Balance Sheet Debt Covenants and Seasoned Equity Offerings

Synopsis

The research problem
This study examined the effect of having debt contracts that contain balance sheet covenants on the decision to make seasoned equity offerings (SEOs).

Motivation
Prior studies examined the determinants of equity issuance without considering private debt contracts that contain balance sheet covenants. Generally, firms are not restricted from stock issuance when they have financial debt covenants. This might motivate firms to make SEOs when they are more susceptible to balance sheet debt covenant violations. Making SEOs increases firms' equity capitals in the short term and, therefore, has the direct effect of improving balance sheet covenants in the current period. This effect motivated the current study to examine whether firms are more likely to conduct SEOs when their debt contracts include more-restrictive balance sheet covenants.

The test hypothesis
The hypothesis of the study is in the null form, which states that balance sheet covenant restrictiveness is unrelated to the probability of conducting SEOs.

Target population
The target population includes shareholders, debtholders, and firm managers.

Adopted methodology
Panel data estimation was used, specifically, the fixed effects model.

Analyses
The empirical analysis was conducted on a unique sample of UK listed firms with private debt covenants that is hand-collected from annual reports. Equity issuance in the sample is based on private placements, which are a common type of SEO in the UK. The restrictiveness of balance sheet-based covenants is defined as the number of balance sheet covenants in a loan contract or the tightness of net worth covenant slack.

Findings
The results show that balance sheet covenant restrictiveness is positively associated with the probability of conducting SEOs through private placements. The baseline result is robust to the application of a number of the controls often used in the literature, including cash shortage, the use of balance sheet covenants in the previous loan contract, earnings management, and the quality of external governance. It is also robust to excluding the financial crisis period and addressing potential endogeneity concerns using a propensity score–matching procedure. Additionally, further analysis provides some evidence that equity issuance by firms with more-restrictive balance sheet covenants is negatively associated with future operating performance, suggesting that these firms may not efficiently use the raised capital.

Keywords: Seasoned equity offerings; equity issuance; debt covenants; balance sheet financial covenants.

1. Introduction

Extant studies provide several reasons for why firms conduct seasoned equity offerings (hereafter SEOs). Kim and Weisbach (2008) found that firms make SEOs both to fund investments and to exploit favorable market conditions. DeAngelo et al. (2010) documented that a firm's market-timing opportunities and life cycle stage affect equity issuance, but a near-term need for cash is the primary reason for conducting SEOs. Thus, the findings of prior studies suggest that taking advantage of high valuations, financing investments, and meeting a near-term need for cash affect the probability of conducting SEOs. However, little is known about how having debt contracts with financial covenants influences the decision to make SEOs.

Debt contracts commonly contain financial covenants that often rely on balance sheet or income statement amounts that aim to mitigate agency costs arising from poor decisions by the borrower (Citron, 1992; Demerjian, 2011; Roberts & Sufi, 2009a; Taylor, 2013). Violations of these covenants are costly. Chava and Roberts (2008) and Nini et al. (2009) showed that debt covenant violations lead to a decrease in capital spending. Roberts and Sufi (2009b) found that infringing a debt covenant accelerates the loan repayment schedule, increases interest costs, and decreases the availability of credit. Furthermore, Nini et al. (2012) documented that debt covenant violations increase the probability of forced CEO turnover. Therefore, these findings suggest that firms have an incentive to avoid costly debt covenant violations. The aim of this study was to examine whether this incentive motivates firms to conduct SEOs.

Providing evidence on how financial debt covenants affect equity issuance is important for several reasons. First, firms are not generally restricted from stock issuance when they have financial debt covenants. For example, Hong et al. (2016) examined the use of debt contracts around the word and showed that only about 13% of the debt contracts included a covenant related

to stock issuance restrictions.[1] Given this, it is interesting to investigate whether firms consider issuing equity to avoid costly covenant violations. Second, previous studies provided evidence that managers meet financial debt covenants by managing earnings (e.g., Ahmed et al., 2008; Fan et al., 2019; Franz et al., 2014), while capital contributions from shareholders have not been studied. It might be less costly for managers to avoid costly covenant violations by making equity offerings rather than engaging in earnings management. This is because managers' earnings management practices might be detected, which, in turn, is likely to have a negative effect on their current and future job prospects and reputation. Therefore, this study may benefit debt providers and investors by alerting them to the possibility of making an equity issuance to remain within covenant restrictions. The results of this study might underline whether there is a need for the use of a covenant related to stock issuance restrictions alongside financial covenants in debt contracts.

Firms making SEOs achieve an increase in their equity capitals in the short term. This process is likely to have the direct effect of improving balance sheet covenants. The reason for this is that balance sheet covenants require a minimum level of equity in the borrower's capital structure (Callen et al., 2016; Christensen & Nikolaev, 2012). Hence, firms with more-restrictive balance sheet covenants may have an incentive to issue SEOs to become less susceptible to debt covenant violations. However, equity issuance is not likely to have the direct benefit of improving income statement covenants. This is because these covenants rely on firms' current-period operating performance (Callen et al., 2016; Christensen & Nikolaev, 2012), which is unlikely to be improved via equity issuance. The latter may improve firms' future-period operating performance, and this depends on how efficiently the raised capital is used (Papadaki & Pavlopoulou-Lelaki, 2021).

[1] Consistent with this finding, in our study's sample, only two firms out of 252 were found to have the covenant related to stock-issuance restrictions.

Consequently, the current study predicted that firms are more likely to conduct SEOs when their debt contracts include more-restrictive balance sheet covenants.

An alternative view, however, is that firms with restrictive balance sheet covenants might be reluctant to make SEOs. This is because equity issuance itself is costly, with direct costs such as underwriter fees, listing fees, legal fees, and accounting expenses. Issuers are also likely to incur underpricing costs associated with selling a stock at a discount, which dilutes the positions of current shareholders (Armitage et al., 2014). Furthermore, the information-signaling hypothesis states that equity issuance is negatively associated with common stock returns. Unlike shareholders, debtholders may positively react to SEO announcements (Elliott et al., 2009). Therefore, the wealth transfer hypothesis argues that equity issuance leads to a wealth transfer from shareholders to debtholders (Elliott et al., 2009; Kalay & Shimrat, 1987). As a result, these costs may discourage firms from making SEOs when they have restrictive balance sheet covenants. As such, the effect of balance sheet covenant restrictiveness on the probability of conducting SEOs is an open empirical question.

The current study examines this research question in the context of the UK, where private placements are a common type of SEO (Armitage et al., 2014; Barnes & Walker, 2006). Private placements have low proprietary costs and allow firms to raise capital quickly (Melia et al., 2018), which may help firms to improve their balance sheet amounts within a short period of time. Thus, the UK setting offers scope for examining whether firms issue equity when they have restrictive balance sheet-based covenants. Furthermore, the UK has a creditor-friendly bankruptcy code; banks in the UK have rights to place firms that violate their debt covenants directly into receivership and liquidate their assets (Acharya et al., 2011; Daniels & Ramirez, 2007). This

implies that firms in the UK have strong incentives to avoid infringing debt covenants, offering scope for investigating whether they achieve this by conducting SEOs.

The empirical analysis of the current study was conducted on a unique sample of UK listed firms with private debt covenants, which was hand-collected from annual reports. The Thomson One database was used to identify SEO firms in the sample. As private placements are a common type of SEO in the UK, all equity issues in the sample are based on private placements. Two proxies were used for the restrictiveness of balance sheet-based covenants, in the spirit of prior studies (e.g., Abu Bakar et al., 2020; Callen et al., 2016). The first proxy is based on the number of balance sheet covenants in a loan contract. The second proxy is based on the tightness of net worth covenant slack. The net worth covenant for a loan is classified as tight if its slack is below the sample median of the loans with net worth covenants.

Using a logit regression, the results indicate that balance sheet covenant restrictiveness is positively associated with the probability of conducting SEOs. This suggests that firms are more likely to issue equity, through private placements, when they become more susceptible to balance sheet-related covenant violations. The baseline result is robust to the application of a number of controls often used in the literature, including cash shortage (i.e., free cash flows, current ratio), the use of balance sheet covenants in the previous loan contract, real/accruals earnings management, and the quality of external governance (i.e., institutional shareholders, auditor quality). It is also robust to excluding the financial crisis period and addressing potential endogeneity concerns using a propensity score–matching procedure. Additionally, the further analysis provided some evidence that equity issuance by firms with more-restrictive balance sheet covenants is negatively associated with future operating performance, suggesting that these firms may not use the raised capital efficiently.

This study contributes to at least two important streams of literature. First, it extends the equity issuance literature by providing evidence that the decision to make SEOs via private placements is influenced by not only substantial investment opportunities or a near-term need for cash (e.g., DeAngelo et al., 2010; Kim & Weisbach, 2008) but also debt contracts that contain restrictive balance sheet covenants. The results suggest that having more-restrictive debt covenants measured with balance sheet amounts appears to be one important determinant of equity issuance. Second, it extends the debt covenant literature that examines whether firms engage in activities to reduce the likelihood of debt covenant violations. Extant studies in this literature generally focused on accounting choices and showed that firms employ different earnings management methods to avoid covenant violations (e.g., Fan et al., 2019; Franz et al., 2014; Roychowdhury, 2006). Different from these studies, the current study focused on equity issuance and provided evidence that firms make SEOs via private placements to remain within balance sheet-based covenant limits. Therefore, the results of this study suggest that firms meet debt covenants, particularly balance sheet covenants, not only through accounting choices but also via capital contributions from shareholders.

This paper proceeds as follows: Section 2 develops the main hypothesis. Section 3 describes the research design and the data. Section 4 reports the empirical results. Section 5 summarizes and concludes.

2. Related Literature and Hypothesis Development

Several studies have examined the potential determinants of equity issuance. Earlier studies investigated whether the market timing hypothesis provides explanations for SEOs (e.g., Hovakimian et al., 2001; Pagano et al., 1998; Taggart, 1977). They found that firms that make equity issuances typically have high share valuations. This implies that managers time market

conditions and make SEOs when their stock prices are high, in line with the market-timing hypothesis. Kim and Weisbach (2008) examined whether firms conducted SEOs to raise funds for capital investment purposes. They documented increases in investments, such as R&D and capital expenditures, following SEOs, implying that raising funds for investments is one of the potential determinants of equity issuance.[2] Similarly, Walker and Yost (2008) showed that most SEO firms' investments increased right after the equity offerings, suggesting that SEOs are conducted for capital investment purposes. DeAngelo et al. (2010) extended the equity issuance research by documenting that not only market-timing opportunities but also a near-term need for cash and the stage of corporate life cycle affect the probability of conducting SEOs. Their results showed that meeting a near-term need for cash is the primary reason for issuing equity, with life cycle stage and market-timing motives exerting only ancillary effects.

