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EBITDA Add-backs in Debt Contracting: A Step Too Far?*

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Financial covenants in syndicated loan agreements often rely on definitions of EBITDA that deviate from the GAAP definition. We document the increased usage of non-GAAP addbacks to EBITDA in recent times. Using the 2013 Interagency Guidance on Leveraged Lending, which we argue led to an exogenous increase in non-GAAP EBITDA addbacks, we show that these addbacks increase the likelihood of loan delinquency and default, and also increase the likelihood of the borrower experiencing a ratings downgrade. Greater use of non-GAAP EBITDA addbacks also makes it more likely that lead arrangers lower their loan share exposures through secondary market sales. Our results highlight that covenants based on customized measures of EBITDA hurt loan performance by worsening lead arrangers' incentives to monitor borrowers and by hampering their ability to take timely corrective actions.

Keywords: Syndicated Loans, Credit Agreement, Financial Covenant, EBITDA, Add-backs, GAAP, Leveraged Lending Guidance, Borrower Performance, Loan Performance, Lead Arranger, Lender Monitoring, Loan Sales

JEL Classification: G21, G23, G28, G32, G34

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Introduction

Earnings Before Interest, Taxes, Depreciation, and Amortization (EBITDA) is widely used in loan contracts to design financial covenants which are used to limit the borrower’s leverage (e.g., debt-to-EBITDA covenant) and maintain their ability to service the debt (e.g., several coverage ratio covenants such as EBITDA/Interest Expense). Interestingly, while designing such covenants, lead banks and borrowers frequently deviate from the Generally Accepted Accounting Principles (GAAP) definition of EBITDA. In particular, anecdotal evidence from industry reports suggests that loan agreements often define EBITDA to include a number of non-GAAP add backs. This results in the covenants being defined on inflated EBITDA values and potentially helps understate the true leverage or credit risk of the borrower.¹ Despite its growing popularity, we have a limited understanding of the prevalence of EBITDA addbacks in loan contracts, how they relate to borrower characteristics, and how they affect loan performance. These are important issues because covenants act as early warning “trip wires” for deterioration in firm performance (Triantis and Daniels (1995), Li et al. (2016)) and give banks the right to renegotiate loans and take corrective actions when violated (Chava and Roberts (2008); Nini et al. (2009); Roberts and Sufi (2009)); and theory suggests that these features of covenants increase banks’ incentives to monitor loans (Rajan and Winton (1995); Garleanu and Zwiebel (2009)). Therefore, covenants based on inflated measures of EBITDA, by diluting some of these protective features have the potential to hurt loan performance by worsening banks’ incentives to monitor borrowers and hampering their ability to take timely corrective actions.

In this paper we examine the definitions of EBITDA in a large sample of loan agreements, and create measures to quantify the non-GAAP deviations in these definitions. In general, non-GAAP deviations may involve both addbacks and deductions. We provide descriptive statistics on the prevalence of non-GAAP deviations in EBITDA definitions, and relate these to borrower characteristics. The key focus of our paper, however, is on identifying the effect of such deviations on

¹A recent study by S&P Global examined the validity and accuracy of EBITDA addbacks in a sample of merger and acquisition (M&A) and leveraged buyout (LBO) transactions, and found that issuers’ projected adjusted EBITDA at deal inception exceeded actual realized EBITDA in the two calendar years following the year of origination by about 30% on average. EBITDA addbacks understate actual future leverage and credit risk, and contribute to incremental event risk as many covenant baskets are tied to EBITDA. See details at <https://www.spglobal.com/ratings/en/research/articles/201124-elevated-ebitda-addbacks-are-a-continuing-trend-11745701>.

subsequent loan performance and borrower performance. While it is challenging to identify the causal effects of covenant design on loan and borrower performance, we exploit the 2013 Interagency Guidance on Leveraged Lending, which we argue led to an exogenous increase in EBITDA addbacks, to show that EBITDA addbacks have an adverse effect on subsequent loan and borrower performance. Moreover, we show that the adverse effects arise because EBITDA addbacks worsen lead arrangers’ incentives to monitor borrowers and encourage them to sell their loan holdings in the secondary loan market.

We obtain the data for our analysis from multiple sources. We use Loan Pricing Corporation’s Dealscan database to identify all loan packages originated over the 1995–2019 period which feature an EBITDA-based covenant. For each of these 8,488 loan packages, we try to obtain the credit agreement from BamSEC (www.BamSEC.com), a search engine and data extraction tool that focuses on SEC filings. We are able to obtain the credit agreements for 4,940 loan packages after searching BamSEC using the borrower’s name, ticker symbol, and the deal date. We obtain measures of ex-post loan performance from a U.S. supervisory register of syndicated loans – the Shared National Credit Program (SNC). This data is maintained by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency. SNC provides information on whether a borrower has missed a scheduled payment (“non-accruing” loan), the number of days past the missed payment due date, and the loan’s default status. SNC also provides yearly information on the loan ownership of lead arrangers, which allows us to identify whether the lead arranger has reduced its exposure to the loan or quit the syndicate altogether. We link Dealscan to SNC based on borrower name, lender name, loan origination date, loan amount and loan type. We obtain borrowers’ financial information from COMPUSTAT, and credit rating information from S&P ratings database.

We parse the credit agreements using a text processing software to extract the definition of one or more of EBIT, EBITDA, Consolidated EBITDA, Consolidated Adjusted EBITDA, and EBITDAR (henceforth, we collectively refer to these as EBITDA) employed in the credit agreement. We are able to obtain a usable definition for 4,112 loan packages and 6,295 loan facilities. We then parse these definitions to itemize the components that are added back and those that are deducted from net income to arrive at EBITDA, and classify these as either GAAP or non-GAAP. In particular, in

definitions that start with net income, we classify the addbacks corresponding to interest expense, taxes, depreciation and amortization as GAAP addbacks. All other addbacks are classified as non-GAAP, and these include items such as non-cash expense, non-recurring expense, etc. The GAAP definition of EBITDA does not require any items to be deducted from the net income. Therefore, we classify all deductions as non-GAAP deductions, and these include items such as non-cash income (including interest income, tax credit), non-recurring income, etc. Based on their frequency of occurrence, we further group the non-GAAP addbacks into five categories and deductions into four categories. We then construct two measures to quantify the extent of discretion employed in defining EBITDA: *Index addbacks* denotes the total categories of non-GAAP items added back to the net income (and takes values from 0 to 5); and *Index deductions* denotes the total categories of non-GAAP deduction (and takes values from 0 to 4). Higher values of *Index addbacks* and *Index deductions* denote greater deviation from the GAAP definition of EBITDA.

We are able to compute *Index addbacks* and *Index deductions* for 3,939 loan packages with EBITDA-based covenants. We find significant heterogeneity in the presence of non-GAAP addbacks and deductions in EBITDA definitions, with the former being more common than the latter. All except 344 loan packages feature at least one non-GAAP addback, the modal number of addbacks is 2, and about 43% of definitions have three or more addbacks. By contrast, 1,121 packages do not have a single non-GAAP deduction, and less than 2% of packages involve 3 or more non-GAAP deductions. “Non Cash expenses” and “Non recurring expenses” are the most frequently found non-GAAP addbacks, whereas “Non-cash Earnings” and “Extraordinary Income” are the most frequently found deductions. There is a significant upward trend in the number of non-GAAP addbacks, especially after 2010; the rate of increase in non-GAAP deductions is comparatively smaller. Overall, these trends highlight the increased importance of this particular dimension of contractual flexibility in the syndicated loan market. Therefore, our paper primarily focuses on the causes and consequences of EBITDA addbacks, although we briefly discuss EBITDA deductions as well.

There are competing hypotheses for why banks use non-GAAP addbacks in EBITDA-based covenants, and these lead to different predictions for the effect of these addbacks on loan performance and borrower performance. On the bright side, one could argue that lead banks use their

private information about borrowers or their specialized industry knowledge to design covenants that better reflect borrowers' true financial health. This can be particularly helpful in case of borrowers with complex operating characteristics or those that are undergoing restructuring. As per this explanation, *Index addbacks* should be either positively related to or unrelated to loan performance and firm performance. On the dark side, it may be that lead banks use non-GAAP addbacks to hide the true financial condition of borrowers from syndicate participants, and possibly from regulators. If so, *Index addbacks* should be negatively related to loan performance and borrower performance. Finally, it may be that non-GAAP addbacks have an adverse causal effect on loan performance and borrower performance by worsening lead banks' incentives to monitor borrowers and by hampering their ability to take timely corrective action. The primary objective of this paper is to isolate this causal effect of non-GAAP addbacks on loan and borrower performance.

We begin our analysis by relating *Index addbacks* to observable borrower and loan characteristics. We find that borrowers of loans with above-median number of non-GAAP addbacks tend to be larger in size, have higher leverage, lower asset tangibility, and worse credit quality (poorer credit rating and lower Z-score) compared to borrowers of loans with below-median number of addbacks. Likewise, for our entire sample period, loans with more addbacks are associated with higher spreads, are for a larger amount, and are of longer maturities. Overall, this evidence indicates that non-GAAP EBITDA addbacks are more likely to be employed in riskier loans to borrowers perceived to be more risky.

To estimate the effect of *Index addbacks* on loan and borrower performance, we exploit the 2013 Interagency Guidance on Leveraged Lending (the guidance from now) to devise an IV regression framework. The guidance put limits on banks' ability to lend to borrowers with Debt/EBITDA greater than 6. In response, we expect banks to increase their usage of non-GAAP addbacks to potentially make bigger adjustments to borrower EBITDA and ensure that the loan conforms to the Debt/EBITDA limit. Formally, we focus on a four year period (two years before and two years after) surrounding the introduction of this guidance, and use a *Post-2013* indicator as our instrument for *Index addbacks*. We show that this instrument satisfies the relevance criterion: all else equal, debt contracts originated in 2013 and 2014 have 0.26 more non-GAAP addbacks compared to debt contracts originated in 2011 and 2012. The key identifying assumption of our

analysis is that the *Post-2013* indicator affects subsequent loan performance only through its effect on non-GAAP EBITDA addbacks (exclusion restriction). That is, we assume that there was no systematic differences in risk characteristics of the loans originated in 2013 and 2014 as compared to the 2011 and 2012 cohort. In support of this assumption, we show that there is no statistically significant change across time in most of the observable borrower or loan characteristics. We find some weak evidence for change in borrower size and loan amount. In abundant caution, we include these as controls in our IV regression.²

Using measures of loan performance from the SNC database, we show that non-GAAP addbacks in EBITDA-based covenants have a strong and adverse effect on long-term loan performance. Our coefficient estimates indicate that with every additional addback, the probability of the loan becoming 60 days delinquent increases by 4.2% within 3 years of origination, which is fairly large compared to the unconditional probability of 1.3% of a loan becoming 60 days delinquent (we find similar effects for the likelihood of becoming 90+ days delinquent). Every additional addback also increases the likelihood of default within the first three years of loan origination by 1.6%, which is substantial compared to the unconditional likelihood of default of 1.1%. We also find similar adverse effects of addbacks on borrower performance. Specifically, each additional addback increases the probability of a rating downgrade for the borrower in the 3-year period following loan origination by 37.5%. The average firm in our sample has the unconditional probability of being downgraded of 27.2%. Therefore, in comparison, our coefficient estimate is economically significant. Similarly, non-GAAP addbacks also increase the likelihood of borrowers experiencing bankruptcy, as proxied by a decline in the borrowers' Altman Z-score in the three-year period following loan origination. This coefficient indicates that each additional addback has the potential to reduce the Z-score from its sample mean value to below 2.289, a value outside of the 'safe zone'. Overall, the results from the IV regression indicate that non-GAAP EBITDA addbacks weaken the efficacy of EBITDA-based covenants and lead to deterioration in long term loan performance and borrower performance.

Interestingly, in our sample, this reduced creditor control is not fully priced into loan agreements. That is, the post-2013 increase in non-GAAP addbacks does not increase the *All in Drawn* spread charged by the lead bank. Thus both the lead bank and the participant lenders are not compensated

²Note that the lack of significant difference also makes it superfluous to include the other covariates as controls in our IV model. In unreported tests we find our results are robust to their inclusion.

for the higher loan risk. Given this, an important question to ask is: Why does the lead bank agree to such customized EBITDA definitions? Perhaps, the answer lies in the development of a liquid secondary market for syndicated loans where lenders can sell their loan shares after origination. We conjecture that lead banks may reduce their monitoring effort (and consequently cost) in loans with such customized EBITDA definitions and the deteriorating loan and borrower performance may themselves be a result of reduced monitoring by the lead bank(s). To test this hypothesis, we use the IV regression framework along with loan ownership information in SNC to examine the effect of non-GAAP EBITDA addbacks on the year-on-year changes in the lead banks' loan share ownership. Consistent with existing theories of moral hazard, we find that non-GAAP addbacks make it more likely that lead banks lower their loan share exposures through secondary market sales. On the extensive margin, each additional addback increases the likelihood of a decline in the lead bank's loan share ownership by 5.8% within the first year of origination. This effect is economically large with respect to the unconditional average likelihood that lead banks lower their loan share exposure in any loan. We further find that the likelihood that the lead bank exits the syndicate within two years after the loan origination increases by 4.5% for each additional addback. On the intensive margin, we find that an additional addback results in a reduction in lead arranger's ownership share by \$1.1 million. This is roughly 6% of the average lead bank share in our sample (\$18.75 million). Due to limited power, the last two results are not statistically significant at conventional levels.

We make a number of contributions to the literature. We are one of the first to introduce a way to quantify the extent to which EBITDA definitions in loan contracts deviate from their GAAP definition. Our results show that our measure is informative and its ease of construction may encourage its widespread use by both regulators and industry participants to understand underlying loan risk. Second, using our IV strategy, we document that *Index addbacks* are associated with worse subsequent loan and borrower performance. Finally we also highlight a potential mechanism for the effect of *Index addbacks* on loan performance – reduced lead arranger monitoring. Our results highlight some of the unintended consequences of regulatory guidance and the ways in which industry participants try to circumvent regulations.

