIVENESS MEASURES

The Table presents the thresholds (Panel A) and headrooms (Panel B) determined in the loan contracts to be obeyed one year (t = 1), two years (t = 2), and three years (t = 3) after the transaction was completed. We present means and medians for the three main covenants, i.e. the (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage) covenants, The bottom panel reports time trends for our variables across the following three periods which approximate the private equity cycle: 2000 to 2003 (pre credit boom), 2004 to 2007 (credit boom) and 2008 (post credit boom). We test the significance of our time trends with Wilcoxon rank-sum tests. *, **, and *** indicate statistical significance at the 10 percent, 5 percent, and 1 percent levels, respectively.

Panel A: Covenant thresholds

Deal year	Statistics	D/EBITDA			EBITDA/I			CashFlowCoverage		
		t=1	t=2	t=3	t=1	t=2	t=3	t=1	t=2	t=3
2000	Median	3.40	2.80	2.40	2.20	2.40	2.60	1.05	1.05	1.10
	n	1	1	1	1	1	1	1	1	1
2001	Median	4.83	4.30	3.68	2.68	3.00	3.30	1.00	1.00	1.00
	n	2	2	2	2	2	2	1	1	1
2002	Median	4.05	3.40	2.85	3.03	3.50	4.05	1.00	1.00	1.03
	n	6	6	6	6	6	6	6	6	6
2003	Median	3.85	3.20	3.00	4.00	4.00	4.00	1.08	1.10	1.15
	n	5	5	5	7	7	7	6	6	6
2004	Median	5.30	4.55	4.10	2.50	2.90	3.25	1.00	1.00	1.00
	n	20	20	20	19	19	19	18	18	18
2005	Median	4.60	4.25	3.82	2.58	2.68	2.97	1.00	1.00	1.00
	n	25	25	25	20	20	20	26	26	26
2006	Median	4.50	3.90	3.30	2.68	2.85	3.15	1.00	1.00	1.00
	n	31	31	31	20	20	20	31	31	31
2007	Median	5.30	4.40	4.20	2.05	2.26	2.44	1.00	1.00	1.00
	n	28	28	27	22	22	22	29	29	29
2008	Median	4.15	3.38	3.00	2.50	2.70	2.90	1.00	1.00	1.00
	n	8	8	8	7	7	7	8	8	8
Total	**Median**	**4.60**	**4.10**	**3.50**	**2.50**	**2.70**	**2.97**	**1.00**	**1.00**	**1.00**
	Std.	**1.83**	**1.73**	**1.56**	**1.13**	**1.29**	**1.34**	**0.05**	**0.06**	**0.06**
	n	**126**	**126**	**125**	**104**	**104**	**104**	**126**	**126**	**126**
Time trends:										
Pre credit boom (00-03) VS. credit boom (04-07)		(+)**	(+)**	(+)**	(-)***	(-)***	(-)***	(-)***	(-)**	(-)***
Credit boom (04-07) VS. post credit boom (08)		(-)	(-)	(-)	(+)	(+)	(+)	(-)	(-)	(-)

Panel B: Covenant headrooms

Deal year	Statistics	D/EBITDA			EBITDA/I			CashFlowCoverage		
		t=1	t=2	t=3	t=1	t=2	t=3	t=1	t=2	t=3
2000	Median	13.6	18.8	28.0	20.1	27.10	34.50	25.00	9.00	25.00
2001	Median	20.2	22.5	19.2	22.0	21.10	26.55	51.00	34.00	26.00
2002	Median	25.1	27.9	31.4	22.1	20.40	26.80	25.00	27.50	31.50
2003	Median	19.8	22.7	38.2	24.3	38.31	54.67	23.63	27.06	26.62
2004	Median	25.1	26.9	28.0	25.9	26.20	24.40	33.15	29.21	30.50
2005	Median	20.9	25.0	26.9	20.3	20.85	21.25	28.73	29.00	32.77
2006	Median	21.9	24.1	30.0	24.0	25.40	28.15	34.02	31.25	31.25
2007	Median	26.3	28.5	30.1	25.8	26.06	27.31	27.89	34.00	33.48
2008	Median	24.2	26.0	25.8	22.4	25.00	25.20	27.50	27.28	34.19
Total	**Median**	23.3	25.9	29.3	24.0	25.00	26.00	28.73	29.92	32.12
	Std.	**8.35**	**11.37**	**14.44**	**10.76**	**10.62**	**12.42**	**15.83**	**11.66**	**12.48**
	n	**126**	**126**	**125**	**104**	**104**	**104**	**126**	**126**	**126**
Time trends:										
Pre credit boom (00-03) VS. credit boom (04-07)		(+)	(+)	(-)	(+)	(-)	(-)**	(+)	(+)	(+)
Credit boom (04-07) VS. post credit boom (08)		(-)	(-)	(-)	(-)	(-)	(-)	(-)	(-)	(+)