Different from these studies, the aim of the current study was to examine how debt contracts with more-restrictive financial covenants influence the decision to make SEOs. Existing studies show that debt contracts often include financial covenants (Chan & Hsu, 2013; Christensen et al., 2009; Demerjian, 2011; Moir & Sudarsanam, 2007; Rhodes, 2016; Roberts & Sufi, 2009a; Taylor, 2013). For example, Roberts and Sufi (2009a) found that 96% of their sample debt contracts have at least one financial covenant. These covenants were measured using balance sheet and income statement amounts, aiming to mitigate managerial actions that are detrimental to the lenders (Christensen & Nikolaev, 2012; Demerjian, 2007, 2011; Rhodes, 2016; Shivakumar, 2013). Balance sheet-based debt covenants give information about the sources and uses of capital, and they require firms to maintain sufficient equity capital. This makes equity capital sensitive to

[2] Their results also provided some support to the market-timing hypothesis. Specifically, the authors found that when firms with high share valuations conduct SEOs, the purpose of these offerings is to exploit favorable market conditions, whereas firms with low share valuations are likely to issue equity to fund investments.

opportunistic actions and, therefore, decreases managers' incentives to expropriate lenders' wealth (Christensen & Nikolaev, 2012; Demerjian, 2011). Income statement-based covenants give information about current-period operating performance, which helps lenders determine whether the borrower will have sufficient cash flows to service the debt (Demerjian, 2011; Rhodes, 2016).

Extant studies showed that debt covenant violations are costly. Chava and Roberts (2008) found that a firm's capital spending decreases significantly subsequent to debt covenant violations. Similar results were documented by Nini et al. (2009), who showed that after a covenant violation, lenders impose new covenants related to restricting capital spending, which leads to a sharp reduction in investment. Roberts and Sufi (2009b) showed that subsequent to debt covenant violations, banks accelerate the loan repayment schedule, increase interest costs, and restrict the availability of credit. Nini et al. (2012) found that the probability of forced CEO turnover increases following a breach of debt covenants. Finally, while Chava et al. (2015) documented that infringing debt covenants leads to a decline in corporate innovation, Bhaskar et al. (2017) showed that audit fees and the probability of receiving a going concern opinion increase after technical default.

Therefore, these costly actions provide incentives for firms to reduce the probability of debt covenant violations (Dichev & Skinner, 2002; Watts & Zimmerman, 1986). Extant studies showed that borrowers achieve this by making income-increasing accounting choices. DeFond and Jiambalvo (1994) and Sweeney (1994) documented that firms employ accruals earnings management to remain within covenant limits. Kim et al. (2010) and Franz et al. (2014) found that firms employ real earnings management to avoid infringing debt covenants. However, unlike these two studies that focused on balance sheet covenants, Fan et al. (2019) employed income statement covenants and examined whether the existence of these covenants affects the use of classification shifting. The latter is a form of earnings management that inflates core earnings but does not alter

net income (compared to real/accruals earnings management) and, thus, helps firms to only improve their income statement covenants. The results of Fan et al. (2019) showed that firms are likely to engage in classification shifting when they have income statement covenants.

This study argues that firms can also make SEOs to reduce the probability of costly debt covenant violations. On the one hand, it is possible to predict that SEOs are more likely to be made by firms with more-restrictive balance sheet-related covenants that require a minimum level of equity in the borrower's capital structure (Callen et al., 2016; Christensen & Nikolaev, 2012; Shivakumar, 2013). Firms with more-restrictive balance sheet covenants are more susceptible to covenant violations. As such, conducting SEOs can help them to increase their equity capitals in the short term, which is likely to have the direct effect of improving balance sheet covenants. By contrast, equity issuance is not likely to have the direct benefit of improving income statement covenants. The reason for this is that such covenants rely on firms' current-period operating performance (Callen et al., 2016; Christensen & Nikolaev, 2012; Shivakumar, 2013), which is unlikely to be improved via equity issuance. The latter may improve firms' future-period operating performance, and this depends on how efficiently the raised capital is used (Papadaki & Pavlopoulou-Lelaki, 2021). These lines of arguments lead to the expectation that firms are more likely to issue equity when they have debt contracts that include more-restrictive balance sheet-related covenants.

On the other hand, firms may be reluctant to make SEOs when they have restrictive balance sheet-related covenants. This is because equity issuance itself is costly. The issuer usually incurs a variety of direct and indirect costs when making SEOs. The direct costs include expenses, such as underwriter fees, listing fees, legal fees, and accounting expenses. These costs tend to be relatively large. For example, Autore et al. (2019) showed that the average of the gross dollar fee paid to the

SEO underwriters is about 4.5% of the total offer proceeds for the issuers in their sample. Underwriter fees vary depending on various factors, including the size of the issue, the reputation of the underwriter, and the quality of financial reporting (e.g., Autore et al., 2019; Butler et al., 2005).

Equity issuance also involves indirect costs related to negative stock price reactions to offering announcements (Elliott et al., 2009; Kalay & Shimrat, 1987). The SEO literature often relies on the information-signaling hypothesis to explain this negative reaction. Under this hypothesis, firms make SEOs when they are overvalued. Alternatively, SEOs are indicative of unexpectedly low current cash flows, which sends a negative signal to the stock market in terms of the firm's future expected cash flows. Unlike shareholders, debtholders may positively react to SEO announcements, because equity issuance decreases the borrower's leverage ratio, thereby making the debt less risky (Elliott et al., 2009). This implies that debtholders gain at the expense of the shareholders. Therefore, the wealth transfer hypothesis states that equity issuance leads to a wealth transfer from shareholders to debtholders (Elliott et al., 2009; Kalay & Shimrat, 1987). This is likely to be the case when debt market and stock market reactions to the equity issuance are inversely related.

Furthermore, issuers are likely to incur underpricing costs associated with selling a stock at a discount. Prior studies reported several factors that explain why underwriters set the offer price at a considerable discount from the current market value. For example, Armitage et al. (2014) showed that inelastic demand, or illiquidity, is a primary determinant of SEO underpricing. Selling new shares to investors at a discount dilutes the positions of current shareholders, leading to a

wealth transfer from them to the new shareholders.[3] Consequently, the aforementioned arguments suggest that equity issuance is costly to issuing firms. This may discourage firms from making SEOs when they have restrictive balance sheet covenants. As such, firms with restrictive balance sheet-related covenants may be reluctant to conduct SEOs.

Given that both covenant violations and equity issuance are costly, firms are likely to decide whether to conduct SEOs by comparing these two costs. For example, equity issuance might be less costly than covenant violations if firms make SEOs through private placements. Unlike the other methods of raising equity, private placements tend to generate significantly positive share price effects (e.g., Slovin et al., 2000). Therefore, shareholders may prefer their firms to make private placements to avoid covenant violations. This is because shareholders might be worse off if their firms violate covenants. Dyreng et al. (2022) provided evidence that shareholders are better off when their firms engage in costly activities, such as earnings management, to avoid covenant violations. This suggests that shareholders may find covenant violations more costly than the activities that their firms can use to remain within covenant limits.

In addition, this method of raising equity enables firms to raise money privately without publicly soliciting investors. It has a shorter issue timetable and can be used to raise a smaller amount of capital (Slovin et al., 2000; Xu et al., 2017). This is likely to help firms to provide a buffer for balance sheet debt covenants within a short period of time. Collectively, these arguments indicate that firms that are more susceptible to covenant violations might be more motivated to conduct SEOs via private placements. In support of this prediction, our study found that the average distance between the actual value and the threshold value is 16.7% of the threshold for the sample

[3] Ownership dilution can be relatively large. For example, Glegg et al. (2012) reported that the mean equity issuance discount was about 9% in their sample, which is equivalent to a wealth dilution to existing shareholders of USD 69 million.

firms with restrictive net worth balance sheet covenants, and the average of the amount of capital that these firms raise via private placements is 25.3% of the threshold value of the net worth covenant. These two ratios are close, suggesting that firms may make private placements to obtain the amount of the capital that they need to increase the probability of avoiding balance sheet covenant violations.

In summary, the above discussion suggests that equity issuance is beneficial for firms in terms of avoiding balance sheet covenant violations. At the same time, it suggests that this activity is costly. As such, it is not clear ex ante whether firms are more likely to conduct SEOs when they have more-restrictive balance sheet covenants. Therefore, the hypothesis of the study is stated in the null form:

Hypothesis: Balance sheet covenant restrictiveness is unrelated to the probability of conducting SEOs.

3. Sample and Research Methodology

3.1. *Sample selection*

Debt covenant data are hand-collected from annual reports of all non-financial UK public firms for the 2005–2017 time period. The sample selection started with all UK listed firms in Compustat Global because this database is used to obtain accounting data which are needed to test the hypothesis. Financial firms are not included as they operate in a different regulatory environment. Company annual reports are used to analyze covenant choice in private lending agreements. Appendix A shows examples of extracts from company annual reports in relation to information about covenant data. It is required each firm-year to have the loan covenant information needed to determine whether the firm has a balance sheet-based covenant in a given year. Table 1, Panel A, provides the results of the sample selection procedure. The final sample consisted of 1,191 firm-

year observations, covering 252 firms. Of this total, 190 firm-year observations had at least one balance sheet-based covenant, while all the remaining firm-year observations had only income statement-based covenants. The Thomson One database was used to analyze firms that conducted SEOs in the sample. Consequently, it was found that 136 SEOs were made by the sample firms. These equity issues were conducted through private placements, a common type of SEO in the UK (Armitage et al., 2014; Barnes & Walker, 2006).

[Table 1 around here]

When checking the company annual reports for covenant data, covenants related to net worth requirement, tangible net worth requirement, current/quick ratio, debt-to-equity ratio, debt-to–tangible net worth ratio, and loan-to-value ratio were regarded as balance sheet covenants.[4] Table 1, Panel B, shows the distribution of these balance sheet covenants in the sample. It appears that net worth, debt-to-equity (leverage) ratio, and tangible net worth covenants are the more commonly used balance sheet covenants, with 8.5%, 5%, and 4.3% of loans containing these covenants, respectively. Current/quick ratio covenants are rarely used, as less than 1% of loans include these covenants. These results are largely consistent with prior studies, which showed that net worth and debt-to-equity (leverage) ratio covenants are the more commonly employed balance sheet covenants than the current and quick-ratio covenants (e.g., Demerjian, 2011; Rhodes, 2016).

3.2. *Balance sheet covenant restrictiveness*

In the spirit of prior studies (e.g., Abu Bakar et al., 2020; Callen et al., 2016), the restrictiveness of balance sheet-based covenants was measured as the natural logarithm of the number of balance sheet covenants in a loan contract (*Num_BS_Cov*). The advantage of this measure is that it does

[4] This classification is in line with prior studies (e.g., Christensen & Nikolaev, 2012; Demerjian, 2011; Rhodes, 2016).

not require the actual value of the covenant to be calculated, unlike other measures of covenant restrictiveness, such as tightness of the covenant slack. The calculation of the covenant's actual value is subject to measurement error (e.g., Dichev & Skinner, 2002; Rhodes, 2016). The reason for this is that the same covenant might have various definitions in different loan contracts. When firms in their annual reports disclose that they are subject to debt covenants, they often do not specify how lenders define the actual values of these covenants. Therefore, for example, when the firm specifies that it has the debt-to-equity covenant, it becomes difficult to understand whether debt in this covenant is defined as total debt, funded debt, or funded debt less cash (Dichev & Skinner, 2002).

