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Universidade do Minho
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Do *Earnouts* Create the Right Incentives?: Earnings Management Around *Earnout*-Based Acquisitions

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ABSTRACT

We investigate whether acquiring firms with earnout agreements engage in earnings management during the earnout period. Using a sample of completed deals between 1998 and 2017, we find that acquirers manage their earnings downwards during the earnout period to avoid or reduce the earnout payment to the target. We also show that lower earnout payments are associated with greater earnings manipulation. Moreover, only earnout deals with a first payment in cash are associated with income decreasing earnings management through real activities. Our findings also indicate that acquirers are more likely to engage more in real earnings management than accrual-based earnings management during the earnout period.

JEL: G30, G34.

Keywords: Earnouts, Mergers and Acquisitions, Earnings Management, Contingent Payments.

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1. Introduction

Earnouts can be simply defined as a risk-allocation mechanism used in mergers and acquisitions (M&As). A portion of the acquisition payment is deferred and determined based on the performance of the acquired business or the combined firm over a specified period following the closing. In deals that include earnouts, there is typically an upfront payment in cash, stock, or a combination of both, and one or more additional payments, of similar or different types, made during or at the end of the earnout period.

Contingent payments, such as earnouts, can be a useful tool for reducing the cost of adverse selection in deals with higher levels of uncertainty about potential realized synergies and larger information asymmetry between bidders and targets. By accepting earnout-based deals, sellers not only demonstrate confidence in the good prospects of the combined firm, but are also willing to put some "skin in the game", which may resolve potential pre-deal valuation disagreements between bidders and targets (Datar et al., 2001; Cain et al., 2011; Cadman et al., 2014) For example, a target firm in the pharmaceutical industry may still be awaiting approval for a new drug at the time of the deal. Even if the target's management is confident in the approval, it may be difficult to convince the bidder. Thus, the target estimates a sell price considering the sales of the new drug, but the bidder may be reluctant to do so. Including an additional payment dependent on the approval or on a sales threshold may solve the problem.

Prior studies on the use of earnout payments in acquisitions have found that this type of payment is an effective tool for closing the valuation gap between bidders and targets, and not surprisingly, earnouts are more prevalent in deals with higher uncertainty about the target value and the future prospects of the combined firm (Cain et al., 2011; Kohers and Ang, 2000; Ragozzino and Reuer, 2009). Deals involving contingent payments also tend to deliver higher returns to acquirers when compared to deals paid in full upon completion (Kohers and Ang, 2000; Barbopoulos and Sudarsanam, 2012; Barbopoulos and Adra, 2016; Barbopoulos et al., 2017).

Although appealing in theory, earnouts are not very common in practice. Bates et al. (2018) report that 9.97% of U.S. acquisitions completed by public acquirers between 1998 and 2014 included earnouts as a form of payment; in a broader international sample, (Viarengo et al., 2018) report that 8.92% of deals include an earnout clause. In our sample, 10.15% of the transactions include a contingent payment in the form of an earnout.

The use of earnouts is not straightforward and may present some challenges[3]. Earnouts should be well understood by both parties, be clear in the measures of the underlying events that lead to their payment, and as much as possible, be based on objective variables that are less prone to discretionary variations. As pointed out by Viarengo et al. (2018), earnouts, which may have originated from a disagreement, may also lead to conflict. Setting up the acquisition payment on

[3] See internet appendix for examples of earnout contracts.

a contingent basis may induce the acquirer to engage in manipulation practices to bring down post-deal earnings below the trigger point and avoid the full payment of the acquisition.

In this study, we aim to answer several questions: (i) do acquiring firms engage in accrual-based or real earnings management during the earnout period to bring earnings below the earnout threshold and avoid future payments to target shareholders? (ii) Does the size and period of the earnout matter for the practice of earnings management? (iii) Does giving stock to target shareholders as an upfront payment reduce the incentives to engage in earnings management post-deal?

As earnout payment triggers are conditional on reaching certain business objectives measured by accounting variables (Cain et al., 2011), managers in control of the combined firm post-acquisition have a strong incentive to avoid or reduce the contingent payment and engage in earnings management to mask the accounting figures. In controlling acquisitions of public targets or in acquisitions of private targets, bidder managers gain full control of the combined firm and are ultimately responsible for managerial decisions and the financial information disclosed by the firm post-acquisition. Their incentive to avoid reaching the earnout trigger and paying the target shareholders may lead them to manipulate earnings downwards post-deal, throughout the earnout period, which should be reflected in the consolidated accounts of the combined firm.

Bidder managers, however, face a trade-off if they attempt to manipulate earnings downwards to reduce the chance of paying the earnout in full. The risk of litigation and monitoring by target shareholders may deter management from engaging in such practices, especially when they can be more easily detected from accounting. During the earnout period, the seller usually closely monitors the performance and accounting practices of the target firm, so the risk of litigation may discourage the acquirer's management from engaging in earnings manipulation or from putting less effort into meeting the earnout payment. Using managerial discretion over accruals to manage earnings, instead of doing so through real activities, may raise the trade-off cost that bidder managers face. Roychowdhury (2006), following Graham et al. (2005) survey, shows that financial executives prefer to use real activities than accruals to report the desired level of earnings because real earnings management is less likely to be detected by auditors than accruals, which are bounded by Generally Accepted Accounting Principles (GAAP). In fact, under stricter regulatory and monitoring environments, managers show a preference for real rather than accrual-based earnings management (Cohen et al., 2008; García Lara et al., 2020). Additionally, real earnings management may have a long-lasting effect – activities undertaken in the current period are not only likely to affect current earnings, but also earnings in future periods[4]. For example,

[4] Several studies show that real earnings management create greater impacts than accrual-based earnings management – e.g., Cohen and Zarowin (2010) show that earnings management prior to a seasoned equity offer increase the risk of a stock price crash; the impact being greater when the manager engages in real rather than accrual-based earnings management. Similarly, Alhadab et al. (2015) for a sample of U.K. IPOs

increasing prices or tightening credit conditions to decrease current sales and avoid an earnout payment may lead to a loss of customers that is hard to recover in the future. Thus, real earnings management can be more effective than accrual-based earnings management in avoiding the contingent payment. A real activity undertaken at a point in time to reduce earnings will have an impact throughout the earnout period, which may be a more suitable action since earnout agreements may either require a single payment at the end or partial payments throughout the earnout period.

The literature on earnings management and M&As with earnout payments is almost nonexistent. A notable exception is Elnahas et al. (2017) whose purpose is to show that using earnouts in M&As violates Islamic law since these agreements feed on uncertainty and may distort managers' incentives with negative consequences for shareholders. Although the authors acknowledge that most earnouts deals involve the acquisition of private targets, they only focus on a small sample of acquisitions of public targets that continue to operate independently post-acquisition and for which it is possible to trace their post-financial performance. This means that controlling acquisitions of public targets, i.e., when the target firm is integrated in the combined company and the accounts are consolidated are also excluded. Their main findings suggest that target managers manipulate earnings one year post-acquisition to extract higher rents with harmful consequences for shareholders' value in the long-run. They suggest that the use of earnouts creates agency problems, which make these contingent payments unfit under Islamic law and should not be used for domestic or cross-border deals involving Islamic firms.

In our study, we take a different approach and focus on the bulk of M&As where the use of earnouts is more prevalent, namely acquisitions of private targets and controlling acquisitions of public targets. In both cases, the managers in charge and ultimately responsible for the company's accounts post-acquisition are predominantly the bidder managers. Since the threshold that triggers the earnout payment is usually based on accounting measures (Cain et al. (2011), there is an incentive for managers to avoid or reduce the contingent payment through earnings management. Our main hypothesis in this paper is that managers of the combined firm will engage in downwards earnings management (particularly through real activities) to reduce the chance of paying the earnout in full.

Using a unique sample of 517 U.S. controlling acquisitions with earnout agreements from 1998 to 2017, where targets are either private or public, and a control sample of 3,928 deals, we show that earnout deals have higher levels of income decreasing earnings management. Managers engage mainly in real earnings management by increasing discretionary expenses, and when the earnout period is longer than one and a half years. In earnouts with shorter periods (less than one

find that real earnings management is more associated with IPO failure risk (i.e., lower survival rates) than accrual-based earnings management.

and a half years), there is evidence of earnings management mainly through accruals, as they are likely to be more effective in reducing the earnout payment in the short term.

We further explore whether some deal characteristics, such as the type of up-front payment made in earnout deals, affect the practice of earnings management. We conjecture that when the first payment is made in stock, there will be less downward earnings management during the earnout period. First, because if target shareholders receive stocks from the acquiring company, they will have not only the incentive but also the power to closely monitor the managers of the combined firm, increasing the potential risk for litigation. Second, in stock-based acquisitions, bidder managers engage in aggressive upward accrual-based earnings management prior to the deal (e.g., Erickson and Wang, 1999; Botsari and Meeks, 2008; Louis, 2004; Gong et al., 2008; Loureiro and Silva, 2021), which tends to revert to the mean post-acquisition; in such cases, engaging in negative accrual-based earnings management after the deal would also increase the litigation risk considerably. Our findings confirm our prediction that when the up-front payment is made in stock, managers do not manipulate earnings downward during the earnout period. In contrast, when the first payment is made in cash, managers do indeed manage earnings downwards through real activities to influence the earnout payment.