Our paper is closely related to [Badawi and de Fontenay \(2019\)](#) who also focus on the EBITDA clause in loan agreements and examine the determinants of the variation in the EBITDA definitions

across loans. They suggest that some of this variation is motivated by the bank’s desire to make borrower leverage (measured as Debt/EBITDA) opaque, especially after the Fed’s issuance of the Leveraged Loan Guidance. [Jiang \(2021\)](#) examines cost savings and synergy addbacks in loan contracts, and finds that lenders in the leveraged loan market use these addbacks to overstate earnings and hide risks in their bid to reach for yield. [Ganglmair and Wardlaw \(2017\)](#) analyze the level of detail and customization in the defaults and covenants sections of loan agreements, and find that contracts are more detailed when firms are closer to the default boundary and have more complex financial structures. This is accompanied by a stronger incentive to engage in earnings management ([Franz et al. \(2014\)](#); [Fan et al. \(2019\)](#)). Moreover, loans with more detailed clauses are renegotiated more often. We go beyond the evidence in these papers and examine the effect of non-GAAP EBITDA addbacks on subsequent loan performance. Our identification strategy allows us to overcome the confounding effects from underlying borrower risk for this analysis, a potential challenge in earlier studies. By combining Dealscan with the SNC data, we are able to show that non-GAAP EBITDA addbacks have an adverse effect on subsequent loan performance. Moreover, we show that the adverse effects arise because EBITDA addbacks worsen lead arrangers’ incentives to monitor borrowers and encourage them to sell their loan holdings in the secondary loan market.

Our paper is also related to the broader literature analyzing the effects of contractual provisions that weaken covenant enforcement. [Ivashina and Vallee \(2020\)](#) document that carve-out and deductible clauses weaken restrictive covenants in leveraged loan contracts. A more prevalent form of weakened creditor control is through the so called cov-lite loans, which require firms to comply with their financial covenants only if they pursue an active event, such as issuance of additional financing, sale of assets or merger. Some studies link the provision of cov-lite loans to higher likelihood of default ([Demerjian et al. \(2020\)](#)), weaker covenant enforcement, weaker creditor control rights ([Becker and Ivashina \(2016\)](#)) and possible reaching-for-yield under market overheating ([Stein \(2013\)](#)). We instead focus on a widely-used category of financial covenants based on EBITDA, and show how non-GAAP addbacks in the contractual definition of EBITDA weaken creditor control. In particular, we distinguish our research from the studies on cov-lite loans in that we show how even contracts with the so called “maintenance covenants”, could reduce lender protection through a heavily customized construct of the underlying financial ratios.

Our study also complements several studies on earnings-based covenants. These have been shown to be present in debt contracts of borrowers with positive earnings, high profitability, and low volatility (Demerjian (2007)), and especially when accounting information reflects credit risk (Christensen and Nikolaev (2012)). Li (2016) posits that EBITDA-based covenants are motivated by the contracting parties’ desire to ensure covenant violations are unrelated to the firm investment cycle as they find that EBITDA is relatively unrelated to investment cycles. While their inclusion is aimed at facilitating firms in their timely recognition of economic losses following debt issues (Nikolaev (2010)), they have increasingly been deemed as credible signals of hidden risks in leveraged lending (Jiang (2021)). Our paper scrutinizes the EBITDA-based covenants subjectively to shed light on how their very composition may alter their effectiveness.

Finally, our research contributes to the literature that discusses non-GAAP reporting and its implications. Non-GAAP earnings measures are used extensively in executive compensation contracts (Curtis et al. (2021); Guest et al. (2022)), during earnings announcement (Bradshaw and Sloan (2002); Bowen et al. (2005)) and to divert analysts’ attention from GAAP net income (Christensen et al. (2011)). This has implications for real activities, accounting choices (Laurion (2020)), and operating performance (Guest et al. (2022)), and is shown to reduce the rigor in audit quality (Hallman et al. (2022)). We complement the findings of the existing studies by documenting usage of non-GAAP measures in debt contracts and evaluating implications for long-term firm and loan performance.

The rest of the paper proceeds as follows: Section 1 describes the datasets, variable construction and presents descriptive statistics. Section 2 explains our empirical method and outlines the results. Section 3 presents robustness tests. Section 4 concludes and discusses policy implications.

1 Data and Descriptive Statistics

1.1 Data Sources

We obtain data on individual loan contracts from the 2020 extract of Loan Pricing Corporation’s (LPC) Dealscan database. Dealscan provides information on loans made to medium and large-sized

U.S. and foreign firms.³ The loans are financed either by a single lender or by a syndicate of lenders. When the loan is financed by a syndicate, Dealscan allows us to identify the lead arranger(s) for the loan. We also obtain information on loan contract terms such as the total loan amount, yield spread,⁴ covenants, maturity, loan type, loan purpose, presence of security, and syndicate structure details, such as the percentage of the loan retained by the lead arranger.

Covenant information in Dealscan is reported at the level of a loan package, which is a collection of individual loans (or facilities) contracted simultaneously by the borrower and lead arranger. To build our sample, we first extract information on all dollar-denominated loans made by U.S. lenders to U.S. borrowers during the period 1995 to 2019 time period. Out of this, we identify all loan packages that contain a financial covenant based on EBITDA. Common examples include covenants which specify a maximum debt-to-EBITDA ratio or a minimum EBITDA-to-interest coverage ratio to be maintained by the borrower during the tenure of the loan. We also require that the borrower be a publicly-listed firm so that we may be able to search for its credit agreements from public filings. There are 8,488 loan packages that meet these conditions.⁵

Our next task is to obtain the credit agreements underlying these loan packages. The Securities and Exchange Commission (SEC) requires public companies to file copies of all material contracts, along with their financial disclosures. These are typically filed as exhibits in 10-K, 10-Q, or 8-K filings. We try to obtain the underlying credit agreements from BamSEC (www.BamSEC.com), which is a search engine and data extraction tool that focuses on SEC filings. BamSEC compiles SEC filings in an easily searchable PDF format. We first use the borrower’s name and/or ticker symbol to extract all credit agreements filed by the borrower, and then identify the specific agreement

³According to LPC, 70% of the data are gathered from the SEC filings (13-Ds, 14-Ds, 13-Es, 10-Ks, 10-Qs, 8-Ks, and Registration Statements), and the remaining data are collected directly from lenders and borrowers. All public firms and all firms that have public debt outstanding are required to file details of their loans with the SEC. Lenders who may use the Dealscan league tables as a marketing tool also have incentives to voluntarily report their loans to Dealscan.

⁴Specifically, Dealscan provides a variable called “all-in-drawn spread,” which denotes the cost to the borrower per dollar of loan amount withdrawn. The all-in-drawn spread is provided as a basis point spread above LIBOR.

⁵For the period 1995-2019, there are 83,107 loan packages in Dealscan. 30,324 of these have non-missing information on restrictive covenants of which 15,319 loan packages have an EBITDA based covenant. Our sample further reduces to 8,488 packages since we include only public listed firms. We note that an average loan with EBITDA based covenant as in our sample is not riskier compared to an average loan without an associated EBITDA based covenant. This is further supported by previous literature that finds mixed evidence for the association between the use of EBITDA-related measures in earnings-based contracts and measures such as leverage, profitability, size, risk, maturity etc. See [Demerjian \(2007\)](#), [Christensen and Nikolaev \(2012\)](#) and [Li \(2016\)](#) for a detailed discussion regarding EBITDA measures in earning based covenants.

using the deal date mentioned in Dealscan. Out of the 8,488 loan packages with EBITDA-based covenants extracted from Dealscan, we are able to obtain the credit agreements for 4,940 loan packages from this search engine.

We parse these credit agreements to extract definition of one or more of EBIT, EBITDA, Consolidated EBITDA, Consolidated Adjusted EBITDA, EBITDAR. We manually clean the extracted definitions to ensure that they begin and end at the appropriate points. We are able to extract usable definition of EBITDA for 4,112 credit agreements. We use keywords such as “plus”, “sum of”, and “added” to identify addbacks; and keywords such as “minus”, “less”, and “subtracted” to identify the deductions. We itemize all the components that are added back (deducted), and classify these as either GAAP or non-GAAP addbacks (deductions). We provide a detailed description of the constituent items in Section 1.2.⁶

We obtain the loan-participant-time-level data from the Shared National Credit (SNC) Program, which is maintained by the Board of Governors of the Federal Reserve System, the Federal Deposit Insurance Corporation, and the Office of the Comptroller of the Currency. The program obtains confidential information from administrative agent (“agent”) banks on all loan commitments (including term loans and drawn and undrawn lines of credit) exceeding 20 million USD (100 million USD effective January 1, 2018) and shared by at least two (three or more effective January 1, 2018) unaffiliated federally supervised institutions, or a portion of which is sold to two or more such institutions. This includes loan packages containing two or more facilities to the same borrower for the same origination date where the sum exceeds \$20 million. New and existing loans meeting this criteria are surveyed on December 31 each year.⁷ The administrative agent of a qualifying loan is obliged to report, at the end of each year, the commitment held by each participant, the participant’s identity, and more detailed information on the loan. For every reported loan, the data allows us to observe loan performance and also lead arranger’s share at the end of every year over the entire duration of the loan. We use the SNC data set for two purposes: to construct

⁶Our sample reduces to 4112 credit agreements for several reasons which include our inability to identify credit agreements associated with companies that underwent a name change following a merger, for Dealscan loan packages which are amendments to an earlier credit agreement and credit agreements in non-readable pdf format. We note that there is no particular time dimension to the credit agreements we were able match to Dealscan. We further note that loans with credit agreements available on www.BamSEC.com are not risky based on ex-ante observable measures vis-a-vis loans that are not included in our sample.

⁷<https://www.newyorkfed.org/bankingreportingformssshared-national-credits> provides a detailed description of the reporting requirements.

measures of ex-post loan performance; and to track the dynamics of loan share ownership in order to identify sales of loan in the secondary market.

We collect annual financial information for the borrowing firms in our sample from Compustat. We limit our dataset to firms with non-missing information on total assets. This leaves us with 3,939 loan packages and 6,006 loan facilities in our analysis sample.

1.2 Quantifying Non-GAAP EBITDA Addbacks and Deductions

In this section we describe how we quantify the usage of non-GAAP EBITDA addbacks and deductions in loan contracts. In definitions that start with net income, we classify the addbacks corresponding to interest expense, taxes, and depreciation and amortization as GAAP addbacks. All other addbacks are classified as non-GAAP addbacks. Based on their frequency of occurrence, we further classify non-GAAP addbacks into the following five categories: 1) “noncash expenses” (other than depreciation and amortization) which include expenses in connection with options, stock and other equity-level awards under employee incentive plans and any expenses stated under the category of non-cash charges; 2) “non-recurring expenses and cash expenses” include all expenses categorized as cash charges (e.g., retention bonuses or other one time compensation payments made to employees and rent paid in cash), non-recurring expenses, or one-time expenses, as well as any expense or losses classified as extraordinary or related to severance and restructuring; 3) “sale & divestitures” includes any losses or expenses from asset sales, dispositions, divestitures and any discontinued operations; 4) “acquisition-related expenses” include any transaction costs, fees, expenses or losses related to material acquisitions in addition to cost-savings synergies; and 5) “miscellaneous addbacks” include all other non-GAAP addbacks such as unrealized losses or any other losses, expenses or fees. We then define *Index addbacks* as the total categories of non-GAAP items added back to net income to arrive at the definition of EBITDA. *Index addbacks* is a count variable that takes values from 0 to 5, with 0 indicating the absence of any non-GAAP addback and 5 indicating the presence of every category of addback.

We employ a similar methodology to quantify the usage of non-GAAP deductions while defining EBITDA in loan contracts. GAAP definition of EBITDA does not require any items to be deducted

from the net income. Therefore, we classify all deductions as non-GAAP deductions. Based on their frequency of occurrence, we classify these deductions into the following four categories: 1) “noncash income” which includes interest income, tax credits, tax refunds, and deferred/unrealized earnings; 2) “extraordinary/non recurring income” includes any items labeled as non-recurring revenue or earnings; 3) “capital expenditures”; and 4) “miscellaneous” deductions. We then define *Index deductions* as the total categories of non-GAAP item deducted from the net income to arrive at EBITDA. *Index deductions* is a count variable that takes values from 0 to 4. A detailed illustration of this methodology using sample EBITDA definitions is provided in [Appendix C](#).⁸

1.3 Measures of Loan and Borrower Performance

A key focus of our analysis is examining the effect of EBITDA customization on ex-post loan performance. Unfortunately, the LPC Dealscan data is limited to information about loans at origination. Therefore, we link our primary Dealscan data with the SNC dataset to obtain detailed information on loan performance. Please refer to [Appendix B](#) for details on the procedure to link LPC Dealscan data with the SNC data.

Using data from SNC we define the following measures of loan performance after origination: indicator variables which identify whether the payments from the borrower are “30 days past due” (*d30*), “60 days past due” (*d60*), or “More than 90 days past due” (*d90+*); the number of days that payments are past due (*Days past due*); and probability of default as reported by the lead arranger (*Default Prob*). The average loan in our sample has a maturity of approximately four years. Therefore, we measure long-term loan performance over a three year span after loan origination. Unlike the *Index addback* and *Index deductions* measures, the ex-post loan performance measures are constructed at the facility level because each loan within a package is reported separately by the reporting bank.

SNC data also allow us to observe the lead arranger’s share at the end of every year over the

⁸There is no uniformity in how loan agreements specify add-backs and/or the language used in describing them. For example, non-recurring charges and extraordinary expenses are specified as two separate addback items in some contracts. Others mention them under the same item head. In other examples, the phrases one-time, non-recurring and unusual are used interchangeably. This complex nature of add-backs specification requires us to classify similar or related add-back items into broader headers (categories) before counting them.

entire loan duration for every reported loan. On the other hand, Dealscan provides information on the loan share retained by the lead arranger at origination, which is not available in SNC. We use these data to define *Loan Sale*, which is an indicator variable that identifies instances when the lead arranger of the loan has sold its loan share in its entirety. We identify sales of loan shares on a loan-by-loan basis following the procedure in [Irani and Meisenzahl \(2017\)](#). Specifically, we compare the set of syndicate members between two consecutive report dates. In particular, if a lender is a member of a loan syndicate at report date t but not in the same loan syndicate at date $t + 1$, then we record a loan share sale for $t + 1$ (after checking that the loan has not matured by then). We assign *Loan Sale* a value of 1 if at least one lead arranger of a loan (in case of multiple lead arrangers) sells their loan in its entirety within two years after loan origination. Our second measure $\Delta Share$ denotes the change in the lead arrangers’ ownership share within two years after loan origination. For each report date following loan origination, we compare commitment share at two consecutive dates for the lead arranger. We then calculate the change in share between t and $t + 1$. For loans with multiple leads, we compute the average $\Delta Share$ across leads within a loan facility. Finally, we define *Decline in Share* to take a value 1 if the lead arranger’s share in the loan in period $t + 1$ is smaller than the share in t , and a value of 0 otherwise. This measure is also constructed over a two year span following loan origination. Overall, these measures capture the arrangers’ reduced “skin-in-the-game” as they sell a fraction of their stake in the loan after origination.