Nevertheless, tight covenant slack (*Tight_BS_Cov*) was also used as a measure of covenant restrictiveness to increase the validity of the results. To mitigate the aforementioned measurement error in relation to the calculation of this proxy, following prior studies, the tightness of covenant slack was calculated for the net worth balance sheet-based covenant, because it has a relatively more standard definition and, thus, less measurement error (Dichev & Skinner, 2002; Kim, 2020; Rhodes, 2016). The slack for the net worth covenant was calculated as the difference between the actual value of the net worth covenant and the threshold value of the net worth covenant divided by the threshold value of the net worth covenant. A net worth covenant for a loan is classified as tight if its slack is below the sample median of the loans with net worth covenants.[5] Therefore, the variable *Tight_BS_Cov* was defined as an indicator variable equal to 1 for firms with tight net worth covenant slack, 0 otherwise.

[5] The use of an indicator variable to define the tightness of the covenant slack is common in the private debt-contracting literature (e.g., Fan et al., 2019; Franz et al., 2014; Rhodes, 2016). For example, Rhodes (2016) used a sample median in defining firms with tight covenant slack.

3.3. *Research methodology*

To examine whether and how the restrictiveness of balance sheet-based debt covenants affects the likelihood of conducting SEOs, the following model was estimated:

$$Prob(EQ\_ISSUE_{i,t+1}=1) = \alpha_0 + \alpha_1 Rest\_BS\_Cov_{i,t} + \alpha_2 Cash_{i,t} + \alpha_3 BTM_{i,t} + \alpha_4 Leverage_{i,t} + \alpha_5 Age_{i,t} + \alpha_6 ACQ_{i,t} + \alpha_7 Dividends_{i,t} + \alpha_8 F\_Constraint_{i,t} + \alpha_9 Size_{i,t} + \alpha_{10} ROA_{i,t} + \alpha_{11} Loss_{i,t} + \alpha_{12} R\&D_{i,t} + \alpha_{13} Tangible_{i,t} + \alpha_{14} Default_{i,t} + \alpha_{15} Maturity_{i,t} + \alpha_{16} Revolver_{i,t} + \alpha_{17} Secured_{i,t} + \varepsilon_{i,t}, \quad (1)$$

where *EQ_ISSUE* is equal to 1 if the firm made an SEO in year $t + 1$ and 0 if it did not. The variable of interest is *Rest_BS_Cov*, which is one of the two balance sheet covenant restrictiveness measures in year t (*Num_BS_Cov* and *Tight_BS_Cov*), as defined above. The dependent variable is measured in year $t + 1$, as initiating and processing an SEO takes a significant amount of time. This also helps to ensure that balance sheet covenant restrictiveness has a causal effect on the probability of conducting SEOs. If firms with more-restrictive balance sheet covenants are more likely to make SEOs, it is expected that the coefficient on *Rest_BS_Cov* will be positive.

The model includes several control variables shown in extant studies to affect the probability of conducting SEOs. DeAngelo et al. (2010) found that a near-term need for cash is one determinant of equity issuance. To control for this, following DeAngelo et al. (2010), the model included cash-to-total-assets ratio (*Cash*). The results of Kim and Weisbach (2008) and Walker and Yost (2008) suggested that firms make SEOs when they have high investment opportunities. Thus, book-to-market ratio (*BTM*), measured as the book value of equity divided by the market value of equity, was added as a proxy for growth opportunities. Capital structure is likely to have an effect on the probability of conducting SEOs. This was controlled for by adding a leverage ratio (*Leverage*), defined as the sum of long-term debt and short-term debt (debt in current liabilities), divided by the market value of total assets. Furthermore, DeAngelo et al. (2010) found that the

corporate life cycle stage affects the probability of making SEOs; thus, firm age (*Age*) was added as a proxy for a firm's life cycle stage. The possibility of making SEOs to finance M&A activity was also controlled for by adding an indicator variable for firms that planned to engage in acquisitions (*ACQ*).

In addition, controls were included for a number of firm and loan characteristics that might affect the restrictiveness of balance sheet covenants in loan contracts, following Christensen and Nikolaev (2012), Demerjian (2017), and Paik et al. (2019).[6] The financial-constraint index developed by Whited and Wu (2006) (*F_Constraint*)[7] and the ratio of common dividends to the market value of equity (*Dividends*) were added to control for financial constraints. Return on assets (*ROA*), an indicator variable for firms with negative net income (*Loss*), and R&D expenses as a percentage of total revenue (*R&D*) were included to control for performance and R&D intensity. Other control variables were added to capture firm size (*Size*), measured as the natural logarithm of the market value of total assets; asset tangibility (*Tangible*); and frequency of default risk (*Default*), defined as an indicator variable equal to 1 for firms that have a Taffler (1983) Z-score[8] less than the sample median, 0 otherwise.

Furthermore, the number of months to maturity (*Maturity*), an indicator variable for loan contracts with a revolving facility (*Revolver*), and an indicator variable for loan contracts where debt is secured (*Secured*) were included to control for the possible impacts of loan characteristics. Finally, industry and year fixed effects were added to control for industry and timing effects,

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[6] The controls used in the baseline model are also largely in line with the ones used by other debt-contracting-based papers (e.g., Saavedra, 2018; Wang, 2017).

[7] Following Christensen and Nikolaev (2012), this variable was measured by sorting firms into terciles based on their Whited and Wu (2006) index, taking the values of 1 to 3.

[8] Taffler's (1983) Z-score is used in the literature to measure UK firms' expected default risk (e.g., Moir & Sudarsanam, 2007). Lower values of this Z-score imply a higher probability of default.

respectively. The model was estimated using a logit regression. Robust standard errors clustered by firm were used to obtain *z*-statistics (Petersen, 2009).

4. Empirical Results

4.1. *Descriptive statistics and correlation analysis*

Table 2, Panels A and B, present descriptive statistics for the overall sample and the subsamples of firms with at least one balance sheet-based covenant and those with only income statement-based covenant(s), respectively. Panel A shows that, on average, 11% of the sample firms made SEOs in a year (*EQ_ISSUE*). About 16% of loan contracts in the sample have at least one balance sheet-based debt covenant (*BS_Cov*).[9] The average *Cash* is 0.074, and the mean *BTM* is 0.955. The sample has a mean *Leverage* of 0.186, and firms in the sample have been in operation for an average of 17.4 years (*Age*). About 79% of loan contracts include a revolving facility (*Revolver*), and 43% of loans in the sample have a collateral requirement (*Secured*).

[Table 2 around here]

Panel B shows that a significantly higher percentage of firms with at least one balance sheet-based covenant make SEOs than firms with only income statement-based covenants (16.8% and 10.4%, respectively). Firms in the balance sheet-based covenant sample, on average, have significantly higher *Cash* but significantly lower *ROA* relative to firms in the income statement-based covenant sample. Furthermore, the means of *Age* and *Size* are significantly lower for firms in the balance sheet-based covenant sample compared to firms in the income statement-based covenant sample. Finally, firms with balance sheet-based covenants have significantly fewer loans

[9] A further analysis found that the use of balance sheet covenants in loan contracts declined over the sample period, in line with Demerjian (2011). For example, balance sheet covenants were included in 30% of loan contracts in 2005, while this figure was only 11% in 2015.

with a revolving facility (*Revolver*) but significantly more loans with collateral requirement (*Secured*) than their counterparts with only income statement-based covenants.

[Table 3 around here]

Table 3 provides correlations between the key variables. The correlation between *EQ_ISSUE* and *Num_BS_Cov* (*Tight_BS_Cov*) is positive and significant, indicating that the restrictiveness of balance sheet-based financial covenants in loan contracts is associated with the likelihood of making SEOs. *EQ_ISSUE* is negatively correlated with *Age*, *Dividends*, *Size*, and *ROA* and positively correlated with *Leverage*, *F_Constraint*, *Loss* firms, and loan contracts that have a collateral requirement (*Secured*). Other high and significant correlations include those between firm size and financial constraints, and between return on assets and frequency of losses, consistent with the corresponding correlations reported in prior research (e.g., Christensen & Nikolaev, 2012).

4.2. *Balance sheet covenant restrictiveness and SEOs*

Table 4 shows the results of estimating the baseline logit model (1). Column (1) reports the results when estimating the model by replacing the balance sheet covenant restrictiveness variable (*Rest_BS_Cov*) with an indicator variable for firms with at least one balance sheet-based covenant (*BS_Cov*) to test whether these borrowers, on average, are likely to make SEOs. The estimated coefficient on *BS_Cov* is positive and significant, providing preliminary evidence that equity issuance is likely to be affected by the use of balance sheet versus income statement covenants in a loan contract.

Column (2) reports the results of estimating the model with the covenant restrictiveness measure of number of balance sheet covenants in a loan contract (*Num_BS_Cov*). The estimated coefficient on *Num_BS_Cov* is positive and significant, indicating that firms are more likely to

conduct SEOs when the number of balance sheet covenants in their loan contracts increases. Column (3) reports the results when estimating the model with the covenant restrictiveness measure of tightness of balance sheet covenant slack (*Tight_BS_Cov*). The estimated coefficient on *Tight_BS_Cov* is positive and significant, implying that firms are more likely to conduct SEOs when they have tight balance sheet covenant slack. Overall, the results suggest that firms with more-restrictive balance sheet-based covenants are more motivated to issue SEOs with the aim of improving their balance sheet amounts.[10]

With regard to the control variables, cash to total assets ratio (*Cash*), book to market ratio (*BTM*), firm age (*Age*), and firm performance (*ROA*) are negatively and significantly related to the likelihood of equity issuance, showing that firms that have more need for cash, firms with more growth opportunities, younger firms, and less profitable firms are more likely to conduct SEOs. By contrast, leverage ratio (*Leverage*) and M&A activity (*ACQ*) are positively and significantly associated with the probability of making SEOs, implying that more leveraged firms and firms planning to engage in acquisitions are more likely to make an equity issuance. The behavior of these variables is in line with prior research (e.g., DeAngelo et al., 2010; Kim & Weisbach, 2008).

[Table 4 around here]

4.3. *Endogeneity problems*

In the baseline model (1), the dependent variable, the likelihood of making SEOs, was measured in year $t + 1$ when the independent variable of interest was taken as of year t. Furthermore, in accordance with previous studies, several control variables were included in this model. However,

[10] The results are also economically significant. For example, the coefficient estimate in Column (2) of Table 4 suggests that a one-standard-deviation increase in the restrictiveness of balance sheet covenants increases the probability of conducting SEOs by 20 percentage points (0.283*0.721).

the findings might still be subject to endogeneity concerns.[11] For example, there might exist potential reverse causality concerns if firms make SEOs in anticipation of securing a loan contract that contains balance sheet-based covenants. Alternatively, there might exist some omitted correlated variables that affect the use of balance sheet versus income statement covenants in a loan contract. To mitigate these potential endogeneity issues, a number of additional analyses were implemented as described in the following sections.