Our study contributes to the literature in several ways. First, we contribute to the literature on M&As with earnout agreements. Although the use of such arrangements has been referred to in the literature as a potential source of agency problems between acquirers and sellers (e.g., Cain et al. (2011), Datar et al. (2001), Lukas et al. (2012), Viarengo et al. (2018)), we are the first to empirically examine the effect of using earnout clauses in M&A deals on earnings management behavior by the acquiring firm during the earnout period. We also shed some light on which deal and earnout contract characteristics are more likely to influence the practice of earnings manipulation in its different forms. This result has some important policy implications as it helps sellers understand what deal conditions are more likely to protect their interests against potential misconduct of the managers in charge of the combined firm. Additionally, we expand the literature on earnings management around market transactions in general, and M&As in particular, which has so far mainly focused on how managers use accruals to inflate earnings prior to stock-for-stock acquisitions (Erickson and Wang, 1999; Botsari and Meeks, 2008; Louis, 2004; Gong et al., 2008). Instead, we test both accruals and real earnings management and provide evidence that managers also use real activities to deflate earnings, especially in situations where the litigation risk is higher as it is the case of earnout agreements.

2. Earnout Agreements: Background

Earnout contracts, established between bidders and targets, typically divide the acquisition payment into two parts: an upfront payment, and one (or more) additional contingent

payments, which depend on the future realization of a pre-defined goal[5]. Studies on earnouts date back to the mid-1980s and show that these deals became more popular in the following decade, with the percentage of acquisitions involving earnouts out of total deals increasing from 1.3% in 1985 to 3.5% in 1998 (Bruner and Perella, 2004). After declining in popularity in the early 2000s, earnouts regained popularity following the dot-com bubble burst and have continued to increase in use.

Earnout agreements are particularly relevant when there is a large valuation gap between bidders and targets regarding the acquisition prospects. By breaking down the acquisition payment into fractions and including state-contingent payments (linked to future performance), earnouts can bridge the gap between buyers and sellers and facilitate the completion of deals that are surrounded by uncertainty and information asymmetries between parties (Kohers and Ang, 2000). Without earnout arrangements, some deals may be abandoned as bidders walk away if the perceived risk of overpaying for the target is high (Datar et al. 2001). The cost for the economy could be relevant as some value-creating deals would be left out. Not surprisingly, many studies show that earnouts tend to be more commonly used when target firms are from industries that invest more in intangible assets, such as high-tech or service industries. Kohers and Ang (2000) report that deals involving targets that belong to a high-tech industry are 70% more likely to include earnouts than deals in other industries; also, deals within the services sector are 86% more likely to use earnouts than deals in non-services sectors.

The use of earnouts is also more attractive when acquirers target private firms. Measuring the value of private firms may be quite challenging due to weaker quality of financial information and higher levels of information asymmetry. State-contingent payments may be a useful tool to resolve potential valuation disagreements about private firms in M&A deals. In fact, Ewelt-Knauer et al. (2021) report that 92% of targets in earnout deals are private firms.

The most typical earnout periods range from 1 to 3 years (but can be as long as 15 years, as in our sample). Several factors may influence the length of earnout period. Longer earnout periods are expected in industries where valuation uncertainty is more severe and takes more time to be resolved, as it is the case of R&D-intensive industries (e.g., pharmaceutical). In contrast, earnouts periods tend to be shorter when the expected returns in the target industry is more uncertain, as targets are more reluctant to bear the additional risk of a longer earnout period (Cain et al., 2011).

A key aspect in negotiating earnout arrangements is the amount of the differed payment. Naturally, the proportion of the different payment tends to be larger the higher is the uncertainty about the target value. More skeptical bidders, trying to avoid overpayment, will prefer to "wait

[5] Usually, the earnout threshold is associated with firm performance, such as sales, cashflows or earnings, but it can also be linked to stock or commodity prices, or regulators approvals (as it is often the case of acquisitions involving targets from the pharmaceutical industry).

and see" if what the seller claims to be worth is actually true. Additionally, targets will accept a higher relative earnout size if it's (overly) confident on its future performance (Kohers and Ang, 2000). On average, the amount of earnout payments is about 30% of the total deal value (Bates et al., 2018; Barbopoulos et al., 2017), but it may vary quite significantly – in rare cases the full deal value can be set up as a contingent payment. Other factors, such as bidder financial constraints may also affect the magnitude of the earnout payment. For instance, Bates et al. (2018) show that acquirers with limited access to external capital are more likely to use earnouts as mean of payment..

Although the use of earnout contracts facilitates the completion of acquisitions by resolving valuation discrepancies between bidders and targets, it can also create new agency problems in the post-acquisition period when the earnout contract is in place. Since the earnout triggers are commonly based upon financial measures (e.g., sales and earnings), managers may be tempted to engage in earnings management to influence the earnout payment (Ragozzino and Reuer, 2009; Eckbo, 2009; Lukas et al., 2012; Viarengo et al., 2018). Not to say that the parties involved in M&As with earnout payments are not aware of these potential distortions. For example, Prencipe and Viarengo (2022) show that sellers care about the quality and reliability of the acquirers' past earnings. Certainly, companies can mitigate the managerial misbehavior to influence the outcome of a contingent payment through auditor monitoring. For instance, Allee and Wangerin (2018) show that earnout objectives based on accounting figures are more commonly used when the acquirer's auditor is one of the Big 4 auditing firms. Nevertheless, these mechanisms do not fully prevent managers from engaging in earnings management to affect the outcome of an earnout contract. A study by Elnahas et al. (2017) shows that the use of earnouts in acquisitions of public targets that remain as subsidiaries post deal is associated with earnings manipulation by the subsidiary to reach the threshold that triggers the payment of contingent part.

In this study, we answer some of the questions of previous studies and expand the extant literature by analyzing whether and in what circumstances (e.g., the length of the earnout period, the sellers' ability to effectively monitor) the use of earnouts in M&As creates incentives in bidding managers to manipulate earnings downwards post acquisition to avoid the contingent payment.

3. Sample, Data, and Methodology

3.1. Sample and Data

Our main sample is composed of completed U.S. M&A deals that include an earnout clause occurring between 1998 and 2017. Knowing that the average earnout period is between 2 and 3years (Cain et al., 2011), we end our sample period in 2017 to guarantee

at least 3 years of available data post-deal to evaluate the earnout effect. We use the date the deal becomes effective because it is the closest date to when the acquirer takes control of the target, which is central in our analysis[6]. The main data on M&A deals are from SDC Platinum; stock market and firm-level accounting data are from Refinitiv Datastream/Worldscope. Data on earnout contract details, such as earnout period, method of payment, and earnout metric were hand-collected from the SEC[7] disclosures for US firms. For comparison purposes, we use a control sample of deals without earnouts.

We impose the following conditions for a deal to be included in our final sample. First, the acquirer is a U.S. publicly traded firm registered in one of the major stock exchanges (NYSE, NYSE American, or NASDAQ). Second, the acquirer owns less than 50% of the target before and more than 50% after the deal is completed. Third, the deal is classified in SDC either as an acquisition or a merger. Fourth, both acquirer and target are not in financial or regulated sectors. Fifth, the book value of equity must be non-negative. Sixth, only completed deals above $1M are considered. Finally, there is sufficient data to compute earnings management for at least one year after the deal is completed.

Additionally, to avoid confounding effects due to overlapping acquisitions over the earnout period, our analysis imposes a three-year interval between deals involving the same acquirer. Subsequent deals by the same acquirer (which may differ in size, method of payment, etc.) occurring during the earnout period of a previous deal would distort the measurement of earnings management and compromise our identification strategy.

We end up with 517 deals involving earnouts and 3,928 deals without earnouts. Panel A of Table 1 presents the distribution of deals by year and method of payment. In line with Bates et al. (2018) and Elnahas et al. (2017), there is an increase in the proportion of deals with earnout payments since 2010[8]. Notably, there is a peak in the use of earnouts in the aftermath of the financial crisis, when uncertainty soared and risk tolerance plummeted. Panel B details the method of payment. In line with previous research (e.g., Cain et al. (2011); Barbopoulos et al. (2017)), most earnout deals have cash as first payment (58%) and very few involve only earnouts (0.1% of the full sample and 0.5% of deals with earnouts). This supports the idea that earnouts are used as complement rather

[6] Although most of the deals in our sample became effective in the same year it was announced, the gap may go up to two years or more.
[7] https://www.sec.gov/edgar.shtml
[8] It is worth noting that in December 15, 2008 SFAS 141(R) became effective, requiring the recognition and periodic remeasurement of liabilities related to earnouts. Before SFAS 141 (R), only on settlement date firms were required to recognize any payments. See Cadman et al. (2014) for detailed explanation on the accounting for earnouts before and after SAFAS 141 (R).

than a substitution of other forms of payment. Panel C shows some characteristics of earnout contracts. Earnout thresholds are mainly based on target firm performance (about 64% of the cases for which we were able to get information). The remaining 37% are based on acquirer performance (when the acquired firm remains as a standalone entity) or the resulting firm (when there is a merger)[9]. There are 506 deals for which we are able to get information on the length of the earnout period. Again, in line with prior studies, about 74% of the deals have an earnout period up to 3 years. The average (median) earnout length of our sample is 2.56 (2) years, similar to the 2.57 (2) reported by Cain et al. (2011). Finally, we present the earnout percentage eventually paid. We are able to collect information about the earnout percentage paid for 372 deals (out of the total 517): 29% of the acquirers paid less than 10% of the earnout and 18% paid more than 90% of the agreed value. In the majority of deals (54.3%) more than 50% of contingent payment is never paid; full payment only occurs in 15% of the earnout deals. These numbers help us understand why it is quite common that earnout contracts end up in disagreement and lawsuits (Viarengo et al., 2018).