Lastly, we use the following measures of borrower performance measured over 3-years period following loan origination: change in profitability (ΔROA); change in Altman Z-score ($\Delta Z - score$) proxying likelihood of bankruptcy; and indicator for whether the borrower experiences a rating downgrade (*Downgrade*). For details on variable definition, see [Appendix A](#)

1.4 Descriptive Statistics

We present the histogram of *Index addbacks* in Figure 1(a). As can be seen, non-GAAP addbacks are very common: out of the 3,939 loan packages for which we have information on EBITDA definitions, all but 344 packages features at least one non-GAAP addback. The modal number of addbacks is 2, and about 43% of packages feature three or more non-GAAP addbacks in their

definitions of EBITDA.

In Figure 1(b) we provide the histogram of *Index deductions*. Comparing figures 1(a) and 1(b) it is evident that non-GAAP addbacks are more common than deductions: 1,121 loan packages (28% of all packages) do not feature a single deduction. While the modal number of non-GAAP deductions is 2, less than 2% of loan packages have 3 or more deductions. The greater usage of non-GAAP addbacks compared to deductions suggests that EBITDA definitions used in loan contracts are more likely to overstate the borrowers' true (i.e., GAAP) EBITDA. This is consistent with [Chen et al. \(2021\)](#) who find disclosed non-GAAP earnings to be higher than GAAP earnings for nearly 85% of their sample firms between 2009-2013 and further supported by anecdotal evidence from industry reports (e.g., studies by S&P Global) which we referenced in the introduction.

In Figure 2(a) we present the frequency of occurrence of the various categories of addbacks. We find that noncash expenses (other than depreciation and amortization) are the most common and appear in 2,500 loan packages (63% of our sample), followed by non-recurring expenses which appear in 2,300 contracts (58% of our sample). In Figure 2(b) we present the frequency of occurrence of the various categories of deductions. Extraordinary/non-recurring income (including cash income) is the most frequently used deduction, followed by non-cash earnings.

In Figure 3(a) we plot the time series of the annual average values of *Index addbacks* and *Index deductions* during our sample period. As can be seen, there is a significant upward trend in the usage of non-GAAP addbacks, especially after 2010. Although the usage of non-GAAP deductions has also increased over time, the rate of increase is smaller compared to that of non-GAAP addbacks. This highlights the increased importance of this particular dimension of contractual flexibility in the syndicated loan market. Despite the overall upward trajectory, there is an incremental upward jump in *Index addbacks* in 2013 following the implementation of the guidance. This is evident in Panel B, where we focus on the four years of our sample period and provide the time-series of *Index addbacks*.

In Table 1 we provide the summary statistics of the key variables used in our analysis. The detailed definitions of all variables are provided in Table A1 in Appendix A. While the average number of addbacks in our sample is 2.24, the average number of deductions is 1.14. For the

average firm in our sample, mean value of size (natural logarithm of total assets) is 6.993 which corresponds to the book value of total assets of approximately \$1.09 billion. This is significantly larger than the average firm in Compustat. We find that the average leverage (measured as Total debt/Total assets) of the firms in our sample is 0.278. The firms in our sample also have a higher level of asset tangibility (mean of 0.277) than the average Compustat firm.

We obtain information on firm credit ratings from S&P Capital IQ. We convert the letter rating into an ordinal scale, denoted using the variable *Rating*, which takes a value of 1 for “AAA” rated firms and a value of 22 for “D” rated firms. Hence, lower value of *Rating* denotes a better credit rating. The mean value of *Rating* in our sample is 11.2, which corresponds to a rating slightly worse than “BB+” but better than “BB”, while the median value of *Rating* is 11, which corresponds to a “BB+” rating. The average firm in our sample is profitable with return on assets (*ROA*) of 3.7%, and is far from facing bankruptcy as indicated by the average Altman Z-score of 3.8.⁹ Examining the possibility of rating downgrades, we find that the probability of experiencing a rating downgrade within three years after loan origination is 27.2%. On a similar note, we find that borrowers are also likely to experience a decrease in their Altman Z-score in the years following loan origination.

The next set of variables characterize the loan packages in our sample. The average deal amount in our sample is \$639.22 million, which is smaller than the average deal size in Dealscan. The average loan in our sample has a amount-weighted average loan maturity of 52 months, and amount-weighted average loan all-in-drawn spread of 202 basis points. To prevent outliers from biasing our conclusions, we winsorize continuous variables of interest at the 1% and 99% levels.

We divide our loan sample into two sub samples based on whether *Index addbacks* is higher than or lower than the sample median to provide a univariate comparison of borrower and loan characteristics between these two groups (see columns (1) through (3) of Table 2). Borrowers of loans with above-median number of non-GAAP addbacks tend to be larger in size, have higher leverage, lower asset tangibility, and worse credit quality (poorer credit rating and lower Z-score) compared to borrowers of loans with below-median number of addbacks. Moreover, loans with

⁹The Altman Z-score is based on five financial ratios i.e. profitability, leverage, liquidity, solvency, and activity to predict whether a company has a high probability of becoming insolvent and serves as a measure for the financial distress status of companies in academic studies Altman (2013). A value of 1.23 or less is considered to be a “distress zone”, greater than 2.99 is considered “safe zone” and anything intermediary is a “grey zone”.

above-median number of non-GAAP addbacks are for significantly larger amounts, have longer maturities, and feature higher interest rates compared to loans with below-median number of addbacks. Overall, this evidence indicates that non-GAAP EBITDA addbacks are more likely to be used in risky loans to risky borrowers. In columns (5) through (7) we provide a similar univariate comparison of borrower and loan characteristics between loans with below-median and above-median number of non-GAAP deductions. The differences we uncover are very similar to the patterns we found with non-GAAP addbacks, and indicate that non-GAAP deductions are more likely to be used in risky loans and for risky borrowers.

2 Empirical Results

2.1 Non-GAAP Adjustments and Borrower/Loan Characteristics

We begin our multivariate analysis by examining how the usage of non-GAAP EBITDA addbacks (and deductions) varies with loan and borrower characteristics. Accordingly, we estimate variants of the following regression:

$$Y_{ijt} = \alpha + \beta \cdot X_j + \gamma \cdot X_{i,t-1} + \mu_{industry} \times \mu_t + \mu_{lender} + \epsilon_{ijt} \quad (1)$$

Each observation in the above regression corresponds to a loan package. The dependent variable Y_{ijt} is either *Index addbacks* or *Index deductions*, and the subscripts ‘i’, ‘j’, and ‘t’ denote the borrowing firm, the loan package, and the year of loan origination, respectively. We control for a variety of loan package characteristics (X_j) and borrower characteristics ($X_{i,t-1}$) which we describe in detail below. We include lead arranger fixed effects (μ_{lender}) to control for unobserved heterogeneity across lead arrangers, and industry-year fixed effects ($\mu_{industry} \times \mu_t$) to capture the effect of industry-specific time-varying shocks that may affect the usage of non-GAAP addbacks and deductions. We use the Fama-French 48-industry classification to define industry. The standard errors are robust to heteroskedasticity and are clustered at the industry level.

We include the following loan package characteristics (X_j): natural logarithm of the deal amount, maturity (in months), proportion of secured loans in a package, and indicator variables to

indicate the deal purpose. The borrower characteristics ($X_{i,t-1}$) we include are natural logarithm of total assets to proxy for size, ROA as a measure of profitability, interest coverage, Debt/EBITDA, a speculative grade dummy to identify if the borrower’s credit rating is worse than the investment-grade cutoff of ‘BBB-’, complexity measured as the number of business segments and a dummy for *M&A* activity.

We present the results of this analysis in Table 3. The dependent variable is *Index addbacks* in columns (1) to (3), and *Index deductions* in columns (4) to (6). We note that the sample size drops significantly after the inclusion of the speculative grade dummy in columns (2) and (4) because credit rating information is only available for a subset of borrowers. Consistent with the univariate evidence in Table 2, we find that loans with more non-GAAP addbacks are larger in size, have longer maturities, and are more likely to be secured. Such loans are also associated with less profitable borrowers as indicated by the negative and statistically significant coefficient on ROA. Other borrower characteristics like size and Debt/EBITDA are no longer significant after controlling for the effect of loan characteristics. The positive and significant coefficient on the *Speculative grade* dummy in column (2) indicates that non-GAAP addbacks are more widely used in case of borrowers with poor credit quality. Non-GAAP addbacks are more common in deals involving restructuring such as mergers and acquisitions (*M&A*). Interestingly, as the complexity of the business (proxied by an increase in business segments) grows, EBITDA addbacks increase (although not statistically significant) while we see a reduction in EBITDA deductions. We find similar results with *Index deductions* in columns (4) to (6).

2.2 Non-GAAP adjustments and Loan Pricing

Next, we examine how the loan yield spread varies with *Index addbacks* and *Index deductions* after controlling for all relevant borrower and loan characteristics. To do this we estimate variants of regression (1) with the loan’s *All-in-drawn spread* as the dependent variable, and include *Index addbacks* and *Index deductions* as the main independent variable in addition to the borrower- and loan-level characteristics examined in the previous section. The empirical specification is otherwise identical to that in regression (1).

We present the results of these regressions in Table 4. The positive and significant coefficient on *Index addbacks* in column (1) indicates that, all else equal, lenders charge a higher interest rate on loans with more non-GAAP EBITDA addbacks. However, there is no relation between loan yield spreads and the number of non-GAAP deductions. The coefficients on all other control variables are as expected, and show that the loan yield spread is lower for larger and more profitable borrowers, and is higher for borrowers with poor credit quality and high Debt/EBITDA ratio. The positive relation between loan spread and security is also consistent with prior literature (see [Ivashina \(2009\)](#)).

We note that recent studies have found mixed results on the relation between EBITDA customization and loan spreads. [Badawi and de Fontenay \(2019\)](#) find a positive relationship between loan spreads and their measure of EBITDA permissiveness, but they do not distinguish between non-GAAP addbacks and deductions. On the other hand, [Jiang \(2021\)](#) finds no relation between loan spreads and the usage of cost saving and synergy addbacks, which are the focus of her study. In a similar vein, [Becker and Ivashina \(2016\)](#) find that the cov-lite premium paid by borrowers who refinance covenant-heavy loans with covenant-light loans has dropped close to zero since around 2011. Interestingly, we show in Table 8 that lenders do not get any extra compensation for loans with customized EBITDA definitions. Thus the positive coefficient on *Index addbacks* in Table 4 is from the fact that both Index addbacks and loan spreads are higher for riskier borrowers. This dimension of risk is not adequately captured by the observable control variables we include in the regression.

2.3 Index Addbacks and Loan Performance

The extant literature highlights that financial covenants act as early warning “trip wires” for deterioration in borrower performance, and give lenders the right to renegotiate loans and take corrective actions. Hence, a natural question that arises is: what is the effect of non-GAAP EBITDA addbacks on loan performance and borrower performance? The answer to this question is theoretically ambiguous, and it is empirically challenging to identify the causal impact of non-GAAP addbacks on loan and borrower performance.

Both the theoretical ambiguity and the empirical challenges arise from the endogenous nature of these contractual provisions which banks and borrowers agree to. On the bright side, one could argue that lead banks use their private information about borrowers or their specialized industry knowledge to design covenants that better reflect borrowers' true financial health. This can be particularly helpful in case of borrowers with complex operating characteristics or those that are undergoing restructuring. As per this explanation, *Index addbacks* should be either positively related to or unrelated to loan performance and firm performance. On the dark side, it may be that lead banks use non-GAAP addbacks to hide the true financial condition of borrowers from syndicate participants, and possibly from regulators. If so, *Index addbacks* should be negatively related to loan performance and borrower performance. Finally, it may be that non-GAAP addbacks have an adverse causal effect on loan performance and borrower performance by worsening lead banks' incentives to monitor borrowers and by hampering their ability to take timely corrective action.

Identifying the causal impact of *Index addbacks* on loan performance and borrower performance is made difficult by a serious omitted variables problem. The decision of the extent to which a firm deviates from the standard GAAP norms in defining its EBITDA in a loan agreement is likely to be determined simultaneously with several loan and borrower characteristics unobservable to the researcher. This raises the concern that some omitted risk factors may affect both the usage of non-GAAP addbacks and future loan performance and borrower performance. We exploit the 2013 Interagency Guidance on Leveraged Lending to devise an instrumental variables (IV) regression framework to overcome this challenge and identify the causal effect of *Index addbacks* on subsequent loan performance and borrower performance.

The Interagency Guidance on Leveraged Lending, which came into effect on March 22, 2013, updated and replaced the earlier leveraged lending guidance from 2001. The compliance date for this guidance was May 21, 2013. This guidance outlined high-level principles related to safe and sound leveraged lending activities, and applied to all financial institutions supervised by the OCC, Board, and FDIC that engage in leveraged lending activities.¹⁰ Addressing concerns over the “bright line” approach to defining leveraged loans, the agencies agreed that a financial institution should establish its metrics for defining leveraged loans and include those indicators in its credit

¹⁰The details of this regulatory reform can be accessed at <https://www.occ.gov/news-issuances/bulletins/2013/bulletin-2013-9a.pdf> and <https://www.occ.gov/news-issuances/bulletins/2013/bulletin-2013-9.html>

policies. It recognized EBITDA-based leverage measure as representing a supervisory measure in defining leveraged loans. It suggested that, at a minimum, an institution’s underwriting standards should “red flag” instances where the amount of debt that must be serviced from operating cash flow exceeds 6 times EBITDA.

We assume that the guidance, which made it difficult for banks to lend to borrowers with Debt/EBITDA greater than 6, is likely to result in greater use of non-GAAP addbacks in loan contracts as banks and borrowers apply big adjustments to EBITDA to comply with the new regulatory guidance. Indeed, [Badawi and de Fontenay \(2019\)](#) document an increase in EBITDA permissiveness between 2013-2015, consistent with the issuance of the leveraged lending guidelines pushing parties to expand the definitions of EBITDA ¹¹. Since the effect of this guideline diluted in February 2017, we expect much of the effect to be concentrated within 2 years after the announcement. Accordingly, we define a *Post-2013* dummy which takes the value of 1 for loan packages originated between May 2013 and May 2015 (i.e., two years after the guidelines came into effect), and the value of 0 for loan packages originated between May 2011 and May 2013 (i.e., two years before the guidelines came into effect). We then use *Post-2013* as our instrument for *Index addbacks*. Formally, we estimate the following instrumental variables (IV) regression using 2-stage least squares (2SLS):

$$\textbf{First Stage: } Index_addback_{ijt} = \phi + \tau \cdot Post - 2013_t + \gamma_1 \cdot X_l + \gamma_2 \cdot X_{i,t-1} + \mu_{industry} + \epsilon_{ijt} \quad (2a)$$

$$\textbf{Second Stage: } Y_{ijt} = \alpha + \beta \cdot \widehat{Index_addback}_{ijt} + \gamma_1 \cdot X_l + \gamma_2 \cdot X_{i,t-1} + \mu_{industry} + \epsilon_{ijt} \quad (2b)$$

We expect a positive coefficient on *Post-2013* in the first-stage regression. The dependent variable Y_{ijt} in the second stage regression is one of the following measures of subsequent loan performance: indicator variables for whether the loan is past due by 30, 60, or 90 days (*d30*, *d60* and *d90+*); the number of days the loan is past due; and the probability of default (*Prob Default*). The loan performance variables are measured during the three year period after the loan origination.