4.3.1. *Additional controls*

We tested whether the main results change when additional controls that may affect the use of covenant type in a loan contract or equity issuance are included in the baseline model. First, it is checked whether the main finding, even after controlling for cash to total assets (*Cash*) and book to market (*BTM*) ratios in the baseline model, is driven by the need for cash. This is likely to be the case if the need for cash affects both balance sheet covenant restrictiveness and the decision to issue equity. To better control for cash shortage, we added several additional variables to the baseline model related to operating cash flows scaled by total assets (*CFO*), current ratio (*Current*), and sales growth (*Sales_GR*). In Table 5, Columns (1) and (2) indicate that the estimated coefficients on *Num_BS_Cov* and *Tight_BS_Cov* remained positive and significant after controlling for the impact of the need for cash.

[Table 5 around here]

[11] In addition, the results reported in our study could be questioned given the possibility that firms close to violation or in technical default of their debt covenants use debt contract renegotiation. This option, however, might not be viable for firms with balance sheet covenants—Nikolaev (2018) provided some evidence that, unlike income statement covenants, balance sheet covenants are not associated with debt contract renegotiation. Furthermore, even if debt renegotiation was a viable option for borrowers with restrictive balance sheet covenants, it would bias the current study against finding a significant association between balance sheet covenant restrictiveness and the probability of conducting SEOs.

Second, we checked whether the effect of balance sheet covenant restrictiveness on the likelihood of equity issuance changes if the baseline model controls for external governance factors related to institutional ownership (*INST_OWN*) and auditor quality, proxied by auditor industry expertise (*AU_EXP*).[12] *INST_OWN* is defined as the number of shares held by institutional investors divided by the total number of outstanding shares (Anagnostopoulou & Malikov, 2023). *AU_EXP* is an indicator variable equal to 1 if the client's audit firm audits at least 20% of sales in the client's industry, 0 otherwise (Robin et al., 2017). In Table 5, Columns (3) and (4) show that the estimated coefficients on *Num_BS_Cov* and *Tight_BS_Cov* remained positive and significant after controlling for the impact of institutional ownership and auditor quality.

Third, we checked whether the effect of balance sheet covenant restrictiveness on the likelihood of equity issuance changes if the baseline model controls for real (*REM*) and accruals (*AEM*) earnings management. *REM* was measured as the sum of three individual measures (abnormal levels of discretionary expenses, production costs, and cash flows from operations) of real earnings management, following the models developed by Roychowdhury (2006). *AEM* was measured using the modified Jones model (Dechow et al., 1995), with lagged return on assets as a control for extreme operating performance (Kothari et al., 2005). In Table 5, Columns (5) and (6) indicate that the estimated coefficients on *Num_BS_Cov* and *Tight_BS_Cov* remained positive and significant after controlling for the impact of real and accruals earnings management.

Finally, we checked whether the main finding of balance sheet covenant restrictiveness in a current deal is positively associated with the likelihood of equity issuance changes if an additional control relating to a number of balance sheet covenants used in the previous loan contract

[12] The results did not change when *Big N* was used as a proxy for auditor quality (Robin et al., 2017).

(*PrevNum_BS_Cov*) is added to the baseline model. The inclusion of this control is important, as Demerjian (2011) shows that the use of the type of financial covenant in a loan contract is persistent. Table 5, Column (7), indicates that the estimated coefficient on *Num_BS_Cov* remained positive and significant after controlling for the impact of the number of balance sheet covenants used in the previous loan contract.

4.3.2. *Two-period lag*

To deal with potential reverse causality concerns, the dependent carriable (*EQ_ISSUE*) was measured in year $t + 2$ instead of year $t + 1$. In Table 6, Columns (1) and (2) show that the estimated coefficients on *Num_BS_Cov* and *Tight_BS_Cov* are positive and significant. These results are consistent with the main findings that firms with more-restrictive balance sheet-based covenants are more likely to conduct SEOs.

[Table 6 around here]

4.3.3. *Homogenous sample*

The study sample spans the financial crisis period from 2008 to 2010. During this period, the values of firms' assets may have decreased and, therefore, they may have had stronger incentives to make SEOs to become less susceptible to balance sheet-related debt covenant violations. Thus, the results could be driven by the financial crisis. This issue was addressed by investigating whether the primary results are robust to the exclusion of the financial crisis period. The results are given in Table 6, Columns (3) and (4), which indicate that the estimated coefficients on *Num_BS_Cov* and *Tight_BS_Cov* are positive and significant. This implies that balance sheet covenant restrictiveness has a positive effect on the likelihood of equity issuance, demonstrating that the main inferences remain intact.

4.3.4. *Propensity score matching*

Propensity score—which is the conditional probability of receiving the treatment (having a balance sheet-related covenant) given a borrower's pretreatment characteristics—was measured for all borrowers with debt covenants by estimating a probit regression for the probability of borrowers having a balance sheet-based covenant rather than an income statement-based covenant. The probit regression was estimated based on firm and debt characteristics from Christensen and Nikolaev (2012), which were used as controls in the baseline model. In addition, this probit model included an indicator for a deal contract where the purpose of the loan is to fund operating or financing activities (*Loan_Purpose*), an indicator for use of a performance pricing provision (*Perf_Pricing*), and the cross-sectional standard deviation of quarterly profit growth by industry as a proxy for uncertainty (*Uncertainty*). These variables were added because extant research documents that uncertainty (Demerjian, 2017) and the purpose of a loan (Paik et al., 2019) affect the type of financial covenant used in loan contracts. Each observation in the treated group was matched with one in the control group that has the closest propensity score within the maximum caliper distance of 0.01, and all firm-year observations that do not satisfy the common support condition were excluded. This generated 155 pairs of matched firms.

[Table 7 around here]

Table 7 shows the summary statistics of the propensity score–matching procedures. Column (1) of Panel A indicates the results for the probit model employed to measure propensity scores. Column (2) of Panel A presents the results for the main analysis using the propensity matched sample. The estimated coefficient on *BS_Cov* is positive and significant, suggesting that the effect of balance sheet covenants on the likelihood of making SEOs still exists after using the propensity score–matching strategy to attempt to deal with the endogeneity concerns discussed

above. Panel B of Table 7 indicates that the sample means of the variables used in the propensity score–matching model for the treatment and matched firms are insignificantly different. This suggests that the matching procedure successfully eliminated all observable differences.

4.3.5. *Instrumental variable approach*

The potential endogeneity issues were further addressed by using a two-stage least-squares (2SLS) method. In the first stage, the number of balance sheet covenants (*Num_BS_Cov*) was regressed on the industry average number of balance sheet covenants (*Ind_Num_BS_Cov*) and all the explanatory variables in the baseline model, where the former was used as an instrumental variable for balance sheet covenant restrictiveness. The results are reported in Column (1) of Appendix B and suggest that the instrumental variable, *Ind_ Num_BS_Cov*, significantly affects balance sheet covenant restrictiveness. In the second stage, the baseline model was estimated using predicted balance sheet covenant restrictiveness (*Pred*(*Num_BS_Cov*)) as the regressor obtained from the first-stage model. Column (2) of Appendix B shows that the estimated coefficient on *Pred*(*Num_BS_Cov*) is significantly positive. This supports the main finding, namely, that balance sheet covenant restrictiveness has a positive effect on the likelihood of equity issuance.

4.4. *Future operating performance*

As an additional analysis, we examined how equity issuance by firms with restrictive balance sheet covenants affects their future operating performance. To test this, the operating performance after the SEO year, defined as operating profit before depreciation scaled by total assets (*Oper_Perf*), was regressed on the equity issuance dummy variable (*EQ_ISSUE*), balance sheet covenant restrictiveness (*Num_BS_Cov* or *Tight_BS_Cov*), and the interaction between these two variables, along with several control variables used in the literature. These controls include book to market

ratio (*BTM*), firm size (*Size*), frequency of default risk (*Default*), sales growth (*Sales_GR*), asset growth (*Asset_GR*), and accruals earnings management (*AEM*)[13] (e.g., Papadaki & Pavlopoulou-Lelaki, 2021). In addition, loan characteristics used in the main model (*Maturity*, *Revolver*, and *Secured*) were included to control for their possible impacts on borrowers' future performance.

[Table 8 around here]

The results are reported in Table 8. Column (1) indicates that the coefficient on *EQ_ISSUE* is significantly negative (-0.012) and that on *EQ_ISSUE* × *Num_BS_Cov* is significantly negative (-0.038), yielding a significantly negative overall coefficient on *EQ_ISSUE* for firms with more-restrictive balance sheet covenants (-0.012 – 0.038 = -0.050; p = 0.014). Similar results are found in Column (2), where *Tight_BS_Cov* is used as a proxy for balance sheet covenant restrictiveness. Specifically, while the coefficient on *EQ_ISSUE* is negative (-0.010) but insignificant, the coefficient on *EQ_ISSUE* × *Tight_BS_Cov* is significant and negative (-0.048), giving a net coefficient of -0.058 (-0.010 – 0.048; p = 0.028) on *EQ_ISSUE* for firms with more-restrictive balance sheet covenants. Taken together, these results provide some evidence that equity issuance by firms with more-restrictive balance sheet covenants is negatively associated with their future operating performance. This suggests that borrowers that make SEOs to increase the probability of avoiding balance sheet covenants may not use the raised capital efficiently.

5. Conclusions

The aim of this study was to examine whether firms are more likely to conduct SEOs when they have more-restrictive balance sheet-based debt covenants. Using hand-collected covenant data from UK private debt contracting, the results show that balance sheet covenant restrictiveness is

[13] *AEM* was particularly included, as it is one of the main determinants of earnings performance in the post-SEO period (Teoh et al., 1998).

positively associated with the probability of conducting equity issuance via private placements. The baseline result is robust to the application of a number of the controls often employed in the literature, including controls for cash shortage, the quality of external governance, the use of earnings management, and the use of balance sheet covenants in the previous loan contract. It is also robust to addressing potential endogeneity concerns. Additionally, equity issuance is negatively associated with the future operating performance of firms with more-restrictive balance sheet covenants, suggesting that these firms may not use the raised capital efficiently.

The current study contributes to the literature in several ways. First, past studies in the equity issuance literature showed that firms make SEOs to take advantage of high valuations, to finance investments, and to meet a near-term need for cash (Chan et al., 2021; DeAngelo et al., 2010; Kim & Weisbach, 2008). The current study extends this literature by providing evidence that the decision to conduct SEOs is also influenced by debt contracts containing balance sheet covenants. The results suggest that having debt covenants that rely on balance sheet amounts appears to be one important determinant of equity issuance. Second, prior studies in the debt covenant literature generally focused on accounting choices and showed that firms use different earnings management methods to remain within covenant limits (e.g., Fan et al., 2019; Franz et al., 2014; Roychowdhury, 2006). Different from these studies, the current study focused on equity issuance and showed that firms conduct SEOs to avoid balance sheet-based covenant violations. The results, thus, suggest that firms meet debt covenants, particularly balance sheet covenants, not only via accounting choices but also via capital contributions from shareholders.