[Insert Table 1 here]

Table 2 exhibits deal and firm characteristics. Non-earnout acquirers are larger firms (both in market value and total assets terms) and make bigger deals when compared to earnout acquirers. The mean (median) earnout portion of the total deal value is about 32.01% (26.32%) and the mean (median) deal value is $102 million ($28 million), showing the economic relevance of these deals. These values are in line with the 33% (29%) presented by Cain et al. (2011) and 34% of Barbopoulos et al. (2017).The earnout fraction of deal value is similar if we measure it as a percentage of total assets or as a percentage of market value. Earnout deals are mostly used when the target is a non-publicly traded firm (approximately 74% private and 24% subsidiaries firms), supporting the argument that earnouts contracts serve to overcome information asymmetry problems which are more severe in these types of firms[10]. Also, as expected, bidding firms of earnout deals have slightly higher growth opportunities (as measured by the market-to-book ratio), suggesting that the financial flexibility of earnouts is appreciated by buyers

[9] For earnout deals classified by SDC as a "Merger" and for which we were unable to find information about the firm on which performance is measured, we assume as acquirer-based performance. This assumption does not affect our results.

[10] These values are in line with previous studies: Barbopoulos et al. (2017) report target firms in earnout deals to be 75% private and 23% subsidiaries, while Bates et al. (2018) report 78% private and 20% subsidiaries.

with more positive NPV projects. Additionally, acquirers that use earnouts are less levered, which may be related to the fact they are also smaller firms and usually belong to industries with higher uncertainty.

[Insert Table 2 here]

3.2. Methodology

We estimate accrual-based earnings management within industry-year groups with at least 10 observations. Industries are based on Fama-French 48 Industry classification.

We follow the modified-Jones model of Dechow et al. (1995) approach to measure discretionary accruals. First, we estimate the following regression per industry-year for all firms not engaged in M&A deals during the period of interest:

$$\frac{Accr_{i,t}}{TA_{i,t-1}} = \alpha + \beta_1.\frac{1}{TA_{i,t-1}} + \beta_2.\frac{\Delta Rev_{i,t} - \Delta Rec_{i,t}}{TA_{i,t-1}} + \beta_3.\frac{PPE_{i,t}}{TA_{i,t-1}} + \beta_4.ROA_{i.t-1} + \varepsilon_{i,t} \quad (1)$$

where the subscripts *i* and *t* refer to firm and period, respectively; *Accr* is net income before extraordinary items minus cash flow from operations; *TA* are the Total Assets; ΔRev is the change in revenues from the previous to the current year; ΔRec is the change in accounts receivable; and *PPE* is Property, Plant and Equipment; *ROA* is Return on Assets With the parameters from equation (1), we estimate the nondiscretionary accruals:

$$NDAccr_{i,t} = \hat{\alpha} + \widehat{\beta_1}.\frac{1}{TA_{i,t-1}} + \widehat{\beta_2}.\frac{\Delta Rev_{i,t} - \Delta Rec_{i,t}}{TA_{i,t-1}} + \widehat{\beta_3}.\frac{PPE_{i,t}}{TA_{i,t-1}} + \widehat{\beta_4}.ROA_{i.t-1} \quad (2)$$

We finally get the discretionary accruals as the proxy for the firm earnings management:

$$DAccr = \frac{Accr}{TA_{i,t}} - NDAccr_{i,t} \quad (3)$$

Following Roychowdhury (2006), Cohen et al. (2008) and Cohen and Zarowin (2010), we also use two metrics of real earnings manipulation: discretionary expenses and abnormal production costs[11]. One way firms can manipulate earnings is through sales

[11] As noted by Roychowdhury (2006), abnormal CFO may be influenced in opposite directions by discretionary expenses and abnormal production costs – lower discretionary expenses (overproduction) inflate (deflate) earnings and reduces (increases) abnormal CFO – which makes this measure ambiguous. For that reason, we exclude it from our set of earnings management proxies.

increase (decrease) which can be achieved by offering larger (smaller) price discounts or easing (tightening) credit conditions.

Alternatively, managers can use overproduction (underproduction) to artificially inflate (deflate) earnings. By producing more (less) than usual and necessary, managers will spread fixed costs by a larger (lower) number of units, leading to a lower (higher) unit cost, implying a decline (increase) in the cost of goods sold (*COGS)* and better (worse) margins. However, to increase (decrease) production level, firm will face additional (fewer) production and holding costs, resulting in higher (lower) production costs relative to sales and lower (higher) cash flow from operations.

Production costs are expressed as the sum of *COGS* and change in inventory. First, we model *COGS* as:

$$\frac{COGS_{i,t}}{TA_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{TA_{i,t-1}} + \alpha_2 \frac{SALES_{i,t}}{TA_{i,t-1}} + \varepsilon_{it} \quad (4)$$

Next, we model changes in inventory:

$$\frac{\Delta Inv_{i,t}}{TA_{i,t-1}} = \beta_0 + \beta_1 \frac{1}{TA_{i,t-1}} + \beta_2 \frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + \beta_3 \frac{\Delta SALES_{i,t-1}}{TA_{i,t-1}} + \varepsilon_{it} \quad (5)$$

ΔInv is the change in inventories.

Using the coefficients' estimates of (4) and (5), normal levels of production costs are given by:

$$\frac{Prod_{i,t}}{TA_{i,t-1}} = k_0 + k_0 \frac{1}{TA_{i,t-1}} + k_1 \frac{SALES_{i,t}}{TA_{i,t-1}} + k_2 \frac{\Delta SALES_{i,t}}{TA_{i,t-1}} + k_3 \frac{\Delta SALES_{i,t-1}}{TA_{i,t-1}} + \varepsilon_{it} \quad (6)$$

Prod captures the production costs and is given by the sum of cost of goods sold and change in inventories. Abnormal production costs (Ab. Prod. Costs) are the difference between production costs, estimated from equation (6), and the actual production costs. Finally, the normal level of discretionary expenses is derived using the following model:

$$\frac{DiscExp_{i,t}}{TA_{i,t-1}} = \alpha_0 + \beta_1 \frac{1}{TA_{i,t-1}} + \beta_1 \frac{SALES_{i,t-1}}{TA_{i,t-1}} + \varepsilon_{it} \quad (7)$$

DiscExp are discretionary expenses defined as the sum of R&D (research and development) with SGA (sales, general and administrative expenses). Abnormal discretionary expenses (Ab. Disc. Exp.) are the difference between actual discretionary

expenses and the expected value of discretionary expenses using the estimated parameters from equation (7).

In line with Cohen and Zarowin (2010) and Zang (2012), we combine the two measures of real earnings management to capture the full effect of earnings manipulation. Like these authors, we first multiply abnormal discretionary expenses by negative one so that positive (negative) amounts of these measures mean income increasing (decreasing) earnings management. Then, we build our aggregate measure – total real earnings management (TRM) – by adding the discretionary expenses with abnormal production costs.

To examine whether bidders of deals with earnouts tend to manage earnings downward during the earnout period, we estimate the following model:

$$\begin{aligned} EM_{it} = \alpha + \beta_1 Earnout_i + \beta_2 RelativeSize_i + \beta_3 TA_{it} + \beta_4 PublicTarget_i \\ + \beta_5 CrossBorder_i + \beta_6 SameIndustry_i + \beta_7 Leverage_{it-1} + \beta_8 ROA_{it} + \\ \beta_9 MTB_{it} + \beta_{10} Analyst_{it} + \mu_t + \lambda_j + \varepsilon_{it} \end{aligned} \quad (8)$$

EM is our measure of earnings management – discretionary accruals (Disc. Accr.), abnormal discretionary expenses (Ab. Disc. Exp.), abnormal production costs (Ab. Prod. Costs) and the sum of the 2 measures of real earnings management (TRM); *Earnout*, our variable of interest, is a dummy variable that takes the value of one if the deal involves earnouts, and zero otherwise; *RelativeSize* is the ratio between the deal value and acquirer's book value of assets; *TA* is a natural logarithm of acquirer's total assets; *Public Target* is an indicator variable that equals one if the target is publicly traded at the time of the deal, and zero otherwise; *CrossBorder* is an indicator variable that equals one if the target is from a country other than USA, and zero otherwise; *SameIndustry* is an indicator variable that equals one if both acquirer and target are in the same Fama-French 48 Industry classification, and zero otherwise; *Leverage* is the total debt divided by total assets; *ROA* is earnings before extraordinary items divided by total assets at the beginning of the year; *MTB* is the ratio between the market value of equity and the book value of equity; *Analysts* is the natural logarithm of 1 plus the number of analysts following the firm (set to zero if not reported). In all regressions we include dummies to control for year (μ_t) and industry (λ_j) fixed effects.

When deciding whether to engage in earnings management and choose between accruals or real earnings management, managers must consider both firm's ability to do so and the costs and risks of each alternative (Cohen and Zarowin, 2010; Zang, 2012). Accrual-based earnings management are subject to higher scrutiny of accounting

practices while earnings management through real activities are harder to detect and can be justified by managers' operating decisions (Cohen et al., 2008). We conjecture that depending on the length of the earnout period, managers may have a preference for one or the other type of earnings management. For shorter the periods, accrual-based earnings management are more suitable since they are more readily available, and have no impact in firm's real activity. Also, continuing accrual manipulation over a longer earnout period has a high risk of being detected or, if stopped, being reversed to pre manipulation levels having the unintended effect on the earnout payment. As real activities manipulation is less likely to be detected, they it is expected to be more frequent when earnout periods are longer. To test our conjectures, we replace our variable "Earnout" by 3 new variables according to the length of earnout period: Short period, Medium Period and Long Period.

To test the relevance of initial payment in earnout deals, we regress equation (8) using subsamples of treatment and control groups according to the type of upfront payment, that is, we create subsamples of earnout deals according to their initial form of payment (cash, stock or mix) and match them with non-earnout deals with the same form of payment (e.g., earnout deals with initial payment in cash are matched with cash-only deals).