Table IX

EXPLANATORY VARIABLES OF COVENANT RESTRICTIVENESS

The Table presents financial risk and information asymmetry cost proxies. Panel A reports summary statistics and Panel B focuses on the correlations for the information asymmetry costs proxies. D/ EBITDA represents net debt divided by earnings before interest and depreciation at transaction date. D/EV equals net debt debt divided by enterprise value. Private equity group (PEG) size measures the sum of capital committed to the the private equity groups funds over the last five years before the transaction. PEG lifetime represents the age of the private equity organization at transaction date. PEG number counts the number of transactions a PEG was able to complete before the respective deal in our sample. Banking relationship is defined as the value of loans in the previous five years underwritten by the lead arranging bank divided by the total value of all loans sponsored by the respective private equity group as reported in DealScan. *, ** and *** indicate p-values of 10 percent, 5 percent, and 1 percent, respectively.

Panel A: Summary statistics for the financial risk and information asymmetry costs proxies

	Obs.	25%	Median	Mean	75%	SD
Financial risk variables						
D/EBITDA (t=0)	130	3.3	4.3	4.4	5.4	1.5
D/EV (t=0)	130	58.9%	66.3%	65.6%	72.5%	9.6%
Information asymmetry variables						
PEG size (€ millions)	130	91.3	1,316.4	3,033.5	3,936.4	4,961.1
PEG lifetime	130	6.0	13.0	15.6	24.0	12.3
PEG number of deals	130	5.0	11.0	17.4	28.0	17.3
Banking relationship	130	0.0	16.3%	23.2%	34.7%	26.5%

Panel B: Correlation of information asymmetry costs proxies

		Information asymmetry measure		
Information asymmetry measure		(1)	(2)	(3)
(1)	PEG size	1		
(2)	PEG lifetime	0.69 ***	1	
(3)	PEG number of deals	0.62 ***	0.77 ***	1

Table X

REGRESSION RESULTS D/EBITDA HEADROOM

The Table presents the results of ordinary least squares regressions on the determinants of leverage covenant (D/EBITDA) headroom using a sample of 130 PE sponsored LBOs and recapitalizations completed between July 2000 and August 2008. Leverage headroom is the permitted percentage reduction of forecasted EBITDA before breaching the leverage covenant. For each transaction we select the tightest leverage headroom of the first two years following the transaction as the measure of maximal restrictiveness. As proxy for Private Equity group (PEG) reputation we use assets under management, i.e. the aggregated funds raised within the five years prior to the transaction in billions of € as reported by ThomsonVentureEconomics. In case more than one PE sponsor is involved in the transaction, it is resorted to the largest sum of funds raised. Leverage is defined as net debt to EBITDA ratio at transaction. Profitability is measured by return on sales defined as the EBITDA to sales ratio as of transaction year. We use the projected compounded average growth (CAGR) rate of EBITDA from transaction year to the following three years as measure of growth opportunities. Credit risk spread is defined as the difference between of AAA and BB rated corporate bonds, which are obtained from the Merrill Lynch Global Index System. Strict EBITDA definition is a dummy variable assigned a value of one if the underlying EBITDA definition contains less add-backs than the LMA standard contract and zero otherwise. Accordingly, loose EBITDA definition represents deals with more add-backs. Small cap deals are those with a total transaction value (equity plus net debt plus transaction costs) of less than €100m, mid cap deals (the reference category) range from €100m to €500m, and large cap deals exceed €500m. Net debt equals total debt less cash and cash equivalents. The bold numbers in the upper rows represent the regression coefficients. T-statistics are shown in the lower rows. Those in model 1 to 3 are calculated based on heteroskedasticity-consistent standard errors, while those in model 4 are clustered both at the deal year as well as industry (fixed effects) using the method of Thompson (2006) and Petersen (2009). *, ** and *** indicate p-values of 10 percent, 5 percent, and 1 percent, respectively.