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Table 1. Sample selection and distribution of balance sheet covenants

Panel A: Sample selection

Number of available firm-years in Compustat Global for UK listed firms	16,570
Minus firm-years for financial firms (SIC 6000–6999)	(3,977)
Minus firm-years with no loan covenant information in company annual reports	(11,169)
Minus firm-years with missing values for control variables used in the baseline model	(233)
Total available firm-years of which:	1,191
Firm-years with at least one balance sheet covenant	*190*
Firm-years with SEOs	*136*

Panel B: Distribution of the balance sheet covenants

Balance sheet covenants	Percentage of loans
Net Worth	8.5%
Debt to Equity	5%
Tangible Net Worth	4.3%
Loan to Value	1.3%
Current/Quick Ratio	0.4%
Debt to Tangible Net Worth	0.3%

Panel A shows the sample selection, and Panel B indicates the distribution of balance sheet covenants in the sample firms.

Table 2. Descriptive statistics

Panel A: Summary statistics for the full sample

Variables	N	Mean	10%	25%	50%	75%	90%	SD
EQ_ISSUE$_{t+1}$	1,191	0.114	0.000	0.000	0.000	0.000	1.000	0.318
BS_Cov	1,191	0.160	0.000	0.000	0.000	0.000	1.000	0.366
Num_BS_Cov	1,191	0.120	0.000	0.000	0.000	0.000	0.693	0.283
Tight_BS_Cov	1,091	0.041	0.000	0.000	0.000	0.000	0.000	0.199
Cash	1,191	0.074	0.010	0.026	0.057	0.097	0.164	0.068
BTM	1,191	0.955	0.103	0.285	0.521	0.919	1.669	1.825
Leverage	1,191	0.186	0.032	0.096	0.173	0.247	0.342	0.126
Age	1,191	17.44	8.000	13.00	18.00	23.00	25.00	6.299
ACQ	1,191	0.584	0.000	0.000	1.000	1.000	1.000	0.493
Dividends	1,191	0.025	0.000	0.000	0.026	0.039	0.053	0.022
F_Constraint	1,191	1.993	1.000	1.000	2.000	3.000	3.000	0.817
Size	1,191	5.844	3.293	4.681	5.936	7.148	8.241	1.939
ROA	1,191	0.038	-0.028	0.017	0.044	0.070	0.103	0.068
Loss	1,191	0.160	0.000	0.000	0.000	0.000	1.000	0.366
R&D	1,191	0.012	0.000	0.000	0.000	0.007	0.048	0.030
Tangible	1,191	0.228	0.025	0.061	0.158	0.322	0.569	0.217
Default	1,191	0.500	0.000	0.000	1.000	1.000	1.000	0.500
Maturity	1,191	3.746	3.219	3.611	3.892	4.111	4.111	0.437
Revolver	1,191	0.789	0.000	1.000	1.000	1.000	1.000	0.408
Secured	1,191	0.429	0.000	0.000	0.000	1.000	1.000	0.495

Panel B: Summary statistics for firms with balance sheet and income statement covenants

	Firms with at least one balance sheet covenant		Firms with only income statement covenants		*p*-value, mean difference
Variables	N	Mean	N	Mean	
EQ_ISSUE$_{t+1}$	190	0.168	1,001	0.104	0.010
Num_BS_Cov	190	0.755	-	-	-
Tight_BS_Cov	90	0.500	-	-	-
Net_Worth_Slack	90	0.358	-	-	-
Cash	190	0.086	1,001	0.072	0.009
BTM	190	1.144	1,001	0.919	0.119
Leverage	190	0.177	1,001	0.188	0.271
Age	190	16.56	1,001	17.61	0.035
ACQ	190	0.463	1,001	0.607	0.000
Dividends	190	0.021	1,001	0.026	0.001
F_Constraint	190	2.126	1,001	1.968	0.014
Size	190	5.238	1,001	5.959	0.000
ROA	190	0.020	1,001	0.041	0.000
Loss	190	0.247	1,001	0.143	0.000
R&D	190	0.015	1,001	0.012	0.227
Tangible	190	0.235	1,001	0.227	0.633
Default	190	0.442	1,001	0.511	0.080
Maturity	190	3.749	1,001	3.746	0.931
Revolver	190	0.689	1,001	0.808	0.000
Secured	190	0.521	1,001	0.412	0.005

Panel A provides descriptive statistics for the main variables for the full sample. Panel B shows descriptive statistics for the main variables for firms with at least one balance sheet-based covenant and firms with only income statement

covenants. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *BS_Cov* is equal to 1 if the firm-year had at least one balance sheet-related covenant in a loan contract, 0 if the firm-year had only income statement-related covenants. *Num_BS_Cov* is the natural logarithm of the number of balance sheet covenants in a loan contract. *Tight_BS_Cov* is equal to 1 for firms with tight net worth covenant slack, 0 otherwise. *Net_Worth_Slack* is the net worth covenant slack, defined as the difference between the actual value of the covenant and the threshold value of the covenant, divided by the threshold value of the covenant. *Cash* is the cash-to-total-assets ratio. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Leverage* is the leverage ratio, defined as the sum of long-term debt and short-term debt, divided by the market value of total assets. *Age* is the firm age. *ACQ* is equal to 1 for firms that planned to engage in acquisitions, 0 otherwise. *Dividends* is the ratio of common dividends to the market value of equity. *F_Constraint* is the financial constraint index based on Whited and Wu (2006), where firm-years are ranked into three categories such that the index takes the values of 1 to 3. *Size* is the natural logarithm of the market value of total assets. *ROA* is net income scaled by total assets. *Loss* is equal to 1 for firms with negative net income, 0 otherwise. *R&D* is the ratio of R&D expenses to total revenue. *Tangible* is asset tangibility, defined as net PPE scaled by total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise.

Table 3. Pearson pairwise correlations

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)
(1) EQ_ISSUE_{t+1}	1.000																		
(2) *Num_BS_Cov*	**0.062**	1.000																	
(3) *Tight_BS_Cov*	**0.095**	**0.446**	1.000																
(4) *Cash*	**-0.051**	**0.092**	**0.060**	1.000															
(5) *BTM*	-0.014	0.054	0.008	-0.047	1.000														
(6) *Leverage*	**0.068**	-0.012	0.044	**-0.104**	**0.328**	1.000													
(7) *Age*	**-0.112**	**-0.067**	-0.140	-0.050	**-0.117**	**-0.197**	1.000												
(8) *ACQ*	**0.072**	**-0.106**	-0.012	0.025	**-0.114**	-0.024	-0.025	1.000											
(9) *Dividends*	**-0.057**	**-0.087**	**-0.094**	-0.034	**-0.084**	-0.039	**0.157**	**0.065**	1.000										
(10) *F_Constraint*	**0.061**	**0.073**	**0.180**	0.049	0.037	-0.044	**-0.280**	**-0.113**	**-0.370**	1.000									
(11) *Size*	**-0.081**	**-0.137**	**-0.198**	-0.011	**-0.455**	**-0.182**	**0.314**	**0.172**	**0.191**	**-0.668**	1.000								
(12) *ROA*	**-0.125**	**-0.115**	**-0.159**	-0.005	**-0.188**	**-0.296**	**0.157**	**0.126**	**0.265**	**-0.181**	**0.320**	1.000							
(13) *Loss*	**0.067**	**0.095**	**0.130**	0.054	**0.130**	**0.214**	**-0.121**	**-0.149**	**-0.299**	**0.158**	**-0.216**	**-0.713**	1.000						
(14) *R&D*	0.041	0.017	**0.098**	**0.094**	**-0.073**	**-0.196**	-0.017	0.008	**-0.141**	**0.158**	-0.016	**-0.068**	**0.079**	1.000					
(15) *Tangible*	-0.018	0.033	-0.017	**-0.135**	**0.096**	**0.222**	0.019	**-0.171**	**0.067**	**-0.078**	0.034	0.052	-0.017	**-0.213**	1.000				
(16) *Default*	0.026	**-0.059**	-0.005	**0.129**	**0.060**	**0.109**	**-0.105**	**-0.083**	**-0.091**	0.047	**-0.159**	**-0.410**	**0.339**	0.012	-0.007	1.000			
(17) *Maturity*	-0.009	0.019	**-0.066**	**-0.050**	-0.040	**0.058**	-0.037	**0.078**	-0.015	**-0.114**	**0.168**	0.052	**-0.065**	-0.020	**0.112**	-0.044	1.000		
(18) *Revolver*	-0.028	**-0.122**	**-0.081**	**-0.159**	-0.040	**-0.108**	**0.200**	0.011	**0.145**	**-0.138**	**0.134**	**0.104**	**-0.118**	**-0.072**	0.020	-0.030	**-0.087**	1.000	
(19) *Secured*	**0.073**	**0.077**	**0.068**	**-0.166**	**0.082**	**0.094**	**-0.177**	-0.026	**-0.114**	**0.252**	**-0.271**	**-0.133**	**0.086**	-0.015	0.003	0.052	0.017	0.028	1.000

This table reports the Pearson correlations for variables used in the empirical analysis. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *Num_BS_Cov* is the natural logarithm of the number of balance sheet covenants in a loan contract. *Tight_BS_Cov* is equal to 1 for firms with tight net worth covenant slack, 0 otherwise. *Cash* is the cash-to-total-assets ratio. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Leverage* is the leverage ratio, defined as the sum of long-term debt and short-term debt, divided by the market value of total assets. *Age* is the firm age. *ACQ* is equal to 1 for firms that planned to engage in acquisitions, 0 otherwise. *Dividends* is the ratio of common dividends to the market value of equity. *F_Constraint* is the financial constraint index based on Whited and Wu (2006), where firm-years are ranked into three categories such that the index takes the values of 1 to 3. *Size* is the natural logarithm of the market value of total assets. *ROA* is net income scaled by total assets. *Loss* is equal to 1 for firms with negative net income, 0 otherwise. *R&D* is the ratio of R&D expenses to total revenue. *Tangible* is asset tangibility, defined as net PPE scaled by total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise. Amounts in bold are significant at the 5% level.