To assess whether the practice of earnings management post acquisition actually yields the managers' desired outcome, i.e., reduce the earnout payment, we estimate the following model:

$$\begin{aligned}\text{Earnout paid }(\%)_{it} = \alpha + \beta_1 EM_{kit} + \beta_2 RelativeSize_i + \beta_3 TA_{it} + \beta_4 PublicTarget_i \\ + \beta_5 CrossBorder_i + \beta_6 SameIndustry_i + \beta_7 Leverage_{it-1} + \beta_8 ROA_{it} + \\ \beta_9 MTB_{it} + \beta_{11} Analyst_{it} + \mu_t + \lambda_j + \varepsilon_{it} \qquad (9)\end{aligned}$$

The dependent variable (*Earnout paid %)* is the fraction of earnout ultimately paid with respect to the total earnout amount. Given that our dependent variable ranges from 0 to 100%, we design the model as a two-boundary Tobit regression, where the dependent variable is left censored at 0 and right censored at 1. We run the regression separately to each of earnings management proxy where our variable of interest EM is a dummy variable that takes the value of 1 if the corresponding earnings management measure is below the median and zero otherwise.

4. Empirical Results

4.1. Earnouts and the practice of earnings management

We start by testing whether the level of earnings management is different between the treatment group (deals with earnouts) and the control group (deals without earnouts). In Table 3, we test the difference in means in each of the 3 years after the deal becomes effective (period 1, period 2 and period 3 – Panels A to C, respectively) and over the entire period (period 1 to 3, both inclusive – Panel D). We compute the difference in means for each earnings management proxy between non-earnout deals and earnout deals[12]. We choose to exclude the year of deal completion (period 0) for two reasons. First, the accounting for the acquisition and its costs (advisors fees, deal-related costs, legal fees etc.) may impact the balance sheet and income statement in a way that would make our analysis and conclusions untrustworthy. Secondly, it is unlikely that the acquiring firm can materially influence the financial reports in such a short time.

[Insert Table 3 here]

We find evidence of earnings management post acquisition (up to three years) by firms that use earnouts. Panel A of Table 3 shows that managers seem to rely on accruals to lower results only in the first year after deal completion, which may be related to the fact that this is the easiest way to manipulate earnings in the short term. Additionally, given the positive correlation between the size of the earnout (as percentage of total deal value) and the earnout length, accounting manipulation may suffice to avoid or reduce the relatively small earnouts payments. The difference in signed accrual-based earnings management between the earnout sample and the non-earnout sample is -0.97% (statistically significant at the 5% significance level), meaning that managers manipulate earnings downwards one year after the deal when earnouts are involved. This difference is also economically significant as it represents a percentage of total assets. The difference in real earnings management in general, and discretionary expenses in particular, between deals involving earnouts and deals without earnouts is also negative (and statistically significant at a 1% level) throughout the periods, indicating that for longer earnout periods, managers find the need to engage in earnings manipulation right from the beginning. The difference in discretionary expenses ranges from -2.51% in period 3 and -2.93% in period 2

Finally, considering the 3 years together (panel D of Table 3) we find that our real earnings management measures are statistically significant at the 1% significance level,

[12] Using medians instead of means does not qualitatively change our overall results.

except for abnormal production costs, which is statistically significant at 10%. The results are also economically significant: taking total real earnings management (TRM) as example, the average TRM of the earnout deals is 3.62% greater than their non-earnout counterparts – a difference that is larger in magnitude than the average TRM of the full sample (2.92%). Discretionary accruals are statistically significant at 5% significance level. The weaker results on abnormal production costs (only significant when considering the full three-year period) suggests that they may be used as last resource, which can be related to its longer-term effects on firm performance. Overall, our first set of results clearly indicate downward earnings management by acquirers that use earnouts as a form of payment.

Next, we estimate equation (8) to understand the effect of earnouts on acquirers' earnings management after controlling for a set of variables that might explain the variation in earnings management post deal.

The regression results from estimating equation (8) are reported in Panel A of Table 4. Our main variable of interest, Earnout, is negative and statistically significant in the regressions of discretionary accruals, discretionary expenses and aggregate real earnings management measures (TRM), suggesting that acquirers that use earnouts to pay for the acquisitions tend to deflate their earnings post deal when compared to non-earnout acquirers. The magnitude of this effect is also economically significant. Earnings are managed downwards by increasing Discretionary Expenses by 2.33 percentage points (pp) in earnout deals when compared to our control sample of non-earnout deals, *ceteris paribus*; this represents about 1.6% of the mean. Although there is no evidence of earnings manipulation through abnormal production costs, when we combine the two measures of real earnings management (TRM), the difference is more pronounced: the negative impact of earnouts on TRM is about 3 pp, representing 1%. of its full sample mean. . Additionally, the impact of earnouts on post-deal discretionary accruals, although negative, is statistically significant only at a 10% significance level. Taken together, these results indicate that managers rely on real activities to manipulate earnings and not so much on accruals, probably because real activities are harder to detect, more difficult to control and easier to justify.

[Insert Table 4 here]

These results are globally in line with the univariate analysis. As already mentioned, accruals, being an accounting resource of earnings manipulation, are more readily available and tend to be preferred by managers interested in impacting earnings quickly

and for a brief period. Ultimately, inflated or deflated accruals must be reverted; if accruals manipulation continues over time, the risk of being detected increases considerably, making this strategy of earnings management unsuitable for longer periods. We conjecture that the length of the earnout period is a relevant factor for the decision to engage in earnings management and how to implement it (accruals versus real earnings management). We posit that acquirer managers may not have the incentive or even the chance to materially influence the outcome in deals with a short earnout period using real activities. For longer earnout periods, the earnout clauses become more like a royalty agreement. Moreover, it would be very costly to engage in earnings management during an extended period of time. Thus, in contrast with intermediate earnout periods, the practice of real earnings management is less likely to be associated with deals when the earnout period is either short or long.

To test this hypothesis, we re-estimate our main equation (8) with "*Short Period"*(a categorical variable that takes the value of 1 if the earnout period is equal or lower than 1.5 years[13], and zero otherwise), "*Medium Period*" (a categorical variable that takes the value of 1 if the earnout period is greater than 1.5 years and lower or equal than 5 years, and zero otherwise) and "*Long Period*" (a categorical variable that takes the value of 1 if the earnout period is longer than 5 years, and zero otherwise) as additional control variables. The results are presented in Panel B of Table 4. We find a weak significant impact of short period earnouts only for abnormal discretionary expenses, giving support to our idea that managers lack the incentive or opportunity to manipulate earnings through real activities over shorter periods. In contrast, managers seem to prefer to use discretionary accruals when seeking for a more immediate impact on earnings. In the regressions of accrual-based earnings management, the coefficients on Short (and Medium) Earnout periods are negative and statistically significant at the 10% significance level. Moreover, the coefficient is of much larger magnitude for short period (1.6 times) than for medium period earnouts, reinforcing the idea that accruals manipulation post acquisition is more associated with earnout agreements defined over a short period of time. Earnouts with a period between 1.5 and 5 years, "Medium Period", have a negative and statistically significant impact on discretionary accruals, discretionary expenses and aggregated real earnings management, which furthers supports our idea that managers

[13] We use 1.5 years instead of 1 year as a cutoff between short and medium period because is unlikely managers engage in earnings management affecting a full year if the earnout measurement is dependent on the performance during less than half a year.

have the incentives (both the need and the opportunity) to manage earnings, either through accruals or real activities. For longer earnout periods we find some evidence of earnings management through real activities in the three years after the deal is completed, although this evidence is weaker than for medium period. This evidence suggests that for longer earnout periods acquirers manage earnings mainly during the first years but not throughout the entire earnout period with the same intensity. Not only because the first year of more intensive earnings management may suffice to reduce the earnout payment[14], but also because extending this practice over longer periods of time is costly and increases the risk of being detected.

4.2. What is the impact of earnings management on the amount of earnout paid?

After establishing that bidder managers tend to engage in downwards earnings manipulation post earnout acquisitions, mainly through real activities, we now investigate whether this practice has a material impact on the earnout payment, i.e., whether managers that more aggressively manage earnings downwards end up paying a smaller fraction of the earnout amount. To do so, we restrict our sample to earnout acquisitions only and estimate the Tobit model represented in Equation (9). The dependent variable is the percentage of earnout actually paid and the variable of interest (*EM*) is 1 for companies that engage more aggressively in downwards earnings management and zero otherwise. We use as a cutoff the median value of the different measures of earnings management.

[Insert Table 5 here]

The results, presented in Table 5, suggest that managers that more intensively engage in negative earnings management through real activities end up paying a lower fraction of the earnout. The coefficient on *EM* is negative and statistically significant whenever earnings management is measured by discretionary expenses, abnormal production costs, or a combination of both. The economic magnitudes are also relevant. Taking model (3) as an example, bidders that engage more intensively in earnings management by increasing abnormal production costs pay, on average, 12% less of the total earnout, which, based on the average earnout amount, corresponds to a dollar

[14] In some earnout contracts, not achieving periodic milestones ceases any further measurements and terminates any earnout obligations.

amount of $3.5 million. These results clearly reveal that it is plausible to conjecture that bidder managers have an incentive to manipulate earnings downwards to avoid part of the contingent payment – a strategy that seems to pay off.

4.3. Initial Payment Method and Earnings Management in Earnout Deals

In this section, we analyze whether the type of upfront payment (cash, stock, or mixed) in deals with earnouts has any effect on bidder managers' incentives to manipulate earnings post deal as an attempt to reduce the agreed future contingent payments. Barbopoulos et al. (2017) study the relevance of initial payment in acquirers' gains and find that stock is used as an upfront payment in deals with earnouts, returns to bidder shareholders tend to be higher. The authors suggest that the way earnout deals are structured in terms of the forms of payment is relevant for solving moral hazard and adverse selection problems.