¹¹ A closer look at this effect reveals that the upward adjustments in EBITDA following the regulation were more pronounced under three of the five non-GAAP categories. These include acquisition related cost saving synergies, miscellaneous items such as expenses or charges incurred and related to any equity offering, investment, recapitalization or incurrence (or refinancing) etc. and to a certain degree non-cash items. See [Appendix B Table B4](#) for details.

The sample consists of loans in SNC-Dealscan sample matched on exact values of borrower name, lender name, origination date and loan amount (hereafter referred to as the precisely matched SNC-Dealscan sample.). For details regarding the matching algorithm, see [Appendix B](#)).

The key identifying assumption behind the IV model is that the *Post-2013* indicator affects subsequent loan performance only through its effect on non-GAAP EBITDA addbacks (“exclusion restriction”). That is, we assume that there are no other differences in risk characteristics between loans originated during the May 2013-May 2015 period and the May 2011-May 2013 period. While there is no way to evaluate the validity of this assumption, we document a sharp increase in the number of non-GAAP addbacks after the adoption of these guidelines, but fail to find a similar change in other borrower or loan characteristics (see Table 8) except for firm size and deal amount as of origination. This offers us confidence that our exclusion restriction is valid.

We include firm size and deal amount as of origination as controls in our IV regression since they appear to be correlated with our instrument (See Table 8). The lack of significant correlation between our instrument and the remaining observable firm and loan characteristics makes their inclusion superfluous in our IV model. However, in unreported tests we find our results are robust to their inclusion. Finally, we include industry fixed effects to control for unobserved differences across industries. We cannot include year fixed effects or control for industry-specific time-varying shocks due to potential collinearity with our instrument. Standard errors are robust to heteroskedasticity and are clustered at the industry level.

The results of the IV regression are presented in Table 5. The positive and significant coefficient on *Post-2013* in the first-stage regression indicates that, all else equal, loan packages originated during the May 2013-May 2015 period contain 0.584 more non-GAAP addbacks in their EBITDA definitions compared to loan packages originated during the May 2011-May 2013 period. The Kleibergen–Paap Wald F statistics (weak instrument test) for the first stage equation are large, indicating a strong instrument.

Turning to the second-stage results, we find that each additional non-GAAP addback results in a 4.2% higher likelihood of the loan being classified as 60-days delinquent (column (3)); the corresponding increases in probability for being classified greater than 90+days delinquent is 1.6%

(columns (5)). These effects are large in comparison to the unconditional average probabilities of a loan becoming 60, and 90+ days past due of 1.3%, and 0.6%, respectively. For robustness, we re-run these tests on the SNC-Dealscan sample comprising of loans matched on a fuzzy algorithm similar to [Cohen et al. \(2018\)](#) (See details in [Appendix B](#)). We also evaluate loan performance over a 5 year period subsequent to loan origination. All our results are qualitatively similar.

Similarly, the days past due increases by 6.33 days for each additional non-GAAP addback, which is economically significant because the average value of number of days past due in our sample is 2.538. Moreover, each additional non-GAAP addback increases the probability of default by 1.1%, which is also the unconditional probability of default.

Overall, the results in [Table 5](#) indicate that the usage of non-GAAP addbacks leads to deterioration in long-term loan performance.

2.4 Index Addbacks and Borrower Performance

Next, we use the IV regression model to examine how non-GAAP addbacks affect borrower performance after the origination of the loan. The dependent variable Y_{ijt} is one of the following measures of borrower performance measured over the 3-year period following loan origination: ΔROA , $\Delta Z\text{-score}$, and *Downgrade*. The results of these regressions are presented in [Table 6](#).

Examining the second-stage results, we find that the usage of non-GAAP addbacks leads to a deterioration in the borrower’s credit quality in the 3-year period following the loan origination. Specifically, each additional non-GAAP addback lowers the borrower’s *Z-score* by 1.469 and increases the probability of ratings downgrade by 37.5% in the 3-year period after loan origination. Both these effects are economically significant: as we showed in [Table 1](#), in the 3-year period following loan origination, the average decrease in *Z-score* is -0.75, and the average probability of a rating downgrade is 27.2%. On the other hand, we fail to find any evidence that non-GAAP addbacks have a significant negative effect on profitability.

2.5 Index Addbacks and Lead Bank Ownership

Our results so far indicate that non-GAAP EBITDA addbacks are associated with a deterioration in loan performance and the borrowers’s credit quality. In this section we explore some potential channels for these results. It is tempting to think that these effects are driven by lenders using non-GAAP addbacks to hide the true credit risk from syndicate participants and regulators, while they reach for higher yields. However, we find in Table 8 that lenders do not charge a higher All-in-Drawn spread for loans with more index addbacks. This is inconsistent with the index addbacks proxying for borrower risk observable to the lead arranger.

Another possible channel through which non-GAAP addbacks could lead to deterioration in loan performance and borrower credit quality is if they undermine the lead arrangers’ monitoring incentives. This moral hazard hypothesis stems from the development of a liquid secondary market for syndicated loans where lenders can sell their loan shares after origination. Some recent studies have documented that lead arrangers in the leveraged term loan market reduce their loan shares to close to zero within 2-3 months after loan origination (Lee et al. (2019)).¹² Lead share sales occur for almost 11% of loans in the matched Dealscan-SNC sample (Blickle et al. (2020)). Therefore, we hypothesize that non-GAAP addbacks increase the likelihood of loan sales by the lead arranger in the secondary loan market, and a decrease in loan share held by the lead arranger after origination.

To test this moral hazard hypothesis, we estimate the IV regression model with the following variables as dependent variables: *Loan Sale*, a dummy that identifies if the lead arranger sells its entire loan exposure; *Share Decline*, a dummy that identifies instances when the lead arranger decreases its loan exposure after origination; and $\Delta Share$ to denote the magnitude of decrease in the lead arranger’s loan share after origination. These three variables that capture the extensive and intensive margins of lead arranger activity in the secondary loan market are measured over a two year period after loan origination. We also conduct robustness tests (unreported) where we measure lead arranger activity over the three and five year period after loan origination. Our findings are qualitatively similar.

The results of our estimation are presented in Table 7. Examining the second-stage results, we

¹²This is consistent with the fact that many institutional investors, such as CLOs, prefer to buy in the secondary market for tax reasons (See Taylor et al. (2006), p.165)

find that non-GAAP addbacks significantly increase the likelihood that the lead arranger reduces its loan ownership through secondary market sales. Specifically, each additional non-GAAP addback increases the likelihood of *Share Decline* by 5.8% within the first year of loan origination, which is economically large compared to the average likelihood of share decline of 8.1%. We further find that there is a 4.5% likelihood that the lead bank will exit the syndicate with every additional non-GAAP addback. Unfortunately, our result for a complete exit from the syndicate within a two year time frame from origination lacks power. Finally, we find a negative coefficient on *Index addbacks* in the specification with ΔShare as dependent variable, indicating that every additional addback results in a decline in lead share by 1.1 million USD within two years from origination (however not statistically significant). For robustness, we repeat these tests on the SNC-Dealscan sample comprising of loans matched on a fuzzy algorithm (See details in [Appendix B](#)). Our analysis on this sample, shows that for every incremental EBITDA add-back, there is a 12% higher likelihood of loan sale within a five year period since loan origination. All other results are qualitatively similar.

3 Additional Tests

In this section, we perform some additional tests to further substantiate our main findings.

A secular upward trend in Index addbacks is observed since the beginning of our sample period, as shown in [Fig 3](#). We must establish that the increase in addbacks observed in correlation with our instrument is incremental to this trend. To test whether our research design often demonstrates a positive association between our instrument and index addbacks, even outside of the period of regulatory changes, we create several placebo instruments using different treatment periods, following the same approach as the construction of our main instrument (*Post-2013*). In particular, we test three fake treatments i.e., May-2008, May-2009 and Dec-2010. For each of these treatments, we construct *Placebo Instrument* as an indicator coded as 1 for two years succeeding this treatment and 0 for two years prior to the treatment. For example, *Placebo Instrument(May2008)* is an indicator coded as 1 for the period May 2008-May 2010 and 0 for the period May 2006- May 2008. The placebo instrument shares a similar time trend as our *Post-2013 IV*, however it is not exposed to the guidance which came about only in May 2013. If the *Post 2013* instrument was picking up

the time-series changes in the addbacks, then it should also be reflected as an increase in addbacks in the specification with the placebo treatment years. To the contrary, the first stage estimates from a 2SLS IV regression in Table 9 shows (as specified by Equation 2 where we replace *Post-2013* with our *Placebo Instrument*) do not predict any significant increase in addbacks. Columns (1)-(3) correspond to the system of equations measuring the effect of Index addbacks on loan performance. Likewise, columns (4)-(6) correspond to the 2SLSV regressions estimating the effect of index addbacks on borrower performance. In all our tests, we fail to find any significant change in *Index Addbacks* around the fake treatment years. This gives us confidence that the correlation between our measure of addbacks and Post-2013 instrument is capturing the effect of the 2013 leveraged lending guidance on incentives to manipulate EBITDA addbacks.

Next, we investigate if addbacks under specific categories were more critical than others in their effect on adverse long-term loan performance. As indicated by the results Table 10 and Table 11, sales & divestitures and other miscellaneous category related addbacks account for a significant part of the adverse loan performance resulting from non-GAAP addbacks. In particular, add-backs under these two categories include expenses or losses from asset sales, dispositions, divestitures; any reasonable expenses or charges incurred concerning equity offering, investment, recapitalization or incurrence of any indebtedness, amount of any change in the deferred revenue account, any losses on hedging obligations or other derivative instruments, etc.

4 Concluding Remarks and Policy Implications

The 2013 Interagency guidance for leveraged lending was primarily motivated by the tremendous growth in the volume of leveraged credit, driven in part by demand from nonregulated investors. Many banks found themselves holding large amounts of higher-risk commitments when buyer demand had diminished significantly. In addition, debt agreements frequently included features that provided limited lender protection and contained aggressive capital structures. Our paper explores some of the unintended consequences of this guideline.

We examine the effect customized EBITDA definitions in credit agreements on the future performance of loans in the syndicated loan market. We first quantify the extent of customization

using two measures that sum the number of non-GAAP items added back or (deducted) when defining EBITDA in credit agreements. Our main analysis uses the 2013 Interagency Guidance on Leveraged Lending to design an instrumental variables strategy to provide causal evidence on poor ex-post performance for loans with highly customized EBITDA specification in financial covenants. In particular, we show that greater non-GAAP addbacks in EBITDA definition result in worse subsequent borrower and loan performance. We acknowledge that the nature and size of add-back would provide a more comprehensive assessment of the effect of EBITDA customization on loan performance. Unfortunately, the dollar amount of each addback is not explicitly stated in the contract. Therefore, our study is unable to quantify the impact of add-back in that dimension. Overall our results highlight that greater flexibility in EBITDA definitions potentially weaken creditor control in syndicated loans and manifest as poor subsequent performance. We further exploit SNC data on syndicated loans to track the post origination dynamics of loan ownership of the lead arranger. This allows us to scrutinize change in lender’s monitoring incentives as a fallout of reduced lender protection from excessive contractual flexibility. We document that lead arrangers for highly customized EBITDA loans are more likely to reduce their loan share exposure in the syndicate following loan origination. It would be interesting to examine the price at which such loans trade in the secondary market to understand the cost-benefit dynamics for the lead arranger from such sales. However, our research lacks the relevant data to perform such an analysis.

Our investigations may have important implications for the design and implementation of regulatory changes in the market for leveraged loans. We shed light on their intended as well as the unintended consequences for overall financial stability. In an overheated market where investors are necessarily reaching for yield and are willing to forego/weaken control rights to boost yields, regulatory changes such as Debt/EBITDA thresholds in maintenance covenants may prove counter-productive. Based on the wider syndication and diverse incentives of non-bank institutional lenders, optimal contracts between banks and borrowers likely involve fewer monitoring tools and weaker control rights ([Becker and Ivashina \(2016\)](#), [Wang and Xia \(2014\)](#)). Overall, these may increase the lender incentives to game institutions ([Stein \(2013\)](#)) in order to appeal to the investor. Moreover, ensuring the presence of certain covenants in debt contracts may not suffice to mitigate the pipeline risks associated with loan sales in the secondary market. Consequently, such regulation may end

up diverting attention from the qualitative weakness in covenant design and result in a future increase in the proportion of bad loans.

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Table 1: Summary Statistics

This table presents descriptive statistics for the sample of firms from 1995 through 2019. Index Addbacks (Deductions), firm characteristics and loan Characteristics including amount, maturity, spread and proportion secured are summarized for Dealscan loan packages with an associated EBITDA based financial covenant, available corresponding credit agreement and non-missing information on total assets. Loan performance measures such as delinquency ($d30 - d90+$, days past due, default probability and loan ownership measures such as Loan Sale, Share Decline and Δ Share are summarized for the Dealscan-SNC matched sample. For definitions of the variables please see Table A1.