Table 4. Balance sheet covenant restrictiveness and SEOs

Variables	(1) EQ_ISSUE_{t+1}	(2) EQ_ISSUE_{t+1}	(3) EQ_ISSUE_{t+1}
BS_Cov	0.634***		
	(2.683)		
Num_BS_Cov		0.721**	
		(2.377)	
Tight_BS_Cov			0.795**
			(2.098)
Cash	-3.360**	-3.344**	-3.445**
	(-2.210)	(-2.180)	(-2.048)
BTM	-0.150*	-0.153**	-0.191**
	(-1.913)	(-1.963)	(-2.387)
Leverage	1.413*	1.365*	1.239
	(1.785)	(1.728)	(1.390)
Age	-0.050***	-0.050***	-0.050**
	(-2.662)	(-2.640)	(-2.552)
ACQ	0.694***	0.684***	0.655**
	(2.826)	(2.807)	(2.435)
Dividends	-0.683	-0.821	-2.170
	(-0.102)	(-0.122)	(-0.310)
F_Constraint	-0.205	-0.216	-0.303
	(-0.997)	(-1.054)	(-1.373)
Size	-0.155	-0.161	-0.170
	(-1.575)	(-1.643)	(-1.622)
ROA	-4.288*	-4.345*	-4.121
	(-1.789)	(-1.821)	(-1.490)
Loss	-0.113	-0.103	-0.328
	(-0.299)	(-0.275)	(-0.795)
R&D	3.240	3.422	1.448
	(0.989)	(1.052)	(0.369)
Tangible	-0.138	-0.129	-0.003
	(-0.292)	(-0.268)	(-0.005)
Default	-0.077	-0.082	0.010
	(-0.301)	(-0.320)	(0.037)
Maturity	-0.131	-0.138	-0.049
	(-0.575)	(-0.604)	(-0.197)
Revolver	-0.030	-0.029	-0.022
	(-0.118)	(-0.113)	(-0.083)
Secured	0.210	0.209	0.283
	(1.071)	(1.062)	(1.346)
Constant	-0.784	-0.611	-0.880
	(-0.481)	(-0.373)	(-0.433)
Industry fixed effects	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes
Pseudo R^2	0.097	0.096	0.097
N	1,191	1,191	1,091

This table shows the regression results for testing whether firms are more likely to make SEOs when they have more-restrictive balance sheet covenants. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *BS_Cov* is equal to 1 if the firm-year had at least one balance sheet-related covenant in a loan contract, 0 if the firm-year had only income statement-related covenants. *Num_BS_Cov* is the natural logarithm of the number of balance sheet covenants

in a loan contract. *Tight_BS_Cov* is equal to 1 for firms with tight net worth covenant slack, 0 otherwise. *Cash* is the cash-to-total-assets ratio. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Leverage* is the leverage ratio, defined as the sum of long-term debt and short-term debt, divided by the market value of total assets. *Age* is the firm age. *ACQ* is equal to 1 for firms that planned to engage in acquisitions, 0 otherwise. *Dividends* is the ratio of common dividends to the market value of equity. *F_Constraint* is the financial constraint index based on Whited and Wu (2006), where firm-years are ranked into three categories such that the index takes the values of 1 to 3. *Size* is the natural logarithm of the market value of total assets. *ROA* is net income scaled by total assets. *Loss* is equal to 1 for firms with negative net income, 0 otherwise. *R&D* is the ratio of R&D expenses to total revenue. *Tangible* is asset tangibility, defined as net PPE scaled by total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise. Reported *z*-statistics are based on standard errors clustered by firm. ***/**/* indicate significance at 1%/5%/10% level, respectively.

Table 5. Additional controls

Variables	(1) EQ_ISSUE_{t+1}	(2) EQ_ISSUE_{t+1}	(3) EQ_ISSUE_{t+1}	(4) EQ_ISSUE_{t+1}	(5) EQ_ISSUE_{t+1}	(6) EQ_ISSUE_{t+1}	(7) EQ_ISSUE_{t+1}
Num_BS_Cov	0.776**		0.638**		0.788**		1.136***
	(2.447)		(2.035)		(2.393)		(3.036)
Tight BS Cov		0.822**		0.775**		0.814**	
		(2.135)		(2.089)		(2.071)	
CFO	-3.206	-4.860*					
	(-1.285)	(-1.755)					
Current	-0.290	-0.363					
	(-1.259)	(-1.092)					
Sales_GR	-0.041	-0.396					
	(-0.077)	(-0.665)					
INST_OWN			-0.394	-0.598			
			(-0.563)	(-0.730)			
AU_EXP			0.187	0.298			
			(0.867)	(1.283)			
REM					0.318	0.320	
					(0.831)	(0.816)	
AEM					3.055	3.716	
					(1.386)	(1.510)	
PrevNum_BS_Cov							-0.648
							(-1.637)
Cash	-2.873*	-2.771	-3.298**	-3.760**	-3.936**	-3.961**	-3.314**
	(-1.822)	(-1.519)	(-1.993)	(-2.035)	(-2.242)	(-2.004)	(-2.142)
BTM	-0.153*	-0.206**	-0.121	-0.191*	-0.174*	-0.247**	-0.155**
	(-1.844)	(-2.356)	(-1.245)	(-1.793)	(-1.904)	(-2.437)	(-2.033)
Leverage	1.447*	1.360	1.943**	1.873**	1.683*	1.627	1.363*
	(1.738)	(1.395)	(2.299)	(1.993)	(1.863)	(1.534)	(1.740)
Age	-0.049***	-0.051***	-0.053***	-0.055***	-0.040*	-0.039*	-0.048**
	(-2.614)	(-2.644)	(-2.793)	(-2.794)	(-1.867)	(-1.700)	(-2.572)
ACQ	0.714***	0.699***	0.609**	0.602**	0.794***	0.758**	0.702***
	(2.971)	(2.635)	(2.570)	(2.287)	(2.919)	(2.537)	(2.856)
Dividends	-0.340	-0.984	-2.732	-3.810	2.061	0.880	-0.528
	(-0.050)	(-0.140)	(-0.393)	(-0.532)	(0.292)	(0.119)	(-0.079)
F Constraint	-0.215	-0.303	-0.223	-0.315	-0.100	-0.168	-0.210
	(-1.042)	(-1.327)	(-1.038)	(-1.345)	(-0.425)	(-0.669)	(-1.023)
Size	-0.153	-0.159	-0.189*	-0.222*	-0.160	-0.158	-0.165*
	(-1.537)	(-1.453)	(-1.663)	(-1.817)	(-1.451)	(-1.370)	(-1.695)
ROA	-3.503	-2.405	-4.981**	-4.961*	-5.681**	-6.224*	-4.353*
	(-1.342)	(-0.806)	(-2.005)	(-1.726)	(-2.095)	(-1.935)	(-1.826)
Loss	-0.045	-0.251	-0.166	-0.405	-0.054	-0.362	-0.092
	(-0.120)	(-0.616)	(-0.440)	(-0.994)	(-0.133)	(-0.803)	(-0.242)
R&D	3.962	2.116	2.898	1.167	3.872	2.614	3.580
	(1.168)	(0.521)	(0.868)	(0.288)	(1.120)	(0.651)	(1.114)
Tangible	-0.203	-0.103	-0.471	-0.255	0.017	0.134	-0.107
	(-0.385)	(-0.173)	(-0.953)	(-0.499)	(0.034)	(0.254)	(-0.222)
Default	-0.218	-0.161	-0.114	-0.038	-0.254	-0.172	-0.079
	(-0.758)	(-0.497)	(-0.426)	(-0.131)	(-0.824)	(-0.508)	(-0.307)
Maturity	-0.150	-0.065	-0.138	-0.045	-0.001	0.047	-0.114
	(-0.645)	(-0.255)	(-0.589)	(-0.177)	(-0.003)	(0.174)	(-0.502)
Revolver	0.024	0.020	-0.000	0.030	-0.056	-0.054	-0.035
	(0.094)	(0.077)	(-0.002)	(0.108)	(-0.203)	(-0.190)	(-0.138)
Secured	0.171	0.238	0.239	0.313	0.133	0.213	0.208
	(0.849)	(1.095)	(1.174)	(1.473)	(0.658)	(0.969)	(1.058)
Constant	0.053	0.154	-0.485	-0.289	-1.410	-1.369	-0.765
	(0.033)	(0.080)	(-0.279)	(-0.134)	(-0.767)	(-0.608)	(-0.469)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R^2	0.101	0.106	0.102	0.107	0.101	0.103	0.098
N	1,191	1,091	1,135	1,041	974	887	1,191

This table shows the regression results for the main analysis (a) when imposing additional controls for the need of cash, proxied by free cash flows scaled by total assets (*CFO*), current ratios (*Current*), and sales growth (*Sales_GR*) [Columns 1 and 2]; (b) when controlling for the quality of external governance, proxied by institutional ownership (*INST_OWN*) and auditor quality (*AU_EXP*) [Columns 3 and 4]; (c) when imposing controls for real (*REM*) and accruals (*AEM*) earnings management [Columns 5 and 6]; and (d) when including a control for the natural logarithm of the number of balance sheet covenants used in the

previous loan contract (*PrevNum_BS_Cov*) [Column 7]. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *Num_BS_Cov* is the natural logarithm of the number of balance sheet covenants in a loan contract. *Tight_BS_Cov* is equal to 1 for firms with tight net worth covenant slack, 0 otherwise. *Cash* is the cash-to-total-assets ratio. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Leverage* is the leverage ratio, defined as the sum of long-term debt and short-term debt, divided by the market value of total assets. *Age* is the firm age. *ACQ* is equal to 1 for firms that planned to engage in acquisitions, 0 otherwise. *Dividends* is the ratio of common dividends to the market value of equity. *F_Constraint* is the financial constraint index based on Whited and Wu (2006), where firm-years are ranked into three categories such that the index takes values of 1 to 3. *Size* is the natural logarithm of the market value of total assets. *ROA* is net income scaled by total assets. *Loss* is equal to 1 for firms with negative net income, 0 otherwise. *R&D* is the ratio of R&D expenses to total revenue. *Tangible* is asset tangibility, defined as net PPE scaled by total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise. Reported *z*-statistics are based on standard errors clustered by firm. ***/**/* indicate significance at 1%/5%/10% level, respectively.