VARIABLES	(1)	(2)	(3)	(4)	(5)
PEG Size	0.003***	0.002**	0.002***	0.002***	0.002**
	(3.46)	(2.07)	(3.48)	(2.63)	(2.03)
D/EBITDA	-0.007*		-0.008*	-0.007*	-0.007***
	(-1.91)		(-1.97)	(-1.85)	(-3.42)
D/EV		-0.133*			
		(-1.69)			
Profitability	0.191*	0.180*	0.194*	0.219**	0.219**
	(1.89)	(1.69)	(1.89)	(2.11)	(2.15)
EBITDA Growth (3 yrs)	0.003**	0.002**	0.003**	0.003**	0.003***
	(2.51)	(2.01)	(2.60)	(2.51)	(2.74)
Credit Spread	-0.002	-0.004	-0.003	-0.003	-0.003
	(-0.96)	(-1.42)	(-1.18)	(-1.09)	(-0.95)
Small Cap			-0.004	-0.005	-0.005
			(-0.26)	(-0.32)	(-0.53)
Large Cap			0.005	-0.001	-0.001
			(0.40)	(-0.09)	(-0.09)
Strict EBITDA Definition				-0.019	-0.019*
				(-1.13)	(-1.74)
Loose EBITDA Defnition				0.016	0.016
				(1.05)	(0.78)
Industry Fixed Effects	No	No	No	No	Yes
Time Fixed Effects	No	No	No	No	Yes
Constant	0.204***	0.271***	0.207***	0.202***	0.202***
	(12.51)	(5.38)	(13.34)	(13.02)	(9.74)
Observations	126	116	126	125	125
R-squared	0.17	0.17	0.17	0.19	0.19

t-statistics in parentheses
*** p<0.01, ** p<0.05, * p<0.1

5. Appendix

Appendix I
FREQUENCY OF FINANCIAL COVENANTS (ACQUISITION LOANS BENCHMARK)

The Table presents the inclusion of financial covenants in (1) 130 PE sponsored loan deals, (2) 795 non-sponsored loan deals for the purpose of corporate acquisitions (3) 196 non-sponsored loan deals for the purpose of corporate acquisitions which represent the highest borrower D/EV quartile of the second sample. Following previous research (Chava and Roberts, 2008; Demerjian, 2010), the classification scheme by DealScan and discussions with industry experts, we consider the following set of seven financial covenants in our analysis: (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage), (4) Capex, (5) Net Worth, (6) Debt to Equity (D/E) and (7) Current Ratio covenants. Panel A presents the covenant frequency in the cross-section, while Panel B depicts the covenant frequency over time, i.e. over the following three time periods: 2000 to 2003 (pre-credit boom), 2004 to 2007 (credit boom), and 2008 (post-credit boom). Panel C documents the financial risk of the borrowers. The Wilcoxon tests refer to the differences between the sponsored loan sample and (a) the entire sample of non-sponsored loans and (b) the highest (fourth) D/EV quartile of the non-sponsored sample.