Variables	N	Mean	Std. dev.	Percentile Distribution		
				25 th	Median	75 th
Index Addbacks	3939	2.243	1.249	1.000	2.000	3.000
Index Deductions	3939	1.142	0.845	0.000	1.000	2.000
Firm Characteristics						
Ln(Assets)	3939	6.993	1.603	5.892	6.982	8.070
Leverage	3939	0.278	0.213	0.117	0.249	0.399
Tangibility	3905	0.277	0.239	0.088	0.196	0.405
Debt/EBITDA	3904	2.437	2.810	0.670	1.796	3.260
Interest Coverage Ratio	3560	32.163	77.499	4.516	9.573	20.327
Speculative Grade	1852	0.708	0.455	0.000	1.000	1.000
ROA (as of origination)	3939	0.037	0.096	0.012	0.046	0.084
Δ ROA	3375	-0.018	0.198	-0.049	-0.006	0.027
Z Score (as of origination)	3584	3.758	3.175	1.876	3.133	4.703
Δ Z Score	3046	-0.750	5.601	-1.253	-0.229	0.547
Rating (as of origination)	1852	11.163	2.518	9.000	11.000	13.000
Downgrade	1635	0.272	0.445	0.000	0.000	1.000
Loan Characteristics						
Deal Amount (\$ millions)	3939	639.220	1183.211	100.000	300.00	750.000
Facility Amount (\$ millions)	6006	412.849	718.422	70.000	200.000	500.000
Maturity (months)	3939	51.748	16.775	36.000	60.000	60.000
All in Drawn (bps)	3873	202.229	135.145	120.625	175.000	250.000
Proportion Secured	3939	0.572	0.490	0.000	1.000	1.000
d30	939	0.002	0.046	0.000	0.000	0.000
d60	939	0.013	0.112	0.000	0.000	0.000
d90+	939	0.006	0.080	0.000	0.000	0.000
Day pastdue	877	2.538	18.572	0.000	0.000	0.000
Default Prob	744	0.011	0.048	0.002	0.003	0.007
Loan Sale	939	0.069	0.254	0.000	0.000	0.000
Share Decline	939	0.081	0.273	0.000	0.000	0.000
Δ Share	536	-0.927	14.564	0.000	0.000	0.000

Table 2: Firm and Loan Characteristics by Index Addbacks/Deductions, Univariate Analysis

This table presents a comparison of average firm and loan characteristics across sub-samples based on median cut-off of *Index Addbacks* and *Index Deduction* respectively, during 1995-2019. Columns (1) & (4) (2) & (5)) report mean characteristics for firms with addbacks & deductions below (above) the median value. The sample consists of Dealscan loan packages with an associated EBITDA based financial covenant, available corresponding credit agreement and non-missing information on total assets. The unit of observation is firm-loan package-year. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Index Addbacks			Index Deductions		
	Below p50	Above p50	Diff	Below p50	Above p50	Diff
	(1)	(2)	(2)-(1)	(4)	(5)	(5)-(4)
Ln(Total Assets)	6.435	7.223	0.788***	6.578	7.157	0.579***
Leverage	0.262	0.284	0.022**	0.264	0.283	0.019**
Tangibility	0.307	0.265	-0.042***	0.276	0.278	0.001
Debt/EBITDA	2.156	2.553	0.397***	2.240	2.514	0.274**
Interest Coverage	34.797	31.124	-3.673	33.560	31.627	-1.933
Speculative Grade	0.634	0.730	0.096***	0.649	0.727	0.078**
ROA (as of origination)	0.040	0.035	-0.005	0.036	0.037	0.001
Z Score (as of origination)	4.075	3.629	-0.447***	3.995	3.663	-0.332**
Rating (as of origination)	10.809	11.266	0.458**	10.854	11.259	0.405**
Stock Returns (as of origination)	0.008	0.009	0.002	0.011	0.008	-0.003
Deal Amount	357.499	755.527	398.028***	378.979	742.744	363.765***
Maturity	47.397	53.544	6.147***	47.064	53.611	6.547***
All in Drawn	185.707	209.061	23.354***	188.553	207.633	19.080***
Proportion Secured	0.556	0.579	0.024	0.547	0.582	0.035*
N	1151	2788	3939	1121	2818	3939

Table 3: Borrower & Loan characteristics and EBITDA Addbacks/Deductions

This table reports the results of regressions examining the association between non-GAAP adjustments (Index Addbacks / Index Deductions) and Borrower and Loan Characteristics. We estimate variants of the following regression specification:

$$Y_{ijt} = \alpha + \beta \cdot X_j + \gamma \cdot X_{i,t-1} + \mu_{industry} \times \mu_t + \mu_{lender} + \epsilon_{ijt}$$

The dependent variable in columns (1)-(3) is Index Addbacks and Index Deductions in columns (4)-(6). The unit of observation is firm-loan package-year. The sample consists of packages in Dealscan with an EBITDA based financial covenant during 1995–2020, a corresponding credit agreement and non-missing information on total assets. Loan characteristics (X_j) includes Natural Logarithm of Deal amount and Loan Maturity (in months), the proportion of secured loans in a package and dummies for dealpurpose. Borrower characteristics ($X_{i,t-1}$) includes Natural Logarithm of Total Assets, return on assets (ROA), Interest Coverage Ratio, Debt to EBITDA ratio, dummy for loan with speculative grade status, firm complexity measured as the number of business segments and a dummy for M&A transactions. Variable definitions are provided in Table A1. All specifications include Industry-Year and Lead Arranger Fixed Effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Index Addbacks			Index Deductions		
	(1)	(2)	(3)	(4)	(5)	(6)
Ln(Deal Amount)	0.086*** (0.032)	0.096* (0.051)	0.121*** (0.031)	0.050* (0.026)	0.055 (0.037)	0.059** (0.026)
Maturity	0.005*** (0.001)	0.003 (0.002)	0.005*** (0.001)	0.005*** (0.001)	0.007*** (0.002)	0.005*** (0.001)
Proportion Secured	0.271*** (0.064)	0.170 (0.110)	0.292*** (0.063)	0.108** (0.044)	-0.041 (0.086)	0.113** (0.044)
ROA	-0.991*** (0.338)	-0.626 (0.822)	-1.070*** (0.337)	-0.117 (0.254)	-0.294 (0.537)	-0.129 (0.244)
Ln(Total Assets)	-0.011 (0.025)	0.044 (0.053)	-0.026 (0.027)	-0.030 (0.023)	-0.034 (0.042)	-0.036 (0.024)
Interest Coverage	-0.000* (0.000)	0.000 (0.001)	-0.000 (0.000)	-0.000 (0.000)	-0.001 (0.001)	-0.000 (0.000)
Debt to EBITDA	-0.006 (0.011)	-0.025 (0.023)	-0.004 (0.012)	0.006 (0.009)	0.005 (0.017)	0.006 (0.010)
Complexity	0.002 (0.011)			-0.012 (0.012)		
M&A			0.154** (0.073)			0.085* (0.046)
Speculative Grade		0.514*** (0.133)			0.148* (0.076)	
Constant	1.830*** (0.179)	1.232*** (0.441)	1.438*** (0.156)	0.836*** (0.120)	0.731** (0.300)	0.744*** (0.116)
Industry-Year F.E	Y	Y	Y	Y	Y	Y
Lead Bank F.E	Y	Y	Y	Y	Y	Y
Deal Purpose Dummies	Y	Y	N	Y	Y	N
N	3189	1420	3189	3189	1420	3189
R ²	0.500	0.524	0.493	0.423	0.491	0.421

Table 4: Loan Spread and EBITDA Addbacks & Deductions

This table reports the results of regressions showing association between loan spread (All in Drawn) and non GAAP adjustments (Index Addbacks & Index Deductions).

$$Y_{ijt} = \alpha + \beta \cdot X_j + \gamma \cdot X_{i,t-1} + \mu_{industry} \times \mu_t + \mu_{lender} + \epsilon_{ijt}$$

. The dependent variable is Loan Spread i.e., All in Drawn. Column (1) & (2) include Index Addbacks/ Deductions as the main independent variable respectively. The sample consists of Dealscan loan packages with an EBITDA based financial covenant during 1995–2020, a corresponding credit agreement and non-missing information on total assets. The unit of observation is firm-loan package-year. All the specifications control for loan characteristics (X_j) and borrower characteristics ($X_{i,t-1}$) and include Industry-Year and Lead Arranger Fixed Effects. Detailed variable definitions are given in table A1. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	All in Drawn	
	(1)	(2)
Index Addbacks	8.548*** (2.801)	
Index Deductions		1.407 (3.471)
ROA	-309.137*** (57.672)	-314.296*** (57.032)
Ln(Total Assets)	-13.673*** (4.198)	-13.295*** (4.335)
Interest Coverage	-0.018 (0.048)	-0.015 (0.053)
Debt to EBITDA	5.031*** (1.266)	4.806*** (1.207)
Speculative Grade	16.080*** (4.637)	20.243*** (4.749)
Proportion Secured	59.242*** (8.528)	60.745*** (9.124)
Ln(Deal Amount)	-7.463 (5.224)	-6.659 (5.198)
Maturity	0.260 (0.253)	0.278 (0.246)
Constant	281.606*** (30.858)	291.069*** (33.519)
Industry-Year F.E	Y	Y
Deal Purpose Dummies	Y	Y
Lead Bank F.E	Y	Y
N	1396	1396
R^2	0.759	0.756

Table 5: Effect of Index Addbacks on loan performance, 2SLS IV estimates

This table presents 2SLS IV regression estimates for the effect of non-GAAP EBITDA addbacks on long-term loan performance. The sample consists of loans in the Dealscan-SNC matched sample obtained based on an exact match for borrower name, loan amount and origination date. The unit of observation is firm-loan facility-year. The endogenous outcome variable in the first stage (Column (1)) is Index Addbacks and has been instrumented with a Post-2013 dummy. The first stage results corresponds to outcome variables in columns (2)-(4) and are similar for columns (5) & (6). The Kleibergen–Paap F-stat (weak instrument test) from a 2SLS IV regression is shown below each second stage regression result. The loan performance measures (Column (2)-(6)) are measured within three years following loan origination. Detailed variable definitions are given in table A1. All specifications control for industry fixed effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Index Addback	d30	d60	d90+	Days pastdue	Default Prob
	(1)	(2)	(3)	(4)	(5)	(6)
Post-2013 Dummy	0.584*** (0.099)					
Index Addbacks		0.005 (0.005)	0.042** (0.019)	0.016* (0.009)	6.329** (2.856)	0.011** (0.005)
Ln(Dealamount)	0.140* (0.085)	0.002 (0.002)	-0.013 (0.013)	-0.007 (0.005)	-2.703 (1.611)	-0.004 (0.004)
Ln(Total Assets)	-0.021 (0.070)	-0.001 (0.001)	0.002 (0.007)	0.002 (0.004)	0.989 (0.895)	0.000 (0.002)
Industry F.E	Y	Y	Y	Y	Y	Y
N	411	411	411	411	404	343
F Statistic		34.818	34.818	34.818	36.407	29.434
Specification	First Stage	2SLS	2SLS	2SLS	2SLS	2SLS

Table 6: Effect of Index Addbacks on borrower performance, 2SLS IV estimates

This table presents 2SLS IV regression estimates examining the effect of non-GAAP EBITDA addbacks on long-term borrower performance. The sample consists of Dealscan loan packages with an EBITDA based financial covenant during 1995–2020, a corresponding credit agreement and non-missing information on total assets. The unit of observation is firm-loan package-year. The endogenous outcome variable in the first stage (Column 1) is Index Addbacks and has been instrumented with Post-2013. The first stage results corresponds to the outcome variable in column (2) and is similar for columns (3) & (4). The Kleibergen–Paap F-stat (weak instrument test) from a 2SLS IV regression is shown below each second stage regression estimate. The borrower performance measures (Column (2)-(4)) are measured within three years following loan origination. Variable definitions are given in Table A1. All specifications control for the deal size and firm size and include industry and lead arranger fixed effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	Index Addback	ΔROA	$\Delta Z\text{-score}$	<i>Downgrade</i>
	(1)	(2)	(3)	(4)
Post-2013 Dummy	0.302*** (0.054)			
Index Addback		-0.029 (0.032)	-1.469*** (0.517)	0.375* (0.211)
Ln(Deal Amount)	0.155*** (0.059)	-0.002 (0.007)	0.286 (0.268)	-0.040 (0.064)
Ln(Total Assets)	-0.84* (0.046)	0.003 (0.006)	0.064 (0.155)	-0.006 (0.044)
Industry F.E	Y	Y	Y	Y
Lead Bank F.E	Y	Y	Y	Y
Deal Purpose Dummies	Y	Y	Y	Y
N	848	848	771	403
F Statistic		31.089	26.778	11.407
Specification	First Stage	2SLS	2SLS	2SLS

Table 7: Effect of Index Addbacks on loan ownership, 2SLS IV estimates

This table presents 2SLS IV regression estimates for the effect of EBITDA addbacks on loan ownership of the lead arranger. The sample consists of loans in the Dealscan-SNC matched sample obtained based on an exact match for borrower name, loan amount and origination date. The unit of observation is firm-loan facility-year. The endogenous outcome variable in the first stage (column 1) is Index Addbacks and has been instrumented with a Post-2013 dummy. The first stage results correspond to outcome variables in columns (2)& (3) and are similar for column (4). The Kleibergen–Paap F-stat (weak instrument test) from a 2SLS IV regression is shown below each second stage regression estimate. Loan ownership variables in columns (2) & (4) are measured within two years following loan origination and *ShareDecline* is measured within one year of origination. Variable definitions are given in Table A1. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Index Addback (1)	Loan Sale (2)	Share Decline (3)	Δ Share (4)
Post-2013 Dummy	0.584*** (0.099)			
Index Addbacks		0.045 (0.051)	0.058*** (0.014)	-1.080 (1.153)
Ln(Dealamount)	0.140* (0.085)	-0.020 (0.017)	0.017* (0.008)	-0.179 (0.882)
Ln(Total Assets)	-0.021 (0.070)	-0.016 (0.014)	-0.011 (0.007)	0.030 (0.640)
Industry F.E	Y	Y	Y	Y
N	411	411	411	247
F Statistic		34.818	34.818	12.843
Specification	First Stage	2SLS	2SLS	2SLS

Table 8: Covariate Balance

This table reports the results from a comparison of the levels of borrower characteristics and loan characteristics before-after the introduction of the 2013 leveraged lending guidance. Column (1) represents the mean characteristics for the years 2011-2013 and column (2) corresponds to mean characteristics for the period 2013-2015. The sample consists of packages in Dealscan with an EBITDA based financial covenant during 1995–2020, a corresponding credit agreement and non-missing information on total assets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	<i>Pre-2013</i>	<i>Post-2013</i>	Diff	t-statistic
	(1)	(2)	(2)-(1)	(4)
Ln(Total Assets)	7.452	7.639	0.187*	1.963
Leverage	0.269	0.271	0.001	0.098
Tangibility	0.264	0.262	-0.002	-0.124
Debt/EBITDA	2.264	2.477	0.213	1.241
Interest Coverage	39.687	34.831	-4.856	-0.825
Speculative Grade	0.737	0.676	-0.061	-1.463
Rating	11.268	11.047	0.221	0.977
Deal Amount	729.007	930.346	201.339*	2.433
Maturity	56.453	55.680	-0.773	-0.847
All in Drawn	213.838	202.781	-11.057	-1.196
Proportion Secured	0.537	0.527	-0.011	-0.331
Index Addbacks	2.531	2.790	0.259***	3.550
N	431	495	926	

Table 9: Placebo Analysis

This table presents first stage estimates from the 2SLS IV regression Equation 2 using instruments constructed based on fake treatment periods. The endogenous variable is Index Addbacks and is instrumented with the placebo instrument, constructed as a dummy coded as 0 two years prior to and 1 two years post the placebo treatment years i.e., Dec2010, May2009, May2008. Columns (1)-(3) correspond to 2SLS regressions with loan performance as an outcome, similar to Table 5. Columns (4)-(6) correspond to 2SLS regressions with borrower performance as an outcome, as in Table 6.