When stock is used as the initial payment in a deal with earnouts, sellers, who become shareholders of the combined company, have higher incentives and the means to better monitor the acquirer managers. As a result, the practice of earnings management to reduce future payments may be riskier, leading managers to refrain from manipulating earnings or reduce this activity. To investigate our conjecture, we next test if the type of upfront payment has any impact on the practice of earnings management post-earnout deals. We also analyze if the impact is different depending on the type of earnings management – based on accruals or real activities. Specifically, we create subsamples according to the form of payment, focusing on the upfront payment of earnout deals (cash, stock, and mix) [15]. We then run our main analysis by estimating equation (8) on each group of deals by type of payment. Additionally, for deals that involve stock and cash – mix – as type of payment (in the case of non-earnout deals) or upfront payment (in the case of deals with earnouts), we distinguish those that are mainly (>50%) in cash or stock.

[Insert Table 6 here]

Table 6 presents the results. In Panel A, we include deals fully paid with either cash or stock (besides the earnout in earnout-deals) and in Panel B we consider deals paid with both stock and cash, further dividing into whether cash or stock predominates. As before, our variable of interest is *Earnout*, an indicator variable equal to 1 if the deals involve

[15] For example, earnouts deals which have stock as upfront payment are compared against stock-only deals.

earnouts, and 0 otherwise. In Panel A, when comparing earnout deals, which upfront payment is made in cash, against non-earnout cash-only deals, we find a negative and statistically significant impact of using earnouts on discretionary expenses (column 3) and on total real earnings management (column 7). On the contrary, when comparing earnout deals with first payment made in stock against non-earnout deals fully paid in stock, we find the opposite result – a strong evidence of upward earnings management through abnormal production costs (column 6) and total real earnings management (column 8) in deals involving earnouts (the coefficients on *Earnout* are positive and statistically significant). Specifically, firms using earnouts with a stock-based upfront payment tend to have, on average, 7.16 pp higher abnormal production costs than their non-earnout counterparts who paid their acquisitions with stocks. This evidence suggests that when sellers become shareholders of the acquiring firm, they monitor managers more closely, preventing them to engage in practices that would jeopardize the achievement of earnout threshold. In fact, in line with Elnahas et al. (2017), the results even suggest that the pressure put by these new shareholders increases the likelihood of achieving the earnout threshold,. When the payments are a combination of stock and cash (Panel B), the results lead to similar conclusions: when there is prevalence of stock, we find no evidence of different earnings management practices, while if the payment is predominantly in cash, we find evidence of downward earnings management through accruals by firms using earnouts. Overall, we can conclude that the type of upfront payment in earnout deals is an important matter as it creates different incentives with respect to earnings manipulation.

4.4 Robustness tests

4.4.1 Refining the identification strategy

So far, we used three years of data post acquisition to measure the practice of earnings management. We applied this procedure to all deals, however earnout periods range from 0.25 to 15 years, which means that in some cases we included earnings management that go beyond the earnout period, when the manager incentive to reduce the contingent payment no longer exists. For example, for deals with an earnout period of 2 years, year 1 and 2 post acquisition are related to earnout period while year 3 occurs after the earnout period ended and, therefore, no earnings management are expected to

take place. Additionally, if our identification strategy is accurate, we don't expect to find any difference in our earnings management measures between deals with and without earnouts for the years after the earnout period ends since the incentives to engage in such practices (the earnout payment) no longer stands. To tackle these concerns, we identify, in our three-year post deal dataset, the years in which the earnout was active ("during earnout") and the years after it expired ("post earnout" - whenever expiration occurs within less than three years post deal). We then split the earnout-year sample into two: years of active and years of expired earnouts and add the corresponding non-earnout control sample. In Table 7 we re-estimate our main regressions of earnings management using each subsample separately. Panel A shows the results for the years during the earnout period, while Panel B reports the results for years after the earnout period.

[Insert Table 7 here]

The results from Panel A are similar to those in Table 4 and generally greater in the magnitude of the earnout impact on earnings management. We do find, however, that the weak impact of short period earnout on discretionary expenses (shown in Table 4) eventually disappears when we only focus on the years when earnouts are active. In contrast, the negative coefficient on "Short Period" remains significant in the regression of discretionary accruals – model (1). This result reinforces our idea that accruals-based earnings management is the most immediate way managers can use to tamper earnings and achieve a certain goal when the time window to do so is shorter. Also as before, post-deal real earnings management (specifically abnormal discretionary expenses and TRM) seem to be preferred when earnouts last between 1.5 years and 5 years.

The results in Panel B of Table 7 show that in the years after the earnout period no significant differences exist in earnings management between firms that used earnout and the control sample of non-earnout users. Although no reversals were expected to be found in real earnings management measures, as these are not accounting-based, the same may not apply to accruals. One might expect that after a downward earnings manipulation through accruals, the reverse effect should occur when the earnout is no longer active. However, firms that use earnouts face high scrutiny and any evidence of inappropriate practices may lead to legal actions. Thus, the best way out is to smooth accruals reversal over time and reduce the chances of being detected. Our results are consistent with this view.

Overall, our evidence gives further support to the fact that earnings management are indeed related to the inclusion of earnouts and not to other random factors.

4.4.2 Addressing endogeneity issues

We recognize the endogenous nature of earnings management decision and the use of earnouts arrangements in acquisitions. Although sellers of acquisitions with earnouts might investigate the practice of earnings management by the acquirer prior to the deal (Prencipe and Viarengo (2022), it is reasonable to consider that bidders that are more prone to engage in earnings management may also be more likely to use earnouts. To address such concerns, we use the Heckman (1979) procedure. In the first step, we run a probit model to estimate the probability of including earnouts in a deal. We include a categorical variable that identifies the years pre and post the global financial crisis as an instrument (the variable is equal to one for deals announced after 2007 and zero otherwise). Given the increased uncertainty that affected businesses around the world in the aftermath of the financial crisis, it is expected that more M&A deals will include state-contingent payments to overcome excessive uncertainty, find a common ground between bidders and targets, and bring the deal to a closure. A valid instrument should be relevant to explain the likelihood of using earnouts in M&As, but unrelated to the practice of negative earnings management. Theoretically, there is no reason to believe that post financial crisis bidder managers are more likely to engage in downwards earnings management post earnout deals than before the crisis. We then estimate the second-stage regressions, similar to those in Table 4, plus an additional term - the inverse Mill's ratio (*Lambda*) estimated from the first-stage regression to correct for potential selection bias affecting earnout deals.

[Insert Table 8 here]

Table 8 reports the results. As expected, in column (1) the dummy variable *pos-07* is positive and statistically significant meaning the likelihood of including earnouts in M&A deals is higher after the financial crisis. Including *Lambda* in regressions (2) to (5) as an additional control variable does not change our findings reported in Table 4. Overall, these results are consistent with our main prediction that firms using earnouts as a method of payment tend to engage in negative earnings management to avoid or reduce the amount paid.

In addition, following other studies (e.g., Barbopoulos et al. (2017); Elnahas et al. (2017); Bates et al. (2018)), we use an alternative method to address endogeneity by creating a matched sample of deals that do not use earnouts, based on several firm and deal characteristics. Specifically, we use the coarsened exact matching (CEM) technique proposed by Blackwell et al. (2009)[16]. CEM divides the sample firms into bins based on each chosen covariates and then matches on the strata. We base our matching procedure on the following covariates: Deal Size, Total Assets in t-1, Sales in t-1, Crossborder (dummy), Public Target (dummy), Year and Industry. We then re-estimate our main equation, similar to Table 4 (Panel A) using the treated and the control samples. The results shown in Table 9 are similar to what we uncovered above, meaning that our conclusions remain unchanged.

[Insert Table 9 here]

4.4.3 Additional tests

The fact that our analysis is based on acquirer firms' accounting figures when most of the earnouts thresholds are defined upon the acquired firm's accounting performance measures may raise some questions. Our argument is that earnings management in the acquired firms are reflected on the accounts of the acquiring firms through accounting consolidation. It is not uncommon that ultimate parent companies use their subsidiaries to engage in earnings management (e.g., (Shuto, 2009; Aharony et al., 2010; Bonacchi et al., 2018) to reach certain goals – a practice that is more difficult to be detected, but will ultimately be reflected in the consolidated accounts. Thus, linking the earnout threshold to the target's performance post acquisition creates the same incentives on bidder managers to manipulate earnings downwards to avoid the full payment of the earnout. When the earnout threshold is based on acquirer's performance (such as in the deals where, instead of remaining as a subsidiary, the target is fully merged into the acquiring firm), although managers have the same incentive to manipulate earnings, the risk of being detected may be higher due to the public scrutiny of the acquirer.

To address any concerns that this idea might be flawed, we re-estimate our main regression models separately for deals which earnout thresholds are based on performance measures of the acquired or the acquiring firms. Should our argument be

[16] If we use Propensity Score Matching (PSM) instead of CEM our conclusions remain unchanged although CEM preserves significantly more observations than PSM.

invalid, one would only find evidence of earnings management when the earnout payment is related to acquiring firms' performance.