Variables	Unit	Sponsored loans			Non-sponsored loans			Non-sponsored loans			Diff. test (Wilcoxon)	
					All			Highest Leverage Quartile			Sponsored VS	Spons. VS
		Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median	All Non-sponsored	Highest Lev-Quart. Non-spon.
Panel A: Covenant frequency in the cross section												
No. of financial covenants	#	129	3.64	4.00	795	3.64	3.00	196	2.73	3.00	0.00***	0.00***
D/EBITDA	%	129	97%	100%	795	72%	100%	196	62%	100%	0.00***	0.00***
EBITDA/I	%	129	80%	100%	795	46%	0%	196	52%	100%	0.00***	0.00***
Cash flow	%	129	97%	100%	795	51%	100%	196	55%	100%	0.00***	0.00***
Capex	%	129	74%	100%	795	28%	0%	196	30%	0%	0.00***	0.00***
D/E	%	129	0%	0%	795	18%	0%	196	22%	0%	0.00***	0.00***
Current Ratio	%	129	0%	0%	795	8%	0%	196	8%	0%	0.00***	0.00***
Net Worth	%	129	0%	0%	795	28%	0%	196	28%	0%	0.00***	0.00***
Panel B: Covenant frequency over time												
Pre credit boom (00-03)												
No. of financial covenants	#	16	3.94	4.00	312	2.89	3.00	96	2.88	3.00	0.00***	0.00***
D/EBITDA	%	16	88%	100%	312	64%	100%	96	51%	100%	0.06*	0.01**
EBITDA/I	%	16	100%	100%	312	46%	0%	96	57%	100%	0.00***	0.00***
Cash flow	%	16	100%	100%	312	58%	100%	96	63%	100%	0.00***	0.01**
Capex	%	16	69%	100%	312	27%	0%	96	24%	0%	0.00***	0.00***
D/E	%	16	0%	0%	312	27%	0%	96	30%	0%	0.02**	0.01**
Current Ratio	%	16	0%	0%	312	10%	0%	96	5%	0%	0.19	0.35
Net Worth	%	16	13%	0%	312	43%	0%	96	43%	0%	0.02**	0.02**
Credit boom (04-07)												
No. of financial covenants	#	106	3.58	4.00	419	2.48	2.00	70	2.66	3.00	0.00***	0.00***
D/EBITDA	%	106	96%	100%	419	77%	100%	70	71%	100%	0.00***	0.00***
EBITDA/I	%	106	75%	100%	419	46%	0%	70	49%	0%	0.00***	0.00***
Cash flow	%	106	96%	100%	419	47%	0%	70	50%	50%	0.00***	0.00***
Capex	%	106	74%	100%	419	29%	0%	70	39%	0%	0.00***	0.00***
D/E	%	106	0%	0%	419	12%	0%	70	16%	0%	0.00***	0.00***
Current Ratio	%	106	0%	0%	419	6%	0%	70	9%	0%	0.01**	0.00***
Net Worth	%	106	2%	0%	419	18%	0%	70	11%	0%	0.00***	0.01**
Post credit boom (08)												
No. of financial covenants	#	7	4.00	4.00	64	2.45	2.00	30	2.47	2.00	0.00***	0.00***
D/EBITDA	%	7	100%	100%	64	77%	100%	30	73%	100%	0.15	0.13
EBITDA/I	%	7	100%	100%	64	44%	0%	30	43%	0%	0.01**	0.01**
Cash flow	%	7	100%	100%	64	44%	0%	30	43%	0%	0.01**	0.01**
Capex	%	7	100%	100%	64	27%	0%	30	30%	0%	0.00***	0.00***
D/E	%	7	0%	0%	64	13%	0%	30	10%	0%	0.32	0.39
Current Ratio	%	7	0%	0%	64	11%	0%	30	13%	0%	0.36	0.31
Net Worth	%	7	0%	0%	64	19%	0%	30	20%	0%	0.21	0.20
Panel C: Financial risk of borrowers												
D/EV	#	129	0.65	0.66	795	0.32	0.30	196	0.59	0.56	0.00***	0.00***
D/EBITDA	#	129	5.48	5.35	723	3.69	3.14	164	5.74	5.32	0.00***	0.86

Appendix II

THRESHOLDS OF FINANCIAL COVENANTS (ACQUISITION LOANS BENCHMARK)

The Table presents covenant thresholds for our sponsored and non-sponsored samples. We present means and medians for the three main covenants, i.e. the (1) Debt to EBITDA (D/EBITDA), (2) EBITDA to Interest (EBITDA/I), (3) Unlevered Cash Flow to Debt Service (CashFlowCoverage),covenant. Panel A presents thresholds for the cross-section, while Panel B depicts thresholds over time, i.e. over the following three time periods: 2000 to 2003 (pre-credit boom), 2004 to 2007 (credit boom), and 2008 (post-credit boom). Statistics on the financial risk of the borrowers (D/EV and D/EBITDA) are included as well. The Wilcoxon tests refer to the differences between the sponsored loan sample and the highest (fourth) D/EV quartile of the non-sponsored sample.