Variables	Index Addback					
	(1)	(2)	(3)	(4)	(5)	(6)
Placebo Instrument(Dec2010)	0.082 (0.137)			0.084 (0.067)		
Placebo Instrument(May2009)		0.276 (0.216)			0.180 (0.114)	
Placebo Instrument(May2008)			0.147 (0.181)			0.045 (0.063)
Controls	Y	Y	Y	Y	Y	Y
Industry F.E	Y	Y	Y	Y	Y	Y
Deal Purpose Dummies	N	N	N	Y	Y	Y
Lead Bank F.E	N	N	N	Y	Y	Y
N	283	167	168	675	629	652
F Statistic	0.359	1.644	0.657	1.606	2.486	0.509

Table 10: Effect of Sale&Divestitures Related Addbacks on loan performance, 2SLS IV estimates

This table presents 2SLS IV regression estimates for the effect of Sales & Divestiture related addbacks on long-term loan performance. The sample consists of loans in the Dealscan-SNC matched sample obtained based on an exact match for borrower name, loan amount and origination date. The unit of observation is firm-loan facility-year. The endogenous outcome variable in the first stage (Column (1)) is Sale&Divestitures Related Addbacks and has been instrumented with a Post-2013 dummy. The first stage results corresponds to outcome variables in columns (2)-(4) and are similar for columns (5) & (6). The Kleibergen–Paap F-stat (weak instrument test) from a 2SLS IV regression is shown below each second stage regression result. The loan performance measures (Column (2)-(6)) are measured within three years following loan origination. Detailed variable definitions are given in table A1. All specifications control for industry fixed effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Sales&Divestitures	d30	d60	d90+	Days pastdue	Default Prob
	(1)	(2)	(3)	(4)	(5)	(6)
Post-2013 Dummy	0.169*** (0.047)					
Sales&Divestitures		0.017 (0.019)	0.143* (0.079)	0.054 (0.050)	22.190** (10.309)	0.043** (0.020)
Ln(Dealamount)	0.025 (0.049)	0.002 (0.002)	-0.011 (0.011)	-0.006 (0.007)	-2.454 (1.798)	-0.005 (0.005)
Ln(Total Assets)	0.022 (0.033)	-0.002 (0.002)	-0.002 (0.008)	0.001 (0.005)	0.408 (0.997)	-0.000 (0.003)
Industry F.E	Y	Y	Y	Y	Y	Y
N	411	411	411	411	404	343
F Statistic		12.832	10.860	10.860	13.442	12.662
Specification	First Stage	2SLS	2SLS	2SLS	2SLS	2SLS

Table 11: Effect of Miscellaneous Addbacks on loan performance, 2SLS IV estimates

This table presents 2SLS IV regression estimates for the effect of Miscellaneous non-GAAP EBITDA addbacks on long-term loan performance. The sample consists of loans in the Dealscan-SNC matched sample obtained based on an exact match for borrower name, loan amount and origination date. The unit of observation is firm-loan facility-year. The endogenous outcome variable in the first stage (Column (1)) is Miscellaneous Addbacks and has been instrumented with a Post-2013 dummy. The first stage results corresponds to outcome variables in columns (2)-(4) and are similar for columns (5) & (6). The Kleibergen–Paap F-stat (weak instrument test) from a 2SLS IV regression is shown below each second stage regression result. The loan performance measures (Column (2)-(6)) are measured within three years following loan origination. Detailed variable definitions are given in table A1. All specifications control for industry fixed effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Miscellaneous	d30	d60	d90+	Days pastdue	Default Prob
	(1)	(2)	(3)	(4)	(5)	(6)
Post-2013 Dummy	0.218*** (0.045)					
Miscellaneous		0.013 (0.014)	0.111* (0.059)	0.042 (0.037)	16.885** (7.890)	0.033** (0.013)
Ln(Dealamount)	0.035 (0.049)	0.002 (0.002)	-0.011 (0.010)	-0.006 (0.007)	-2.326 (1.696)	-0.003 (0.004)
Ln(Total Assets)	-0.012 (0.041)	-0.001 (0.001)	0.002 (0.008)	0.003 (0.005)	1.019 (1.122)	-0.000 (0.003)
Industry F.E	Y	Y	Y	Y	Y	Y
N	411	411	411	411	404	343
F Statistic		23.719	18.948	18.948	23.957	17.063
Specification	First Stage	2SLS	2SLS	2SLS	2SLS	2SLS

Figure 1: Distribution of Number of Addbacks and Deductions, fontsize=

The figures shows the histogram for the distribution of index scores for addbacks and deductions in the EBITDA definitions. The index value of '0' in panel (a) corresponds to only GAAP inclusions. The index value of '0' in panel (b) corresponds to no exclusions from EBITDA definition.

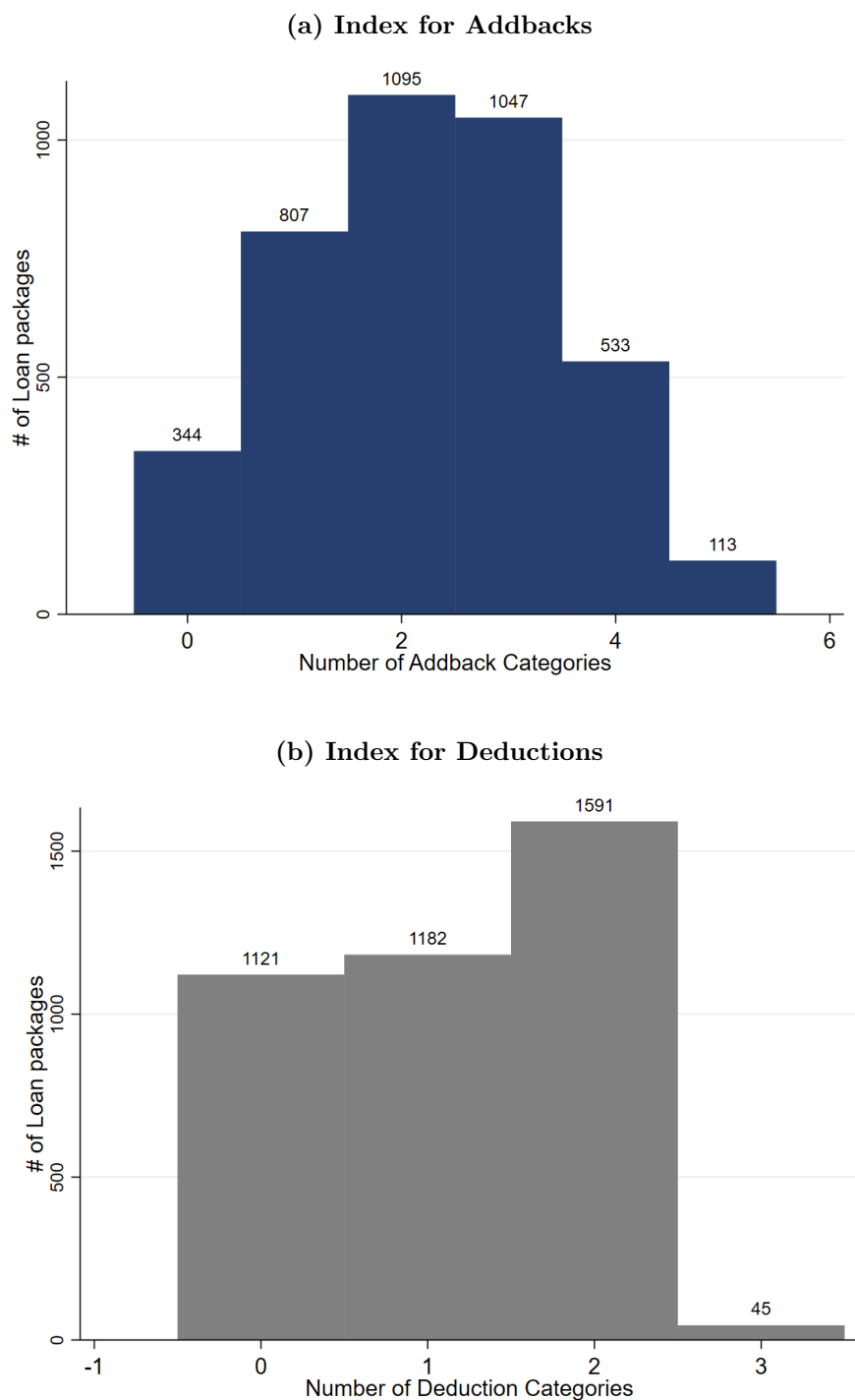


Figure 2: Category-wise Distribution of Addbacks and Deductions

The figures show frequency of non GAAP adjustments (both inclusions (top panel) and exclusions (bottom panel)) in EBITDA definition in loan agreements.

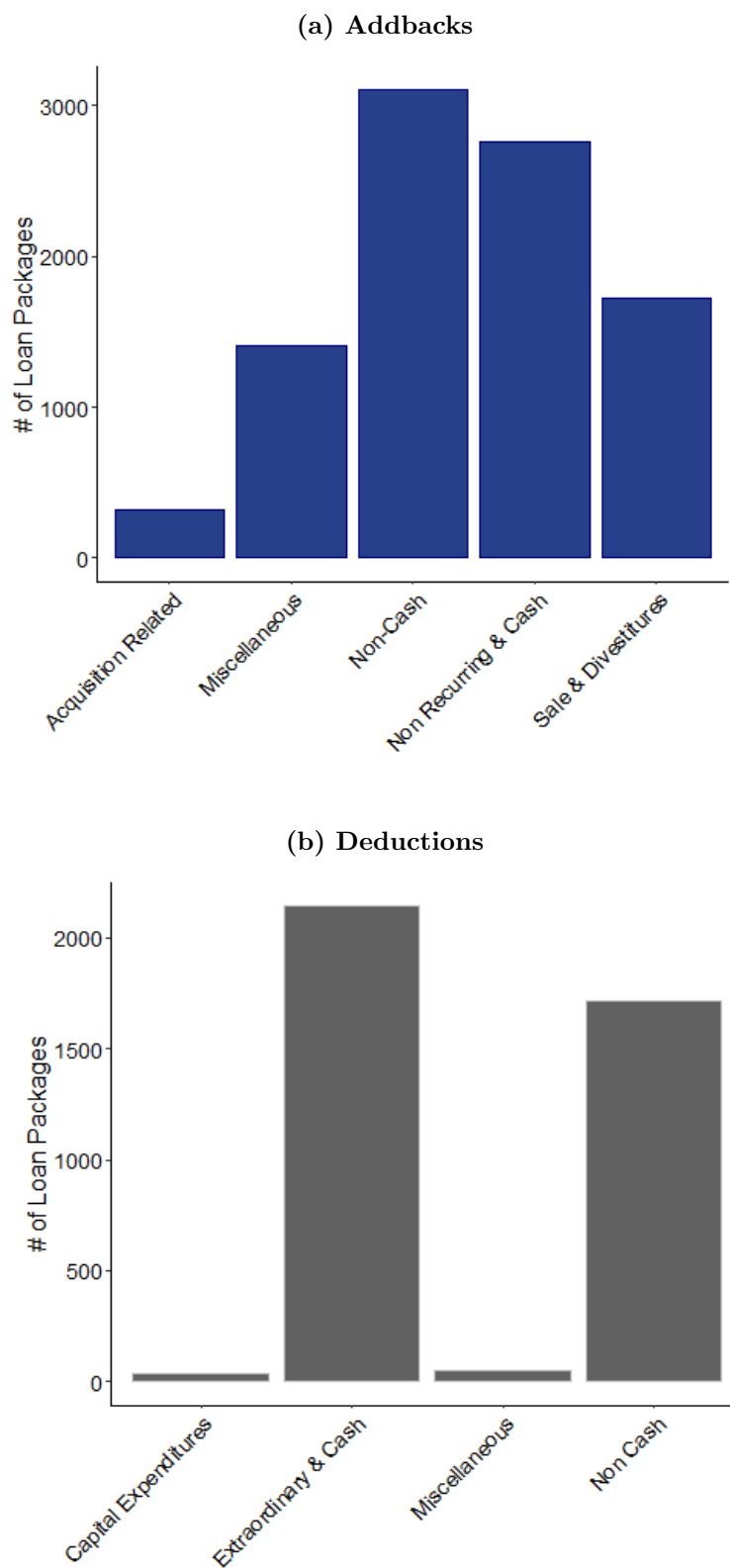
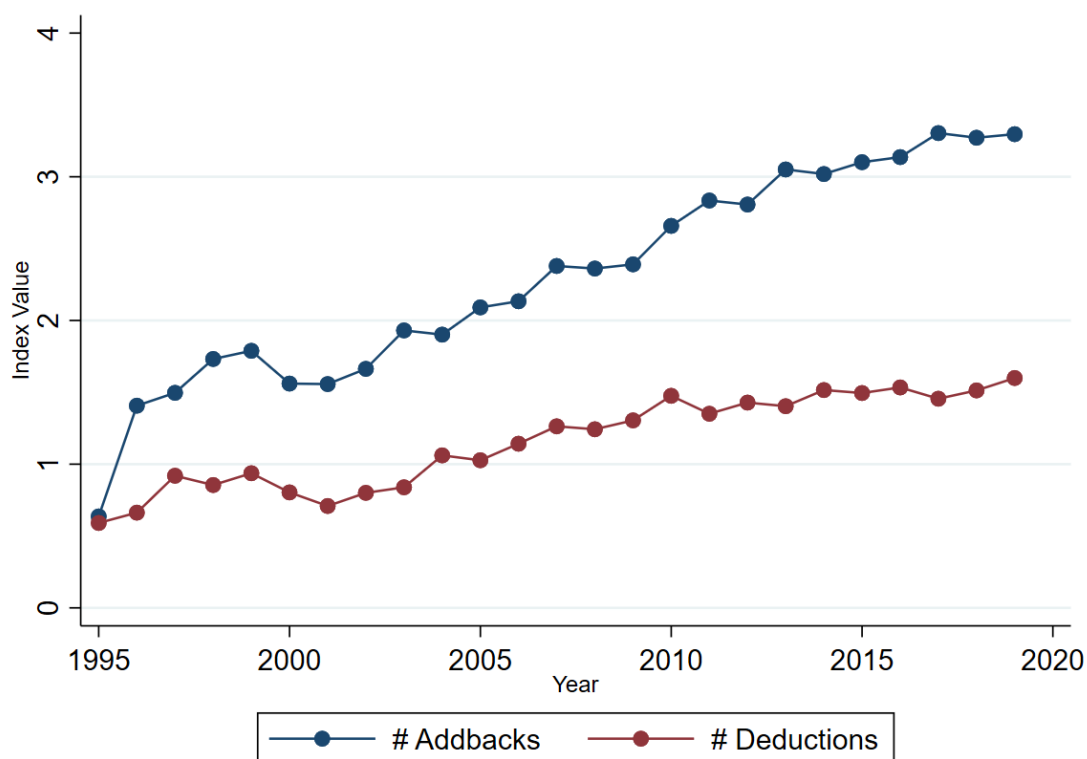


Figure 3: Index by Year

The figure shows the time series for the index of non GAAP adjustments for the period 1995 to 2019. The Blue line corresponds to the number of add-backs and the Red line corresponds to the number of deductions.