[Insert Table 10 here]

Results in Table 10 show that earnout deals with target-based thresholds are associated with negative earnings management through real activities post deal – the coefficients on "Target-based threshold" are negative and statistically significant in the regressions of discretionary expenses, abnormal production costs and TRM. This evidence alleviates possible concerns that acquiring firms accounts are unable to reflect earnings management made through the target firms post acquisition. As for the earnouts with thresholds based on the acquirer's performance, there is weak evidence of earnings manipulation, which may be explained not only by the lower incidence on such deals in the sample, but also by the more stringent public scrutiny that bidders' accounts are subject to and the consequent risks of being detected if earnings management is done directly by the bidder and not, for example, through a subsidiary (Shuto, 2009; Aharony et al., 2010; Bonacchi et al., 2018).

Finally, there may be a concern that our results are driven by the quality of the bidder's auditor. It is possible that acquirers in the earnout sample hire lower-quality auditors, which could explain their tendency to engage in earnings management. To address this issue, we include an additional variable in our main regression model that captures the auditor's quality, namely the dummy variable Top Auditor that takes the value of 1 if the buyer's auditor is one of the Big 4, and 0 otherwise[17]. We also test if the positive relation between the use of earnouts and the practice of earnings management, as uncovered in this study, is moderated by the auditor's quality by including the interaction term Earnout x Top Auditor in the regressions. Results in Table 11 confirm our previous conclusions about the prevalence of earnings management through real activities. Moreover, the interaction term is not statistically significant, that is, acquirers that use earnouts and have a Big 4 audit firm do not engage more in earnings management than those with a non-Top Auditor. This evidence rules out the possibility of our results are driven by the acquirer auditor's quality and not from the use of earnouts.

[17] The group of "the biggest audit firms" was composed of 6 and 5 firms in the past and currently includes 4 firms. We use the classification as of the time of the deal; following Lee and Masulis (2011), we include Arthur Andersen, Coopers & Lybrand, Deloitte & Touche, Ernst & Young, KPMG and PricewaterhouseCoopers in the group of Top Auditors.

[Insert Table 11 here]

5. Conclusions

Earnouts allow the parties involved in acquisitions to close a deal when uncertainty about the prospects of the target (thus, its value) is more severe. Since what triggers contingent payments are performance measures usually based on accounting metrics, there are room and incentives to manipulate accounting figures. In this paper, we investigate whether and in what circumstances firms that use earnouts in M&A deals engage in earnings management practices during the earnout period to avoid or reduce its payment. Although earnings management have been referred as a potential negative consequence of using earnouts, empirical studies including a broader sample of deals and different types of targets are inexistent. In our study we use a sample of 517 earnout-user firms and a control group of 3,928 firms that don't use earnouts, for the period between 1998 and 2017.

We present evidence of significant downward earnings management associated with the use of earnouts, which is more pronounced when the upfront payment is made with cash. Our evidence is consistent with the idea that earnout users manage earnings downwards to avoid the payment of the contingent part of the price and that the additional seller's monitoring power, by becoming shareholder of the resulting firms, helps avert such practices. Our results are robust to potential selection bias problems that can arise due to the endogenous nature of the decision to use earnouts. In our analyses, we distinguish accrual-based from real activities earnings management. Our results show that managers manipulate earnings post earnout deals mainly through real activities (discretionary expenses or abnormal production costs), reflecting the fact that those are harder to detect, both by sellers and auditors, and easier to justify. Accruals are used to achieve more immediate goals as they are found in the first year post deal and are associated with shorter earnout periods. Finally, we provide evidence that, through earnings management, buyers achieve their objective as they pay, on average, less 13% of the total earnout amount.

Our study is relevant to inform policy as it sheds light on potential drawbacks of using earnouts and areas where action is needed (e.g., enforcing monitoring, disclosure, or

incentives mechanisms) to prevent manipulation of earnout triggers. Policy directed to mitigate earnings manipulation in the years following earnout deals can have a significant impact on restoring confidence on earnout arrangements and make this a more powerful tool to facilitate value-creating deals that would otherwise be left out. This is especially important when firms grow globally and new layers of uncertainty are added to their growth strategies, or in periods when the global economy is challenged with new potential sources of instability.

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Table 1 – Sample Description

This table shows the acquisitions included in our final sample, which were completed between 1998 and 2017 by US firms publicly traded in NYSE, NYSE American or NASDAQ. We exclude financial firms and utilities (SIC codes between 6000 and 6999 and between 4900 and 4949). Only acquirers with a equity stake in the target of less than 50% before and more than 50% after are considered. The acquisition must be classiffied as a merger or acquisition by SDC. Our treatment group includes deals involving earnouts and our control group includes deals paid only in cash. Panel A to E are self explanatiry.

Panel A – Year Distribution

Year Effective	Non-Earnout	Earnout	Earnout/Non-Earnout	Total
1998	272	22	8%	294
1999	273	21	8%	294
2000	269	24	9%	293
2001	199	19	10%	218
2002	169	18	11%	187
2003	168	14	8%	182
2004	181	22	12%	203
2005	183	27	15%	210
2006	215	24	11%	239
2007	237	32	14%	269
2008	202	29	14%	231
2009	108	20	19%	128
2010	128	18	14%	146
2011	151	34	23%	185
2012	153	27	18%	180
2013	134	22	16%	156
2014	185	30	16%	215
2015	197	33	17%	230
2016	219	37	17%	256
2017	285	44	15%	329
Total	3928	517	13%	4445

Panel B – Method of Payment	N	%
Cash	2563	57.7%
Cash and Stock	544	12.2%
Stock	529	11.9%
Other	292	6.6%
Cash and Earnout	329	7.4%
Cash, Stock and Earnout	139	3.1%
Stock and Earnout	46	1.0%
Earnout	3	0.1%
Total	4445	100.0%

Panel C – Earnout deals characteristics

	N	%
Firm Performance threshold		
Target	290	63.5%
Acquirer	167	36.5%
Total	457	100.0%
Earnout length (years)		
>0 and =<1	127	25.1%
>1 and =<2	130	25.7%
>2 and =<3	117	23.1%
>3 and =<4	40	7.9%
>4 and =<5	27	5.3%
>5 and =<6	4	0.8%
>6	16	3.2%
Total	506	100.0%
Earnout paid (%)		
<10%	107	28.8%
>=10% and <25%	29	7.8%
>=25% and <50%	66	17.7%
>=50% and <75%	55	14.8%
>=75% and <90%	28	7.5%
>=90%	67	18.0%
Total	372	100%

Table 2 – Descriptive statistics

This table provides descriptive statistics for acquirer firms in the year the deal becomes effective. Dollar values are expressed in US$ million ($MM) reflecting 1998 Consumer Price Index). "DV (MM)" is deal value in millions of dollars. "Owned after deal (%)" is the percentage of shares owned after the deal is completed. "EO(%)" is the amount of earnout consideration divided by the total deal value. "Target Public" is an indicator variable that takes the value of 1 if the target firm is a public firm and 0 otherwise. "Cross-border" is an indicator variable that takes the value of 1 if the target is from a country other than USA and 0 otherwise. "MV ($MM)" is market value in millions of dollars. "Sales ($MM)" is sales in millions of dollars. "Debt ($MM)" is total debt in millions of dollars. "Total Assets $(MM)" is total assets in millions of dollars. "Net income ($MM)" is net income in millions of dollars. "M/B" is market-to-book value. "DV/TA" is the ratio between deal value and lagged total assets. "DV/MV" is the ratio between deal value and market value. "Leverage" is total debt divided by total assets. "ROA" is return on assets computed as net income divided by lagged toral assets. "Disc. Accr." is discretionary accruals, "Disc. Exp." is discretionary expenses, "Abn. Prod. Costs" is abnormal production costs and "TRM" is Total Real Earnings Management (the sum of discretionary expenses and abnormal production costs). Earnings management variables' values (Disc. Accr., Disc. Exp., Abn. Prod. Costs and TRM) are referred to the 3-years period average after deal becomes effective. All variables are defined in Appendix A. All continuous variables are winsorized at 1% level.

	Total			Non-earnout			Earnout		
	Mean	Median	N	Mean	Median	N	Mean	Median	N
DV (MM)	259.335	38.963	4445	279.941	41.314	3928	102.779	28.402	517
Owned after deal (%)	99.079	100	4445	99.005	100	3928	99.639	100	517
EO (%)	3.734	0	4445	0	0	3928	32.107	26.316	517
Target Public	0.14	0	4445	0.156	0	3928	0.017	0	517
Cross-border	0.203	0	4445	0.206	0	3928	0.178	0	517
MV ($MM)	3317.352	560.821	4424	3485.673	626.244	3909	2039.749	275.532	515
Sales ($MM)	2235.927	399.389	4436	2393.465	458.028	3920	1039.124	178.531	516
Debt ($MM)	806.712	97.386	4429	866.498	118.129	3914	352.333	14.019	515
Total Assets $(MM)	2716.564	507.045	4436	2899.59	570.135	3920	1326.142	219.637	516
Net income ($MM)	110.841	9.858	4435	116.914	11.775	3919	64.719	3.818	516
M/B	3.676	2.169	4424	3.535	2.168	3909	4.75	2.199	515
DV/TA	0.571	0.116	4405	0.584	0.111	3892	0.472	0.16	513
DV/MV	0.339	0.082	4316	0.346	0.08	3821	0.286	0.104	495
Leverage	0.24	0.215	4429	0.248	0.225	3914	0.178	0.12	515
ROA	-0.064	0.039	4404	-0.064	0.04	3891	-0.066	0.031	513
Disc. Accr.	0.0007	0.001	4432	0.0014	0.0013	3917	-0.0045	-0.0036	515
Abn. Disc. Exp.	0.0144	0.024	4389	0.0168	0.0252	3875	-0.0038	0.0079	514
Abn. Prod. Costs	0.0148	0.014	4400	0.0159	0.0148	3888	0.0065	0.0062	512
TRM	0.0298	0.0379	4444	0.0328	0.042	3927	0.0064	0.0033	517

Table 3 – Univariate Analysis

This table reports univariate comparison of earnings management measures medians between treatment and control group. "Disc. Accr." is discretionary accruals, "Disc. Exp." is discretionary expenses, "Abn. Prod. Costs" is abnormal production costs " and TRM is Total Real Earnings Management (the sum of discretionary expenses and abnormal production costs). Panel A, B and C refer to the first, second and third reporting year after the deal becomes effective, respectively. Panel D refers to the 3-years period after deal becomes effective. P-values are reported in parenthesis. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively using Wilcoxon ranksum test for median difference.