Table 6. Two-period lag and homogenous sample

Variables	(1) EQ_ISSUE_{t+2}	(2) EQ_ISSUE_{t+2}	(3) EQ_ISSUE_{t+1}	(4) EQ_ISSUE_{t+1}
Num_BS_Cov	0.730**		1.167***	
	(2.222)		(3.218)	
Tight_BS_Cov		1.167**		0.923*
		(2.561)		(1.869)
Cash	-5.501***	-5.592***	-3.539*	-3.534
	(-3.262)	(-2.778)	(-1.812)	(-1.597)
BTM	-0.122	-0.102	-0.213*	-0.189*
	(-1.509)	(-1.156)	(-1.788)	(-1.728)
Leverage	-0.147	-0.915	0.804	0.703
	(-0.147)	(-0.826)	(0.823)	(0.640)
Age	-0.051***	-0.048**	-0.044*	-0.048**
	(-2.745)	(-2.303)	(-1.889)	(-1.995)
ACQ	0.333	0.257	0.836***	0.707**
	(1.390)	(1.008)	(2.901)	(2.174)
Dividends	-2.054	-3.581	-5.274	-7.159
	(-0.364)	(-0.629)	(-0.653)	(-0.874)
F_Constraint	-0.321*	-0.338*	-0.164	-0.271
	(-1.691)	(-1.654)	(-0.649)	(-1.005)
Size	-0.237**	-0.192*	-0.201*	-0.168
	(-2.494)	(-1.941)	(-1.728)	(-1.359)
ROA	0.554	0.715	-1.668	-1.325
	(0.244)	(0.293)	(-0.555)	(-0.358)
Loss	0.701*	0.583	0.198	-0.121
	(1.755)	(1.371)	(0.461)	(-0.243)
R&D	0.809	-1.216	3.959	1.541
	(0.254)	(-0.365)	(0.975)	(0.302)
Tangible	-0.516	-0.835	0.120	0.101
	(-0.907)	(-1.479)	(0.203)	(0.154)
Default	0.213	0.208	0.132	0.169
	(0.929)	(0.859)	(0.459)	(0.554)
Maturity	0.093	0.335	0.111	0.172
	(0.370)	(1.162)	(0.374)	(0.535)
Revolver	-0.093	-0.096	-0.022	-0.044
	(-0.363)	(-0.355)	(-0.063)	(-0.119)
Secured	0.113	0.149	0.257	0.337
	(0.561)	(0.649)	(1.074)	(1.248)
Constant	1.493	0.702	-1.879	-1.094
	(0.966)	(0.428)	(-0.938)	(-0.452)
Industry fixed effects	Yes	Yes	Yes	Yes
Year fixed effects	Yes	Yes	Yes	Yes
Pseudo R^2	0.097	0.099	0.106	0.089
N	1,125	1,028	817	754

This table shows the regression results for the main analysis (a) when equity issuance was measured in year $t + 2$ instead of year $t + 1$ [Columns 1 and 2] and (b) when using an homogenous sample by excluding the crisis period [Columns 3 and 4]. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *Num_BS_Cov* is the natural logarithm of the number of balance sheet covenants in a loan contract. *Tight_BS_Cov* is equal to 1 for firms with tight net worth covenant slack, 0 otherwise. *Cash* is the cash-to-total-assets ratio. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Leverage* is the leverage ratio, defined as the sum of long-term debt

and short-term debt, divided by the market value of total assets. *Age* is the firm age. *ACQ* is equal to 1 for firms that planned to engage in acquisitions, 0 otherwise. *Dividends* is the ratio of common dividends to the market value of equity. *F_Constraint* is the financial constraint index based on Whited and Wu (2006), where firm-years are ranked into three categories such that the index takes the values of 1 to 3. *Size* is the natural logarithm of the market value of total assets. *ROA* is net income scaled by total assets. *Loss* is equal to 1 for firms with negative net income, 0 otherwise. *R&D* is the ratio of R&D expenses to total revenue. *Tangible* is asset tangibility, defined as net PPE scaled by total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise. Reported *z*-statistics are based on standard errors clustered by firm. ***/**/* indicate significance at 1%/5%/10% level, respectively.

Table 7. Propensity score matching

Panel A: First-stage and second-stage models for the propensity score–matching procedures

	First stage	Second stage
	(1)	(2)
Variables	*BS_Cov*	EQ_ISSUE_{t+1}
BS_Cov		0.833**
		(2.150)
Cash	5.715***	-7.398**
	(4.241)	(-2.286)
BTM	-0.132**	-0.450*
	(-2.019)	(-1.665)
Leverage	-1.728**	3.470*
	(-2.063)	(1.649)
Age	0.000	-0.028
	(0.027)	(-0.799)
ACQ	-0.314	0.859**
	(-1.568)	(2.349)
Dividends	-12.051**	7.113
	(-2.410)	(0.581)
F_Constraint	-0.437**	0.445
	(-2.216)	(0.947)
Size	-0.328***	0.047
	(-3.584)	(0.254)
ROA	-4.246**	-0.765
	(-2.224)	(-0.235)
Loss	0.109	0.647
	(0.323)	(0.846)
R&D	6.297*	11.460***
	(1.911)	(2.663)
Tangible	0.825*	-1.569*
	(1.772)	(-1.674)
Default	-0.988***	-0.798
	(-4.328)	(-1.596)
Maturity	-0.034	-0.319
	(-0.159)	(-0.813)
Revolver	-0.252	-0.362
	(-1.140)	(-0.772)
Secured	0.295	0.310
	(1.490)	(0.793)
Loan_Purpose	-0.665***	
	(-3.428)	
Perf_Pricing	-0.046	
	(-0.227)	
Uncertainty	-3.511**	
	(-2.188)	
Constant	6.236***	-1.841
	(4.353)	(-0.657)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
Pseudo R^2	0.184	0.155
N	1,151	310

Panel B: Post-match differences

	Firms with at least one balance sheet covenant		Firms with only income statement covenants		*p*-value mean difference
Variables	N	Mean	N	Mean	
Cash	155	0.084	155	0.080	0.626
BTM	155	1.089	155	1.231	0.555
Leverage	155	0.181	155	0.172	0.547
Age	155	16.60	155	17.04	0.540
ACQ	155	0.535	155	0.510	0.651
Dividends	155	0.022	155	0.020	0.625
F_Constraint	155	2.129	155	2.187	0.523
Size	155	5.282	155	5.080	0.337
ROA	155	0.026	155	0.034	0.335
Loss	155	0.213	155	0.200	0.780
R&D	155	0.011	155	0.012	0.654
Tangible	155	0.241	155	0.263	0.413
Default	155	0.477	155	0.452	0.650
Maturity	155	3.739	155	3.723	0.774
Revolver	155	0.748	155	0.768	0.692
Secured	155	0.497	155	0.510	0.821
Loan_Purpose	155	0.426	155	0.439	0.819
Perf_Pricing	155	0.342	155	0.335	0.905
Uncertainty	155	0.034	155	0.038	0.568

This table shows summary statistics of the propensity score–matching procedures. Column (1) of Panel A indicates the results for the probit model employed to measure propensity scores. Column (2) of Panel A presents the results for the main analysis using the propensity matched sample. Panel B indicates the sample means of the firm and deal characteristics for the treatment and matched firms. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *BS_Cov* is equal to 1 if the firm-year had at least one balance sheet-related covenant in a loan contract, 0 if the firm-year had only income statement-related covenants. *Cash* is the cash-to-total-assets ratio. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Leverage* is the leverage ratio, defined as the sum of long-term debt and short-term debt, divided by the market value of total assets. *Age* is the firm age. *ACQ* is equal to 1 for firms that planned to engage in acquisitions, 0 otherwise. *Dividends* is the ratio of common dividends to the market value of equity. *F_Constraint* is the financial constraint index based on Whited and Wu (2006), where firm-years are ranked into three categories such that the index takes the values of 1 to 3. *Size* is the natural logarithm of the market value of total assets. *ROA* is net income scaled by total assets. *Loss* is equal to 1 for firms with negative net income, 0 otherwise. *R&D* is the ratio of R&D expenses to total revenue. *Tangible* is asset tangibility, defined as net PPE scaled by total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise. *Loan_Purpose* is equal to 1 for a deal contract where the purpose of the loan was to fund operating or financing activities, 0 otherwise. *Perf_Pricing* is equal to 1 for the use of a performance pricing provision in a loan contract, 0 otherwise. *Uncertainty* is the cross-sectional standard deviation of quarterly profit growth by industry. Reported *z*-statistics are based on standard errors clustered by firm. ***/**/* indicate significance at 1%/5%/10% level, respectively.

Table 8. Future operating performance

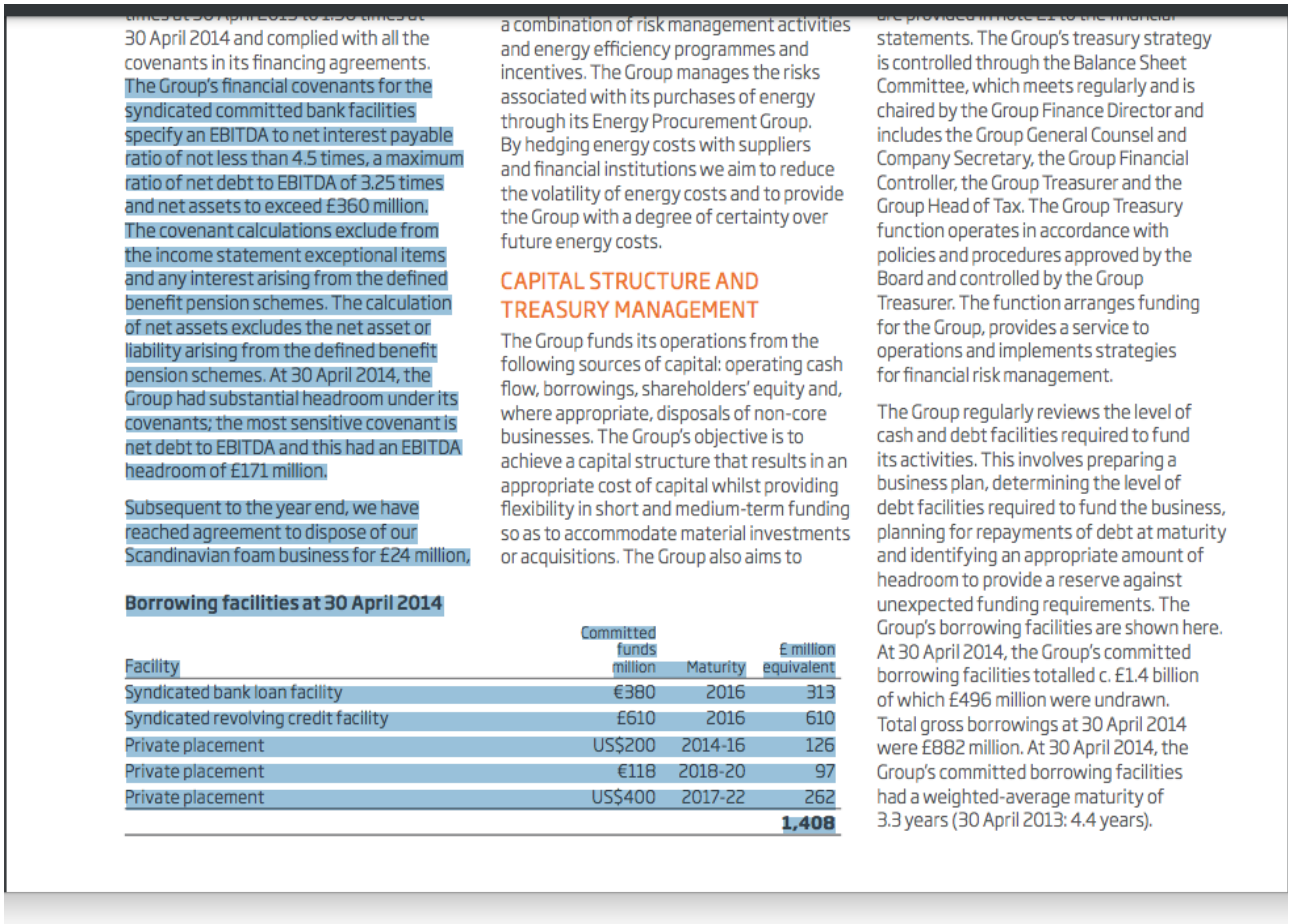
Variables	(1) $Oper\_Perf_{t+1}$	(2) $Oper\_Perf_{t+1}$
EQ_ISSUE	-0.012*	-0.010
	(-1.739)	(-1.543)
Num_BS_Cov	0.009	
	(0.622)	
EQ_ISSUE × Num_BS_Cov	-0.038*	
	(-1.717)	
Tight_BS_Cov		-0.006
		(-0.573)
EQ_ISSUE × Tight_BS_Cov		-0.048*
		(-1.781)
BTM	-0.006**	-0.004
	(-2.238)	(-1.579)
Size	0.005**	0.005**
	(2.202)	(2.359)
Default	-0.027***	-0.023***
	(-3.284)	(-2.859)
Sales_GR	0.037**	0.045***
	(2.182)	(2.845)
Asset_GR	-0.006	0.001
	(-0.577)	(0.064)
AEM	-0.191***	-0.258***
	(-2.934)	(-4.298)
Maturity	-0.011*	-0.012**
	(-1.899)	(-2.072)
Revolver	0.026***	0.021**
	(2.997)	(2.347)
Secured	-0.012	-0.015*
	(-1.506)	(-1.794)
Constant	0.147***	0.164***
	(4.407)	(4.633)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R^2	0.255	0.294
N	876	793