Appendix A

Table A1: Variable Definitions

This table provides detailed definitions of the variables utilised across Compustat, Dealscan and SNC datasets.

Variable	Definition
Index Addbacks	Ordinal variable with values from 0 to 5 indicating the # of non GAAP inclusion categories in EBITDA
Index Deductions	Ordinal variable with values from 0 to 4 indicating the # of non GAAP exclusion categories in the EBITDA
Compustat	
Ln(Total Asset)	Natural Logarithm of Total Assets (AT)
Total Debt	Long term Debt (DLTT) plus Short term Debt (DLC)
Leverage	Total Debt divided by total assets (AT)
Tangibility	Net Property Plant & Equipment (PPENT) divided by Total Assets (AT)
Debt / EBITDA	Total Debt divided by EBITDA
Interest Coverage Ratio	EBITDA divided by Interest Expense (XINT)
Rating	Ordinal variable that indicates the S&P long-term credit rating of the firm. The variable is coded as follows: AAA = 1, AA+ = 2, AA = 3, AA- = 4, A+ = 5, A = 6, A- = 7, BBB+ = 8, BBB = 9, BBB- = 10, BB+ = 11, BB = 12, BB- = 13, B+ = 14, B = 15, B- = 16, CCC+ = 17, CCC = 18, CCC- = 19, CC = 20, C = 21, D = 22.
Altman Z score	Estimate of the probability of bankruptcy: $1.2 * (\text{current assets ACT} - \text{current liabilities LCT}) / \text{total assets} + 1.4 * (\text{retained earnings} / \text{total assets}) + 3.3 * ((\text{net income} + \text{interest expense} + \text{income tax expense TXC}) / \text{total assets}) + 0.6 * ((\text{common shares outstanding PRCCF} * \text{share price CSHO}) / \text{total liabilities}) + 0.999 * (\text{sales} / \text{total assets})$.
ROA	Net Income (NI) divided by Total assets
Speculative Grade	Indicator equals 1 if a firm's S&P's credit rating is BBB- or below, and 0 otherwise.
ΔROA	$\text{ROA}[t] - \text{ROA}[t-3]$
$\Delta \text{Z score}$	$\text{Z Score}[t] - \text{Z Score}[t-3]$
Downgrade	Indicator equal 1 if the firm was downgraded in 3 years subsequent to loan origination respectively and 0 otherwise.
Complexity	Number of Business Segments
M&A	Indicator equals 1 if loan is part of M&A deal and 0 otherwise
Dealscan	
Proportion Secured	# secured loans divided by total # secured loans in a package
All in Drawn (bps)	Average value of All in Drawn weighted by within package facility amount
Maturity (months)	Average value of maturity weighted by by within package facility amount
Post-2013	Indicator equals 1 for debt contract signed in May 2013- May 2015 and 0 for the years May 2011- May 2013.
SNC	
Lead Agent	Indicator equals 1 if $RSSD_ID = AGENT_RSSD_ID$
d30	Indicator equals 1 if loan is 30-59 Days past due within 3 years of origination, else 0
d60	Indicator equals 1 if loan is 60-89 Days past due within 3 years of origination, else 0
d90+	Indicator equals 1 if loan is 90+ Days past due within 3 years of origination, else 0
Days past due	Number of days past due within 3 years of origination
Default Prob	Probability of default within 2 years of origination
Loan Sale	Indicator equals 1 if Lead Agent sells entire stake in loan within 3 years of origination, else 0
ΔShare (\$ millions)	Average Δ in <i>Share_Committment</i> for the for Lead Agent over 2 years of origination.
Share Decline	Indicator equals 1 if Lead Agent sells partial stake in loan ($\Delta \text{Share} < 0$) & within 2 years of origination, else 0

Appendix B

Dealcan-SNC Matching Procedure

In order to introduce loan performance and loan sale into our analysis, we merge the loan origination data LPC Dealscan with the loan-participant-time-level data from the Shared National Credit (SNC) Program.. The loans from the Dealscan file are matched to the SNC data using borrower name, lender name original credit amount (COMMITTMENT EXPOSURE AMOUNT), and origination date. There are 6006 unique Dealscan facilities originated between 1996 Q1 and 2019 Q4 with an EBITDA tied maintenance covenant. We were able to find precise (exact) matches for 939 such loans. In addition, a fuzzy matching procedure similar to [Cohen et al. \(2018\)](#) produces an overall match of 2916 loans and a restricted match of 1375 loans. The key difference between the precise match and fuzzy match is as follows. The precisely matched dataset matches on values of borrower name, at least one lender name, origination date and loan amount. The fuzzy match on the other hand uses the following criteria. The first step matches borrower name followed by atleast one lender match. For the subset of loans obtained based on borrower-lender match, we compute the following variables. Origination date distance is the difference between the Dealscan facility start date and SNC origination date in days, loan amount distance is the difference between commitment exposure amount as in SNC and the facility amount as Dealscan, scaled by the dealscan facility amount and finally the gap between the credit type dummmmy. The SNC credits (loans) with the minimum distance in each of the above mentioned critera is identified as a match for the corresponding Dealscan loan. We further narrow our matches by restricting the origination date distance variable to less than equal to 90 days and the loan amount distance variable to less than equal to 0.4. For an average facility amount of \$410 million in Dealscan, this translates to an error margin of \$165 million. For robustness, we have varied this subjective threshold and find qualitatively similar results in all our tests. We compare the Dealscan sample with the SNC-Dealscan matched sample. Table B1 reports the statistics. Comparing it with those of the main sample, we find that the EBITDA non GAAP addback (2.687) and deductions (1.428) are slightly higher in the merged file than in the main Dealscan data sample (2.243 and 1.142 respectively). Firms are slightly larger in the merged file but have smaller leverage and debt to EBITDA ratio compared to

the primary Dealscan dataset. The proportion of speculative grade loans are smaller, have higher profitability and a lower likelihood of bankruptcy as indicated by a larger Z Score. The stock returns are comparable across the two datasets. We cannot conclude anything concrete about the correlation between riskiness and selection into the matched sample from these results from the observable and significant differences between our primary dealscan sample and the SNC-Dealscan merged data.

Table B1: Comparison SNC-Dealscan Merged and Dealscan

This table reports descriptive statistics of our sample which includes firms with an EBITDA based financial covenant during 1995–2020 for which a corresponding credit agreement is available and which had an exact match in the SNC dataset.

	<i>SNC-Dealscan-Merged</i>	<i>Dealscan</i>	Diff	t-statistic
	(1)	(2)	(3)	(4)
Index Addbacks	2.687	2.243	0.444***	10.648
Index Deductions	1.428	1.142	0.285***	10.107
Ln(Assets)	7.715	6.993	0.723***	14.726
Leverage	0.261	0.278	-0.016*	-2.354
Tangibility	0.251	0.277	-0.026**	-3.198
Debt/EBITDA	2.202	2.437	-0.236**	-2.849
Interest Coverage Ratio	39.381	32.163	7.217*	2.341
Speculative Grade	0.650	0.708	-0.059**	-2.633
ROA (as of origination)	0.057	0.037	0.020***	7.100
Z Score (as of origination)	4.025	3.758	0.267*	2.407
Rating (as of origination)	10.714	11.163	-0.449***	-3.851
Stock Returns (as of origination)	0.009	0.009	0.000	0.006
Deal Amount	971.490	639.220	332.269***	7.010
Maturity	56.580	51.748	4.832***	10.553
All in Drawn	182.446	202.229	-19.783***	-5.234
Secured	0.454	0.572	-0.118***	-6.863
N	1029	3939	4968	

Table B2: Effect of Index Addbacks on loan performance, 2SLS IV estimates

This table presents 2SLS IV regression estimates for the effect of non-GAAP EBITDA addbacks on long-term loan performance. The sample consists of loans in the Dealscan-SNC matched sample obtained based on precise match for borrower name and fuzzy match for loan amount and origination date. The unit of observation is firm-loan facility-year. The endogenous outcome variable in the first stage (Column (1)) is Index Addbacks and has been instrumented with a Post-2013 dummy. The first stage results corresponds to outcome variables in columns (2)-(4) and are similar for columns (5) & (6). The Kleibergen–Paap F-stat (weak instrument test) from a 2SLS IV regression is shown below each second stage regression result. The loan performance measures (Column (2)-(6)) are measured within three years following loan origination. Detailed variable definitions are given in table A1. All specifications control for industry fixed effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Index Addback	d30	d60	d90+	Days pastdue	Default Prob
	(1)	(2)	(3)	(4)	(5)	(6)
Post-2013 Dummy	0.511*** (0.123)					
Index Addbacks		0.002 (0.003)	0.028** (0.012)	0.012* (0.007)	4.925** (2.179)	0.019** (0.010)
Ln(Dealamount)	0.215*** (0.076)	-0.000 (0.000)	-0.013 (0.009)	-0.006 (0.004)	-2.590** (1.149)	-0.006* (0.004)
Ln(Total Assets)	-0.073 (0.073)	-0.000 (0.000)	0.004 (0.004)	0.002 (0.003)	1.109* (0.636)	0.001 (0.003)
Industry F.E	Y	Y	Y	Y	Y	Y
N	603	603	603	603	584	500
F Statistic		17.180	17.180	17.180	18.279	17.139
Specification	First Stage	2SLS	2SLS	2SLS	2SLS	2SLS

Table B3: Effect of Index Addbacks on likelihood of loan sale, 2SLS IV estimates

This table presents 2SLS IV regression estimates for the effect of EBITDA addbacks on loan ownership of the lead arranger. The sample consists of loans in the Dealscan-SNC matched sample obtained based on precise match for borrower name and fuzzy match for loan amount and origination date. The unit of observation is firm-loan facility-year. The endogenous outcome variable is Index Addbacks and has been instrumented with a Post-2013 dummy. The Kleibergen–Paap F-stat (weak instrument test) from a 2SLS IV regression is shown below each second stage regression estimate. Loan ownership variables in columns (1), (3) and (5) are measured within two years following loan origination. Likewise, the time span for (2), (4) and (6) is five years since loan origination. Variable definitions are given in Table A1. All specifications include industry fixed effects. Standard errors are robust to heteroskedasticity and are clustered at the industry level, where we define industry at the level of Fama-French (1997) 48-industry categories. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	Loan Sale		Share Decline		Δ Share	
	2yr	5yr	2yr	5yr	2yr	5yr
	(1)	(2)	(3)	(4)	(5)	(6)
Index Addbacks	0.038 (0.047)	0.120* (0.063)	0.176** (0.072)	0.167** (0.067)	-15.438 (15.457)	-10.143 (11.543)
Ln(Dealamount)	-0.019 (0.022)	-0.053 (0.038)	0.012 (0.027)	-0.003 (0.028)	-0.017 (2.467)	2.215 (1.732)
Ln(Total Assets)	-0.013 (0.016)	-0.008 (0.033)	-0.017 (0.019)	-0.023 (0.023)	-3.236 (3.443)	-4.670 (3.834)
Industry F.E	Y	Y	Y	Y	Y	Y
N	603	603	603	603	336	417
F Statistic	17.180	17.180	17.180	17.180	5.603	12.795
Specification	2SLS	2SLS	2SLS	2SLS	2SLS	2SLS

Distribution of Non-GAAP Addbacks, 2011-2015

Table B4: Distribution of Non-GAAP Add-backs around the Regulation

This table reports the distribution of non-GAAP addbacks under various categories around the 2013 Inter-agency leveraged lending guidance. Column (1) represents the proportion of loan packages with a certain category of addback for the years 2011-2013 and column (2) corresponds to proportion of loan packages with the respective category for the period 2013-2015. The sample consists of packages in Dealscan with an EBITDA based financial covenant during 1995–2020, a corresponding credit agreement and non-missing information on total assets. ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

	<i>Pre-2013</i>	<i>Post-2013</i>	Diff	t-statistic
	(1)	(2)	(2)-(1)	(4)
Non Cash	0.845	0.895	0.050*	2.264
Non Recurring & Cash	0.752	0.780	0.028	1.004
Acquisition Related	0.058	0.115	0.057**	3.130
sale & Divestiture	0.499	0.525	0.026	0.801
Miscellaneous	0.378	0.475	0.097**	2.977
N	431	495	926	

Appendix C

Examples of Non-GAAP EBITDA Adjustments

This section illustrates the methodology used to quantify EBITDA addbacks and deductions using sample EBITDA definitions gathered from the repository of credit agreements used in our main analysis.

Consider the following definition in a 2015 \$775 million loan package for Advisor Board Corporation. As a first step, we separate the items added back to consolidated net income using either the phrase ‘plus’ or ‘the sum of’ and those subtracted using the phrase ‘minus’. We further itemize the block of addbacks or deductions using identifiers such as roman numerals ((i), (ii), etc.) or alphabets ((a), (b), etc.) as per applicability. For eg., Example 1 yields (i)-(xviii) total items for addbacks and (i)-(iii) total items for deductions. Next, we work with addbacks by classifying consolidated interest expense, consolidated income tax expense and depreciation and amortization (including charges for impairment of goodwill and other intangible assets.) as standard GAAP adjustments to consolidated net income. This leaves us with the remaining items which are further classified into the following five categories of non-GAAP addbacks using certain keywords as identifiers for each category. In particular, non cash charges, expenses or losses (other than impairment of goodwill or other tangible assets), deferred compensation, stock option or employee benefits based and other equity based compensation expenses are classified as “noncash expenses” (category 1). “non-recurring expenses and cash expenses” (category 2) includes severance, retention bonuses, one time compensation payments to employees of the borrower or of any of its subsidiaries or in connection with a permitted acquisition. Fees, cost and expenses in connection with asset disposition, or any losses or expenses from discontinued operations are classified as “sale & divestitures” (category 3). We further classify losses or expenses in connection with any permitted acquisitions as “Acquisition Related” (category 4). All other addbacks such as unrealized losses in respect of obligations under hedging agreements, other fees, costs and expenses in connection with the transaction for such period are clubbed under the head of “miscellaneous” (category 5). The overall *Index Addback* value for this loan package is 5. We apply a similar methodology for deductions. We start with the block starting with the word ‘minus’. Non cash items of income are

assigned to “noncash income” (category 1). Extraordinary, unusual, or non-recurring cash gains, gains from discontinued operations or in connection with the disposal of discontinued operations and unrealized gains in respect of obligations under hedging agreements are classified under the head of “extraordinary/non recurring income” (category 2). Accordingly, the *Index Deductions* is assigned a value of 2.