Panel A – First reporting year after completion year

	Earnout	Non-earnout	Difference		
Period Effective=1					
Disc. Accr.	-0.0065	0.0032	-0.0097	(0.0162)	**
Disc. Exp.	-0.0092	0.017	-0.0262	(0.0036)	***
Abn. Prod. Costs	0.0087	0.0172	-0.0085	(0.3738)	
TRM	0.0011	0.0347	-0.0336	(0.0427)	**

Panel B - Second reporting year after completion year

Period Effective=2					
Disc. Accr.	-0.0028	-0.0017	-0.0012	(0.7764)	
Disc. Exp.	-0.0067	0.0226	-0.0293	(0.0014)	***
Abn. Prod. Costs	0.008	0.0167	-0.0087	(0.3760)	
TRM	0.0021	0.0394	-0.0373	(0.0304)	**

Panel C - Third reporting year after completion year

Period Effective=3					
Disc. Accr.	-0.0093	-0.0016	-0.0076	(0.0960)	
Disc. Exp.	-0.0037	0.0214	-0.0251	(0.0162)	**
Abn. Prod. Costs	-0.003	0.014	-0.017	(0.1201)	
TRM	-0.003	0.0357	-0.0387	(0.0464)	**

Panel D – First to third reporting years after completion year

1<=Period Effective<=3					
Disc. Accr.	-0.006	0.0002	-0.0062	(0.0109)	**
Disc. Exp.	-0.0068	0.0202	-0.02700	(0.0000)	***
Abn. Prod. Costs	0.0052	0.0161	-0.01090	(0.0600)	*
TRM	0.0003	0.0365	-0.03620	(0.0004)	***

Table 4 – The Effect of Earnouts in Earnings Management

This table reports coeffient estimates from regressions for the period from the first to the third year after completion year, both inclusive, based on robust standard errors. Z-statistics are reported in parentheses. "Disc. Accr." is discretionary accruals, "Abn. Disc. Exp." is abnormal discretionary expenses, "Abn. Prod. Costs" is abnormal production costs " and TRM is Total Real Earnings Management. Earnout" is an indicator variable that takes the value of 1 if the deal involves earnouts and zero otherwise. "Short Period" is an indicator variable that takes the value of 1 if the earnout period is lower than or equal to 1 and zero otherwise. "Medium Period" is an indicator variable that takes the value of 1 if the earnout period is higher than 1.5 and lower or equal than 5, and zero otherwise. "Long Period" is an indicator variable that takes the value of 1 if the earnout period is higher than 5 and zero otherwise. "Relative Size" is the ratio between deal value and lagged total assets. "Size" is the natural logarithm of market value. "Target Public" is an indicator variable that takes the value of 1 if the target firm is a public firm and 0 otherwise. "Cross-border" is an indicator variable that takes the value of 1 if the target is from a country other than USA and 0 otherwise. "Same Industry" is as dummy variable that equals 1 if both acquirer and target belong to the same industry, and zero otherwise. "Leverage" is total debt divided by total assets. "ROA" is return on assets computed as net income divided by lagged toral assets. "Ln(Tot. Assets)" is the natural logarithm of total assets. "M/B" is market-to-book value. "Analyst" is the natural logarithm of 1+number of analysts following the firm (the number of analysts is set to 0 if not reported). "EO(%)" is earnout value divided by total assets in previous year. All variables are defined in Appendix A. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

Panel A – Earnout and earnings management

VARIABLES	Disc. Accr	Disc. Exp	Ab. Prod. Costs	TRM
	(1)	(2)	(3)	(4)
Earnout	-0.0048*	-0.0233***	-0.0082	-0.0307***
	(-1.66)	(-3.97)	(-1.40)	(-2.87)
Relative Size	0.0005	0.0064***	0.0027	0.0072**
	(0.52)	(3.81)	(0.60)	(2.09)
Ln(Tot. Assets)	0.0002	0.0155***	0.0115***	0.0252***
	(0.37)	(10.67)	(7.09)	(9.69)
Public Target	0.0051**	-0.0048	0.0048	-0.0008
	(2.39)	(-1.04)	(0.93)	(-0.09)
Cross-border	-0.0017	-0.0028	-0.0009	-0.0046
	(-0.89)	(-0.73)	(-0.22)	(-0.64)
Same Industry	-0.0054***	-0.0132***	-0.0185***	-0.0303***
	(-3.28)	(-3.77)	(-4.91)	(-4.61)
$Leverage_{t-1}$	0.0106**	0.2186***	0.1625***	0.3738***
	(2.17)	(22.16)	(14.93)	(20.18)
ROA	-0.0202**	0.0954***	-0.1455***	-0.0476*
	(-2.16)	(5.14)	(-7.08)	(-1.77)
M/Bt_{-1}	-0.0011***	-0.0077***	-0.0089***	-0.0160***
	(-3.68)	(-11.26)	(-14.52)	(-13.76)
Analysts	-0.0071***	-0.0300***	-0.0292***	-0.0585***
	(-6.25)	(-12.20)	(-10.70)	(-12.60)
Constant	0.0008	-0.2069***	-0.1372***	-0.3180***
	(0.07)	(-7.87)	(-4.79)	(-6.63)
Observations	11,352	11,241	11,227	11,411
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.0212	0.125	0.0964	0.101

Panel B – Earnout period and earnings management

VARIABLES	Disc. Accr	Disc. Exp	Ab. Prod. Costs	TRM
	(1)	(2)	(3)	(4)
Short period	-0.0116**	-0.0161*	-0.0012	-0.0201
	(-2.38)	(-1.66)	(-0.11)	(-1.01)
Medium period	-0.0071**	-0.0237***	-0.0102	-0.0311**
	(-2.02)	(-3.13)	(-1.38)	(-2.27)
Long period	0.0028	-0.0437**	-0.0250	-0.0692*
	(0.18)	(-2.32)	(-0.99)	(-1.87)
Missing period	0.0222**	-0.0329*	-0.0107	-0.0428
	(2.10)	(-1.68)	(-0.87)	(-1.55)
Relative Size	0.0005	0.0064***	0.0027	0.0072**
	(0.53)	(3.81)	(0.60)	(2.10)
Ln(Tot. Assets)	0.0002	0.0156***	0.0115***	0.0253***
	(0.25)	(10.68)	(7.11)	(9.71)
Public Target	0.0051**	-0.0047	0.0048	-0.0007
	(2.39)	(-1.03)	(0.93)	(-0.09)
Cross-border	-0.0015	-0.0030	-0.0010	-0.0048
	(-0.81)	(-0.76)	(-0.24)	(-0.67)
Same Industry	-0.0055***	-0.0132***	-0.0186***	-0.0304***
	(-3.35)	(-3.79)	(-4.93)	(-4.63)
$Leverage_{t-1}$	0.0107**	0.2185***	0.1623***	0.3736***
	(2.19)	(22.14)	(14.91)	(20.17)
ROA	-0.0190**	0.0951***	-0.1454***	-0.0479*
	(-2.04)	(5.11)	(-7.04)	(-1.77)
M/B_{t-1}	-0.0011***	-0.0077***	-0.0089***	-0.0160***
	(-3.76)	(-11.25)	(-14.51)	(-13.75)
Analysts	-0.0071***	-0.0301***	-0.0293***	-0.0586***
	(-6.24)	(-12.23)	(-10.72)	(-12.62)
Constant	0.0022	-0.2078***	-0.1378***	-0.3193***
	(0.19)	(-7.88)	(-4.80)	(-6.65)
Observations	11,352	11,241	11,227	11,411
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.023	0.125	0.096	0.101

Table 5 – Earnout payment and Earnings Management

This table provides the results of Tobit regressions of earnout payment relative to total earnout amount. EM is a dummy variable that takes the value of 1 if the corresponding earnings management measure value is below its median and 0 otherwise. Control variables are the same as in table 4 and described in appendix A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

VARIABLES	Earnout paid (%)	Earnout paid (%)	Earnout paid (%)	Earnout paid (%)
	(1)	(2)	(3)	(4)
EM (Disc. Accr)	-0.0100			
	(-0.20)			
EM (Ab. Disc. Exp)		-0.1191**		
		(-2.23)		
EM(Ab. Prod.Costs)			-0.1369***	
			(-2.68)	
EM(TRM)				-0.1821***
				(-3.57)
Constant	-0.0128	-0.0496	-0.1674	-0.0706
	(-0.03)	(-0.13)	(-0.46)	(-0.19)
Observations	596	594	597	601
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Pseudo R-squared	0.121	0.127	0.133	0.134

Table 6 – Initial Earnout Payment Method and Earnings Management

This table reports coeffient estimates from regressions for the period from the first to the third year after completion year, both inclusive, with robust standard errors. Z-statistics are reported in parentheses. Subsamples are created according to the form of payment (for non-earnout deals sample) and the corresponding upfront payment (for earnout deals sample). In panel A only single-form of consideration (cash or stock) deals were considered. In panel B only mix-form of consideration (cash and stock) deals were considered. Control variables are the same as in table 4 and defined in Appendix A, and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