This table shows the regression results for testing the effect of SEOs on future operating performance. *Oper_Perf* is the operating profit before depreciation scaled by total assets. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *Num_BS_Cov* is the natural logarithm of the number of balance sheet covenants in a loan contract. *Tight_BS_Cov* is equal to 1 for firms with tight net worth covenant slack, 0 otherwise. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Size* is the natural logarithm of the market value of total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Sales_GR* is sales growth. *Asset_GR* is asset growth. *AEM* is accruals earnings management. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise. Reported *t*-statistics are based on standard errors clustered by firm. ***/**/* indicate significance at 1%/5%/10% level, respectively.

Appendix A. Manual Covenant Data Collection Process from Company Annual Reports

In using company annual reports to collect covenant data, we (a) checked whether the company had private debt contract agreements, (b) identified whether these agreements included any financial covenants (more importantly, balance sheet-based covenants), and (c) looked for information about their threshold values. To better illustrate this process, the following examples of relevant extracts from company annual reports are provided. These extracts are from DS Smith's 2014 and Brammer's 2010 annual reports. Both companies disclosed that they have private debt contracts that included several financial covenants. Among these covenants, net worth or net assets is the balance sheet-based covenant. The threshold value of the net worth covenant was identified as £360 million for DS Smith and £25 million for Brammer.

DS Smith PLC (Annual Report 2014, p. 23)



30 April 2014 and complied with all the covenants in its financing agreements. The Group's financial covenants for the syndicated committed bank facilities specify an EBITDA to net interest payable ratio of not less than 4.5 times, a maximum ratio of net debt to EBITDA of 3.25 times and net assets to exceed £360 million. The covenant calculations exclude from the income statement exceptional items and any interest arising from the defined benefit pension schemes. The calculation of net assets excludes the net asset or liability arising from the defined benefit pension schemes. At 30 April 2014, the Group had substantial headroom under its covenants; the most sensitive covenant is net debt to EBITDA and this had an EBITDA headroom of £171 million.

Subsequent to the year end, we have reached agreement to dispose of our Scandinavian foam business for £24 million,

a combination of risk management activities and energy efficiency programmes and incentives. The Group manages the risks associated with its purchases of energy through its Energy Procurement Group. By hedging energy costs with suppliers and financial institutions we aim to reduce the volatility of energy costs and to provide the Group with a degree of certainty over future energy costs.

CAPITAL STRUCTURE AND TREASURY MANAGEMENT

The Group funds its operations from the following sources of capital: operating cash flow, borrowings, shareholders' equity and, where appropriate, disposals of non-core businesses. The Group's objective is to achieve a capital structure that results in an appropriate cost of capital whilst providing flexibility in short and medium-term funding so as to accommodate material investments or acquisitions. The Group also aims to

statements. The Group's treasury strategy is controlled through the Balance Sheet Committee, which meets regularly and is chaired by the Group Finance Director and includes the Group General Counsel and Company Secretary, the Group Financial Controller, the Group Treasurer and the Group Head of Tax. The Group Treasury function operates in accordance with policies and procedures approved by the Board and controlled by the Group Treasurer. The function arranges funding for the Group, provides a service to operations and implements strategies for financial risk management.

The Group regularly reviews the level of cash and debt facilities required to fund its activities. This involves preparing a business plan, determining the level of debt facilities required to fund the business, planning for repayments of debt at maturity and identifying an appropriate amount of headroom to provide a reserve against unexpected funding requirements. The Group's borrowing facilities are shown here. At 30 April 2014, the Group's committed borrowing facilities totalled c. £1.4 billion of which £496 million were undrawn. Total gross borrowings at 30 April 2014 were £882 million. At 30 April 2014, the Group's committed borrowing facilities had a weighted-average maturity of 3.3 years (30 April 2013: 4.4 years).

Borrowing facilities at 30 April 2014

Facility	Committed funds million	Maturity	£ million equivalent
Syndicated bank loan facility	€380	2016	313
Syndicated revolving credit facility	£610	2016	610
Private placement	US$200	2014-16	126
Private placement	€118	2018-20	97
Private placement	US$400	2017-22	262
			1,408

Brammer PLC (Annual Report 2010, p. 20)

the change to CPI. The main demographic assumptions used are unchanged. The charge recognised in the income statement decreased by £0.7 million to £0.6 million (2009: £1.3 million) as a result of an increase in the expected return on scheme assets.

Treasury

In November 2008 the company entered into a three year revolving credit finance facility which provided for borrowings of €165 million. Following the rights issue in November 2009, the facility was reduced by €20.7 million in December 2009 and €11.4 million in May 2010. In October 2010 the company made a voluntary reduction of €12.9 million. The amount of finance available under this facility as at 31 December 2010 was therefore €120.0 million (£102.8 million). This facility can be drawn until it expires on 28 February 2012. In addition to the revolving credit facility, the company also has £21 million of other available financing facilities. The revolving credit facility requires, among other matters, compliance with three financial covenant ratios. These requirements are (1) the ratio of net debt to EBITDA shall not be greater than 3.25:1; (2) consolidated net worth shall exceed £25 million and (3) the ratio of consolidated profit plus consolidated rent to net interest plus consolidated rent shall exceed 2.50:1. EBITDA is a measure of liquidity and is defined in the finance facility.

contracts, the group has a track record of maintaining gross margin irrespective of sales volumes thereby successfully pushing back market pricing pressure to its suppliers.

Principal risks and uncertainties

The management of the business and the execution of the strategy are subject to a number of risks and uncertainties.

Operational risks are assessed by Brammer subsidiaries. These are reviewed with appropriate mitigation considered by Brammer management. The Board reviews these assessments on a regular basis.

A formal group-wide review of strategic risks is performed by the board. Appropriate processes and controls are also put in place to monitor and mitigate these risks.

The principal risks affecting the group are as follows:

Slowdown of industrial activity

The group has a well spread market and geographic presence and has concentrated growth activities in defensive sectors such as Food and Drink, Utilities and Fast Moving Consumer Goods. The company has demonstrated the capability to reduce costs and the ability to align the cost base in response to market conditions.

Appendix B. Two-Stage Least-Squares Regressions

	First stage	Second stage
	(1)	(2)
Variable	*Num_BS_Cov*	EQ_ISSUE_{t+1}
Ind_ Num_BS_Cov	0.709***	
	(6.417)	
Pred(Num_BS_Cov)		5.555**
		(2.369)
Cash	0.543**	-6.088***
	(2.079)	(-2.902)
BTM	-0.016**	-0.072
	(-2.264)	(-0.849)
Leverage	-0.152	2.107**
	(-1.396)	(2.545)
Age	-0.000	-0.048**
	(-0.093)	(-2.572)
ACQ	-0.039	0.892***
	(-1.421)	(3.343)
Dividends	-0.729	3.409
	(-1.441)	(0.517)
F_Constraint	-0.040**	-0.012
	(-1.996)	(-0.054)
Size	-0.027***	-0.016
	(-2.641)	(-0.140)
ROA	-0.432	-2.211
	(-1.580)	(-0.900)
Loss	0.011	-0.145
	(0.296)	(-0.390)
R&D	0.354	1.627
	(0.851)	(0.462)
Tangible	0.103	-0.587
	(1.229)	(-1.139)
Default	-0.086***	0.358
	(-3.016)	(1.028)
Maturity	0.012	-0.226
	(0.439)	(-0.980)
Revolver	-0.046	0.157
	(-1.285)	(0.608)
Secured	0.036	0.042
	(1.042)	(0.188)
Constant	0.400**	-4.856*
	(2.056)	(-1.771)
Industry fixed effects	Yes	Yes
Year fixed effects	Yes	Yes
R^2/Pseudo R2	0.187	0.100
N	1,191	1,191

This table shows the regression results for two-stage least-squares (2SLS) regressions, where the natural logarithm of the industry average number of the balance sheet covenants (*Ind_ Num_BS_Cov*) was used as the instrumental variable. *EQ_ISSUE* is equal to 1 if the firm made an SEO, 0 if it did not. *Num_BS_Cov* is the natural logarithm of the number of balance sheet covenants in a loan contract. *Pred(Num_BS_Cov)* is the predicted value of *Num_BS_Cov* from the

first-stage estimation. *Cash* is the cash-to-total-assets ratio. *BTM* is the book-to-market ratio, measured as the book value of equity divided by the market value of equity. *Leverage* is the leverage ratio, defined as the sum of long-term debt and short-term debt, divided by the market value of total assets. *Age* is the firm age. *ACQ* is equal to 1 for firms that planned to engage in acquisitions, 0 otherwise. *Dividends* is the ratio of common dividends to the market value of equity. *F_Constraint* is the financial constraint index based on Whited and Wu (2006), where firm-years are ranked into three categories such that the index takes values of 1 to 3. *Size* is the natural logarithm of the market value of total assets. *ROA* is net income scaled by total assets. *Loss* is equal to 1 for firms with negative net income, 0 otherwise. *R&D* is the ratio of R&D expenses to total revenue. *Tangible* is asset tangibility, defined as net PPE scaled by total assets. *Default* is equal to 1 for firms with a Z-score less than the sample median, 0 otherwise. *Maturity* is the natural logarithm of the number of months to maturity. *Revolver* is equal to 1 for loan contracts that included a revolving facility, 0 otherwise. *Secured* is equal to 1 for loan contracts where debt was secured, 0 otherwise. Reported *z*-statistics are based on standard errors clustered by firm. ***/**/* indicate significance at 1%/5%/10% level, respectively.