Using a similar construct, the definition in Example 2 corresponding to a 2014 loan package for Heartland Payment Systems intended for takeover (deal amount \$775 million) gets an *Index Addback* score of 3 (pertaining to the categories “noncash expenses”, “non-recurring expenses and cash expenses” and “miscellaneous” and *Index Deduction* score of 1 (pertaining to the category “extraordinary/non recurring income”). In Example 3 and Example 4, we demonstrate adjustments to Consolidated EBITDA that produce other versions of this definition including but not limited to EBITDAR and Consolidated Adjusted EBITDA. As mentioned before, we collectively refer to one or more of the following definitions namely EBITDA, Consolidated EBITDA, Consolidated Adjusted EBITDA and EBITDAR as EBITDA. These adjustment introduce two additional non-GAAP adjustments namely rent which is classified under the “non-recurring expenses and cash expenses” category of non-GAAP addbacks and consolidated capital expenditure, which forms category 3 of non-GAAP deductions.

Example 1: Index Addback = 5 & Index Deduction = 2

“Consolidated EBITDA” shall mean, for any period, Consolidated Net Income for such period plus (a) without duplication and to the extent deducted in determining such Consolidated Net Income, the sum of (i) Consolidated Interest Expense for such period, (ii) consolidated income tax expense for such period (including any franchise taxes imposed in lieu of income taxes and any income taxes), (iii) all amounts attributable to depreciation and amortization for such period, (iv) any non-cash charges, expenses or losses (including, but not limited to, impairment of goodwill or other intangible assets and exchange rate losses) of the Borrower or any of its Subsidiaries for such period (excluding any such charges, expenses or losses incurred that constitutes an accrual of or a reserve for cash charges for any future period), (v) any extraordinary, unusual, or non-recurring cash charges or expenses for such period (including without limitation, severance,

retention bonuses or other similar one time compensation payments made to employees of the Borrower or any of its Subsidiaries or made in connection with a Permitted Acquisition), (vi) deferred compensation, stock-option or employee benefits-based and other equity-based compensation expenses for such period, (vii) fees, costs and expenses in connection with the Transactions for such period, (viii) fees, costs and expenses in connection with any investment (including any Permitted Acquisition), asset disposition (including any Asset Sale), issuance of Equity Interests or issuance, modification or refinancing of any Indebtedness for such period, in each case to the extent permitted under this Agreement and whether or not such transaction shall have been consummated, (ix) any losses or expenses to the extent reimbursable by third parties in connection with any Permitted Acquisition for such period, as reasonably determined in good faith by the Borrower, provided, however, that if the Administrative Agent, acting reasonably, determines in such period or the immediately succeeding period that any such losses or expenses, or any portion thereof (which, in each case, were included in Consolidated EBITDA for such period or such immediately preceding period pursuant to this clause (ix)), are no longer reimbursable or are not reasonably likely to be reimbursed, then such losses or expenses, or any portion thereof, shall be subtracted from Consolidated Net Income in calculating Consolidated EBITDA in for such period, (x) unrealized losses in respect of Obligations under Hedging Agreements for such period, (xi) any losses or expenses from discontinued operations or incurred in connection with the disposal of discontinued operations in accordance with GAAP for such period (or if not in accordance with GAAP as otherwise reasonably acceptable to the Administrative Agent), (xii) non-cash charges or amounts recorded in connection with purchase accounting under FASB Accounting Standards Codification Topic 805 (ASC 805), Business Combinations (including any applicable to future Permitted Acquisitions) for such period, (xiii) non-cash purchase accounting adjustments relating to the writedown of deferred revenue (whether billed or unbilled) that are the result of accounting for any acquisition for such period, (xiv) the cumulative effect of a change in accounting principles to the extent permitted by Section 1.02(b) for such period, (xv) any expenses in connection with any litigation or claim involving the Borrower or its Subsidiaries for such period, (xvi) debt discount and debt issuance costs, fees, charges and commissions, in each case incurred in connection with Indebtedness permitted to be incurred under Section 6.01 (whether or not such Indebtedness has been incurred) for such period, (xvii) any losses or expenses incurred by the Borrower or its Sub-

subsidiaries in connection with establishing new or materially expanding existing Healthcare Facilities for a period of 6 months prior to the new establishment or material expansion of such Healthcare Facilities and continuing for 12 months after the new establishment or completed material expansion of such Healthcare Facilities, as reasonably determined in good faith by the Borrower, for such period, not to exceed an amount equal to 25% (or, for any period including or occurring after the fiscal quarter ending December 31, 2017, 20%) of Consolidated EBITDA for the period of four consecutive fiscal quarters most recently ended prior to the determination date (without giving effect to any adjustments pursuant to this clause (xvii)), provided that for any period including or occurring after the fiscal quarter ending March 31, 2018, the aggregate amount of add backs made pursuant to this clause (xvii) and the succeeding clause (xviii) shall not exceed an amount equal to 25% of Consolidated EBITDA for the period of four consecutive fiscal quarters most recently ended prior to the determination date (without giving effect to any adjustments pursuant to this clause (xvii) and the succeeding clause (xviii)), and (xviii) the amount of net cost savings, operating expense reductions, other operating improvements and acquisition synergies projected by the Borrower in good faith to be realized during such period (calculated on a pro forma basis as though such items had been realized on the first day of such period) as a result of actions taken or to be taken in connection with any acquisition, disposition or restructuring by the Borrower or any Subsidiary, net of the amount of actual benefits realized during such period that are otherwise included in the calculation of Consolidated EBITDA from such actions, provided that (A) a duly completed certificate signed by a Financial Officer of the Borrower shall be delivered to the Administrative Agent together with the Compliance Certificate required to be delivered pursuant to Section 5.04(c), certifying that (x) such cost savings, operating expense reductions and synergies are reasonably expected and factually supportable as determined in good faith by the Borrower, and (y) such actions are to be taken within 12 months after the consummation of the acquisition, disposition or restructuring, which is expected to result in such cost savings, expense reductions or synergies, (B) no cost savings, operating expense reductions and synergies shall be added pursuant to this clause (xviii) to the extent duplicative of any losses, expenses or charges otherwise added to Consolidated EBITDA, whether through a pro forma adjustment or otherwise, for such period, (C) projected amounts (and not yet realized) may no longer be added in calculating Consolidated EBITDA pursuant to this clause (xviii) to the extent occurring more than four full fiscal quarters

after the specified action taken in order to realize such projected cost savings, operating expense reductions and synergies, (D) the aggregate amount of add backs made pursuant to this clause (xviii) shall not exceed an amount equal to 20% (or, for any period including or occurring after the fiscal quarter ending December 31, 2017, 10%) of Consolidated EBITDA for the period of four consecutive fiscal quarters most recently ended prior to the determination date (without giving effect to any adjustments pursuant to this clause (xviii)) and (E) for any period including or occurring after the fiscal quarter ending March 31, 2018, the aggregate amount of add backs made pursuant to the foregoing clause (xvii) and this clause (xviii) shall not exceed an amount equal to 25% of Consolidated EBITDA for the period of four consecutive fiscal quarters most recently ended prior to the determination date (without giving effect to any adjustments pursuant to the foregoing clause (xvii) and this clause (xviii)), and minus (b) without duplication to the extent included in determining such Consolidated Net Income (i) any extraordinary, unusual, or non-recurring cash gains and all non-cash items of income for such period, all determined on a consolidated basis in accordance with GAAP, (ii) unrealized gains in respect of Obligations under Hedging Agreements for such period and (iii) any gain from discontinued operations or any gain incurred in connection with the disposal of discontinued operations in accordance with GAAP for such period (or if not in accordance with GAAP as otherwise reasonably acceptable to the Administrative Agent); provided that, in each case, for any period (A) the Consolidated EBITDA of any Acquired Entity acquired by the Borrower or any Subsidiary pursuant to a Permitted Acquisition during such period shall be included on a pro forma basis for such period (assuming the consummation of such acquisition and the incurrence or assumption of any Indebtedness in connection therewith occurred as of the first day of such period) and (B) the Consolidated EBITDA of any Person or line of business sold or otherwise disposed of by the Borrower or any Subsidiary during such period shall be excluded for such period (assuming the consummation of such sale or other disposition and the repayment of any Indebtedness in connection therewith occurred as of the first day of such period).

Example 2: Index Addback = 3 & Index Deduction = 1

“Consolidated EBITDA” means, for any period, for the Borrower and its Subsidiaries on a consolidated basis, an amount equal to Consolidated Net Income for the most recently completed

Measurement Period plus (a) without duplication and to the extent deducted in determining Consolidated Net Income for such period, the sum of (i) Consolidated Interest Charges for such period, (ii) expense for Taxes for such period net of tax refunds, (iii) all FASB ASC Topic 718 expenses for such period, (iv) all amounts attributable to Non-cash Customer Acquisition Costs, (v) all amounts attributable to depreciation and amortization expense for such period, (vi) to the extent expensed and recognized in such period, expenses incurred in connection with the re-financing contemplated by the Existing Credit Agreement in an amount not to exceed \$2,000,000 in the aggregate during the term of this Agreement, (vii) to the extent expensed and recognized in such period, expenses incurred in connection with the Transaction in an amount not to exceed \$4,000,000 in the aggregate during the term of this Agreement and (viii) any extraordinary losses, minus (b) without duplication and to the extent included in Consolidated Net Income, any extraordinary gains and minus (c) any Customer Acquisition Costs, all calculated for the Borrower and its Subsidiaries on a consolidated basis in accordance with GAAP. For the purposes of calculating Consolidated EBITDA for any Measurement Period, pursuant to any determination of the Consolidated Leverage Ratio or the Consolidated Fixed Charge Coverage Ratio, (x) the Consolidated EBITDA attributable to any Equity Interests of, or any assets comprising a division or business unit or a substantial part of all of the business of, a Subsidiary of the Borrower Disposed of during such Measurement Period to the extent that such Disposition would require discontinued operating reporting under GAAP shall be excluded from the calculation of Consolidated EBITDA as if such Disposition and the repayment of any Indebtedness in connection therewith occurred on the first day of such Measurement Period, and (y) the Consolidated EBITDA attributable to any Person, division or business unit acquired by the Borrower or any Subsidiary pursuant to a Permitted Acquisition during such Measurement Period shall be included in the calculation of Consolidated EBITDA as if such Permitted Acquisition occurred on the first day of such Measurement Period, giving effect only to such pro forma adjustments as are permitted by SEC Regulation S-X.

Example 3: Index Addback = 5 & Index Deduction = 3

“Consolidated EBITDA” means, for any period, for the Borrower and its Subsidiaries on a consolidated basis (inclusive of the acquired operations of Brinderson, on a Pro Forma Basis), an amount

equal to Consolidated Net Income for such period plus (a) the following to the extent deducted in calculating such Consolidated Net Income: (i) Consolidated Interest Charges for such period, (ii) the provision for federal, state, local and foreign income taxes payable by the Borrower and its Subsidiaries for such period, (iii) depreciation and amortization expense for such period, (iv) non-cash stock based compensation expense for such period, (v) transaction costs (not including any costs that will be capitalized) in respect of the Brinderson Acquisition in an aggregate amount not to exceed (x) \$7,000,000 for the Borrower and (y) \$19,000,000 for Brinderson pursuant to the Brinderson Acquisition, (vi) to the extent incurred on or before June 30, 2014, any net loss from the discontinued operations of Bayou Welding Works in an aggregate amount not to exceed \$6,500,000 for any four fiscal quarter period, and (vii) other non-recurring expenses of the Borrower and its Subsidiaries reducing such Consolidated Net Income which do not represent a cash item in such period or any future period and minus (b) the following to the extent included in calculating such Consolidated Net Income: all non-cash items increasing Consolidated Net Income for such period, all as determined in accordance with GAAP and without duplication of any other income statement items used in calculating Consolidated EBITDA on a Pro Forma Basis.

“Consolidated Adjusted EBITDAR” means, for any period, for the Borrower and its Subsidiaries on a consolidated basis (inclusive of the acquired operations of Brinderson, on a Pro Forma Basis), an amount equal to the sum of (a) Consolidated EBITDA for such period plus (b) rent and lease expense for such period minus (c) Consolidated Capital Expenditures for such period minus (d) Consolidated Taxes for such period, all as determined in accordance with GAAP.

Index Addback = 3, Index Deduction = 2

“Consolidated EBITDA” means, for any period, for the Borrower and its Subsidiaries on a consolidated basis, an amount equal to Consolidated Net Income for such period plus the following to the extent deducted in calculating such Consolidated Net Income: (a) Consolidated Interest Charges for such period, (b) the provision for federal, state, local and foreign income taxes payable for such period, (c) the amount of depreciation and amortization expense for such period, (d) extraordinary and nonrecurring losses, (e) non-cash stock compensation expenses in accordance with Accounting Standards Codification 718, (f) one-time costs and expenses incurred in con-

nection with Permitted Acquisitions (in cases other than the Byrne Acquisition, not to exceed \$500,000 in the aggregate during any twelve month period) to the extent such costs and expenses are incurred no later than ninety days after the consummation of the applicable Permitted Acquisition, (g) non-cash impairment charges or write-offs or write-downs related to intangible assets, long-lived assets and other non-current assets, (h) charges associated with fair value adjustments relating to contingent earn-out consideration for Permitted Acquisitions and (i) charges associated with stock consideration issued in connection with the Byrne Acquisition minus, to the extent included in calculating Consolidated Net Income, (i) extraordinary and nonrecurring gains, (ii) gains associated with fair value adjustments relating to contingent earn-out consideration for Permitted Acquisitions and (iii) gains associated with stock consideration issued in connection with the Byrne Acquisition.

“Consolidated Adjusted EBITDA” means, for any period, for the Borrower and its Subsidiaries on a consolidated basis, an amount equal to the sum of (a) Consolidated EBITDA for such period minus (b) Consolidated Capital Expenditures for such period minus (c) income taxes paid in cash during such period.