	Sponsored loans			**Non-sponsored loans**												Wilcoxon rank-sum test*
				All			1. Quartile		2. Quartile		3. Quartile		**4. Quartile**			p value
	Obs.	Mean	Median	Obs.	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Obs.	Mean	Median	
Financials																
D/EV	129	0.65	0.66	1,423	0.37	0.33	0.11	0.11	0.26	0.26	0.42	0.42	355	0.68	0.65	0.30
D/EBITDA	129	5.48	5.35	1,295	3.47	2.87	1.44	1.19	2.98	2.39	4.03	3.64	305	5.64	5.08	0.35
Covenant thresholds																
Panel A: Cross section																
D/EBITDA	123	5.02	4.75	1,015	4.27	4.00	3.39	3.25	4.10	3.75	4.55	4.50	208	5.30	5.00	0.11
EBITDA/I	103	2.78	2.50	649	2.52	2.50	2.98	3.00	2.75	2.75	2.43	2.50	177	2.03	2.00	0.00***
Cash flow	125	1.02	1.00	790	1.34	1.25	1.45	1.25	1.29	1.20	1.35	1.25	185	1.27	1.20	0.00***
Panel B: Time series																
Pre credit boom (00-03)																
D/EBITDA	14	4.04	3.95	384	4.22	4.00	3.03	3.00	4.18	3.50	4.31	4.05	104	5.09	5.00	0.01**
EBITDA/I	16	3.58	3.23	271	2.42	2.25	2.98	3.00	2.78	3.00	2.37	2.45	102	2.01	1.90	0.00***
Cash flow	16	1.05	1.00	381	1.34	1.25	1.44	1.35	1.32	1.25	1.36	1.25	116	1.27	1.15	0.00***
Credit boom (04-07)																
D/EBITDA	102	5.16	4.90	573	4.36	4.00	3.55	3.25	4.08	0.00	4.80	4.60	88	5.74	5.50	0.02**
EBITDA/I	80	2.65	2.33	343	2.57	2.50	2.98	3.00	2.72	2.75	2.44	2.50	65	1.99	2.00	0.00***
Cash flow	102	1.02	1.00	375	1.33	1.25	1.46	1.25	1.27	1.20	1.30	1.25	58	1.23	1.15	0.00***
Post credit boom (08)																
D/EBITDA	7	4.87	4.19	58	3.74	3.50	3.45	3.38	3.68	0.00	3.44	3.50	16	4.29	4.00	0.42
EBITDA/I	7	2.50	2.50	35	2.73	3.00	2.93	3.00	2.77	3.00	2.52	2.75	10	2.52	2.50	0.73
Cash flow	7	1.00	1.00	34	1.51	1.30	1.59	1.35	1.34	1.25	1.74	1.25	11	1.40	1.50	0.00***

* Two-sample Wilcoxon rank-sum (Mann-Whitney) test between entire sponsored loans sample and 4th quartile (highest D/EV) of non-sponsored loans sample.

Appendix III
Borrower and loan characteristics for the sponsored and non-sponsored sample

Variables	Unit	Sponsored loans			Non-sponsored loans			Non-sponsored loans		
					All			Highest Leverage Quartile		
		Obs.	Mean	Median	Obs.	Mean	Median	Obs.	Mean	Median
Size										
Sales	mio. €	129	568.6	276.4	1,420	1686.11	370.47	355	1997.18	423.39
EBITDA	mio. €	129	75.5	34.9	1,359	261.93	58.14	326	267.05	73.76
Financial risk										
D/EV	#	129	0.65	0.66	1,423	0.37	0.33	355	0.68	0.65
D/EBITDA	#	129	5.48	5.35	1,295	3.47	2.87	305	5.64	5.08
Loan Characteristics										
Loan package	mio. €	129	422.9	178.5	1332.0	621.8	171.6	331.0	485.5	141.5
Weighted Spread	basis points	129	267.37	265.12	1,332	192.57	162.50	331	191.77	162.50
Weighted Maturity	months	126	82.3	84.0	783	40.66	36.00	193	39.45	36.00