Panel A – Earnings management and single upfront/full payment

VARIABLES	Disc. Accr.		Disc. Exp.		Ab. Prod. Costs		TRM	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Only Cash	Only Stock	Only Cash	Only Stock	Only Cash	Only Stock	Only Cash	Only Stock
Earnout	-0.0025	0.0230	-0.0196***	0.0116	-0.0103	0.0716***	-0.0276**	0.0843**
	(-0.79)	(1.62)	(-2.82)	(0.48)	(-1.42)	(3.56)	(-2.10)	(2.23)
Observations	7,549	1,434	7,450	1,432	7,477	1,402	7,583	1,442
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.039	0.053	0.133	0.176	0.114	0.133	0.115	0.131

Panel B – Earnings management and mix upfront/full payment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Mix (>50% cash)	Mix (>50% stock)	Mix (>50% cash)	Mix (>50% stock)	Mix (>50% cash)	Mix (>50% stock)	Mix (>50% cash)	Mix (>50% stock)
Earnout	-0.0204***	0.0032	-0.0234	-0.0324	-0.0250	-0.0001	-0.0418	-0.0328
	(-2.81)	(0.25)	(-1.44)	(-1.42)	(-1.44)	(-0.00)	(-1.38)	(-0.88)
Observations	1,026	660	1,018	667	1,007	656	1,031	669
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.087	0.099	0.230	0.180	0.162	0.178	0.189	0.179

Table 7 –Earnings Management during and after earnout period

This table reports coeffient estimates from regressions for the period from the first to the third year after completion year, both inclusive, with robust standard errors. Z-statistics are reported in parentheses. In panel A for the earnout sample only the years during which earnout was active were considered. In panel B only the years after the earnout expired were considered. Control variables are the same as in table 4 and defined in Appendix A, and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively

Panel A – Earnings management during earnout period

VARIABLES	Disc. Accr	Disc. Exp	Ab. Prod.Costs	TRM
	(1)	(2)	(3)	(4)
Short period	-0.0187**	-0.0197	0.0027	-0.0197
	(-2.23)	(-1.27)	(0.15)	(-0.61)
Medium period	-0.0078**	-0.0262***	-0.0125	-0.0375***
	(-2.03)	(-3.24)	(-1.59)	(-2.59)
Long period	0.0021	-0.0437**	-0.0262	-0.0707*
	(0.14)	(-2.30)	(-1.03)	(-1.90)
Observations	10,880	10,767	10,758	10,935
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.0300	0.121	0.095	0.099

Panel B – Earnings management after earnout period

VARIABLES	Disc. Accr	Disc. Exp	Ab. Prod.Costs	TRM
	(1)	(2)	(3)	(4)
Post-earnout	-0.0066	-0.0157	-0.0060	-0.0203
	(-1.43)	(-1.51)	(-0.51)	(-0.96)
Observations	10,368	10,256	10,252	10,418
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Pseudo R-squared	0.020	0.118	0.095	0.097

Table 8 –Earnouts and Earnings Management: Correcting for Endogeneity

This table reports coeffient estimates from regressions for the period from the first to the third year after completion year, both inclusive, using Heckman (1979) procedure, with robust standard errors. Z-statistics are reported in parentheses. The first-stage regression (equation (1)) estimates the probability of using earnouts. The dependent variables of valuation equations are our earnings management measures."Post-2007" is an indicator variable that takes the value of 1 if the deal is announced after 2007, and 0 otherwise. "Lambda" is the inverse Mill's ratio. Control variables are the same as in table 4 and defined in Appendix A, and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

VARIABLES	Earnout	Disc. Accr	Disc. Exp	Ab. Prod.Costs	TRM
	(1)	(2)	(3)	(4)	(5)
Short period		-0.0116**	-0.0164*	-0.0014	-0.0207
		(-2.38)	(-1.69)	(-0.12)	(-1.04)
Medium period		-0.0071**	-0.0241***	-0.0105	-0.0319**
		(-2.02)	(-3.19)	(-1.41)	(-2.33)
Long period		0.0028	-0.0439**	-0.0251	-0.0695*
		(0.18)	(-2.34)	(-0.99)	(-1.88)
Missing period		0.0222**	-0.0340*	-0.0114	-0.0450
		(2.10)	(-1.74)	(-0.93)	(-1.63)
Lambda		-0.0058	0.0943**	0.0796*	0.1938**
		(-0.31)	(2.34)	(1.82)	(2.55)
Post-2007	0.2969***				
	(8.19)				
Constant	0.3134	0.0076	-0.3073***	-0.2227***	-0.5247***
	(0.91)	(0.35)	(-6.28)	(-4.13)	(-5.71)
Observations	11,550	11,289	11,174	11,166	11,344
Control Variables	Yes	Yes	Yes	Yes	Yes
Year FE	No	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared/R-squared	0.1254	0.023	0.126	0.097	0.102

Table 9 – Earnouts and Earnings Management: CEM Approach

This table reports coefficient estimates from regressions for the period from the first to the third year after completion year, both inclusive, with robust standard errors. Z-statistics are reported in parentheses. **"Earnout"** is a dummy variable that takes the value of 1 if the deal includes an earnout and zero otherwise. Control variables are the same as in table 4 and defined in Appendix A, and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

VARIABLES	Disc. Accr	Disc. Exp	Ab. Prod.Costs	TRM
	(1)	(2)	(3)	(4)
Earnout	-0.0058*	-0.0222***	-0.0063	-0.0289**
	(-1.65)	(-3.14)	(-0.94)	(-2.29)
Constant	0.0253	-0.0669	-0.0601	-0.0860
	(0.62)	(-0.93)	(-0.96)	(-0.73)
Observations	5,222	5,201	5,157	5,252
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.050	0.182	0.172	0.171

Table 10 – Earnout Threshold Definition and Earnings Management

This table reports coeffient estimates from regressions for the period from the first to the third year after completion year, both inclusive, with robust standard errors. Z-statistics are reported in parentheses. **"Target-based threshold"** is an indicator variable that takes the value of 1 if earnout threshold is based on target performance, and 0 for non-earnout deals. **"Acquirer-based threshold"** is an indicator variable that takes the value of 1 if the earnout threshold is based on acquirer or combined firm performance, and 0 for non-earnout deals. Control variables are the same as in table 4 and defined in Appendix A, and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

VARIABLES	Disc. Accr		Disc. Exp		Ab. Prod.Costs		TRM	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Target-based threshold	0.0003		-0.0391***		-0.0170**		-0.0550***	
	(0.08)		(-5.17)		(-2.28)		(-4.01)	
Acquirer-based threshold		-0.0111**		-0.0179*		-0.0018		-0.0234
		(-2.22)		(-1.79)		(-0.19)		(-1.30)
Constant	-0.0054	-0.0097	-0.2043***	-0.2056***	-0.1401***	-0.1374***	-0.3169***	-0.3143***
	(-0.47)	(-0.83)	(-7.65)	(-7.59)	(-4.79)	(-4.65)	(-6.49)	(-6.37)
Observations	10,755	10,473	10,644	10,360	10,636	10,351	10,811	10,523
Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.021	0.022	0.122	0.117	0.095	0.096	0.098	0.097

Table 11 –Earnings Management and Auditor Quality

This table reports coeffient estimates from regressions for the period from the first to the third year after completion year, both inclusive, with robust standard errors. Z-statistics are reported in parentheses. **"Earnout"** is a dummy variable that take the value of 1 if the deal includes an earnout and 0 otherwise. Top Auditor is a dummy variable that takes the value of 1 if the acquirer's audit firm is one of the Big 4, and 0 otherwise. Control variables are the same as in table 4 and defined in Appendix A, and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively

VARIABLES	Disc. Accr.	Disc. Exp.	Ab. Prod. Costs	TRM
	(1)	(2)	(3)	(4)
Earnout	-0.0042	-0.0195***	-0.0110	-0.0299**
	(-1.08)	(-2.69)	(-1.49)	(-2.25)
Top Auditor	0.0003	-0.0091***	-0.0082**	-0.0176***
	(0.20)	(-2.62)	(-2.13)	(-2.66)
Earnout x Top Auditor	-0.0014	-0.0087	0.0071	-0.0012
	(-0.26)	(-0.74)	(0.62)	(-0.06)
Constant	0.0006	-0.2070***	-0.1357***	-0.3166***
	(0.05)	(-7.84)	(-4.72)	(-6.58)
Observations	11,352	11,241	11,227	11,411
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.021	0.126	0.097	0.101

Appendix A - Variables Definitions

Variable	Definition
Firm characteristics:	
Abn. Disc. Exp.	Abnormal discretionary expenses
Abn. Prod. Costs	Abnormal production costs
Analyst	Natural logarithm of 1+number of analysts following the firm (the number of analysts is set to 0 if not reported).
Debt ($MM)	Total debt (in millions of USD)
Disc. Accr.	Discretionary accruals
Leverage	Total debt divided by total assets
Ln(Tot. Assets)	Natural logarithm of total assets.
M/B	The market value of equity divided by the book value of equity.
MV ($MM)	Market value (in millions of USD)
Net income ($MM)	Total net income (in millions of USD)
ROA	Return on assets computed as net income divided by lagged toral assets
Sales ($MM)	Sales (in millions of USD)
Size	Natural logarithm of market value
TA ($MM)	Total assets (in millions of USD)
Target Public	Indicator variable that takes the value of 1 if the target firm is a public firm and 0 otherwise.
TRM	Total real earnings management given by the sum of Abn. Disc. Exp. and Abn. Prod. Costs
Deal characteristics:	
Acquirer-based threshold	Dummy variable that takes the value of 1 if the earnout threshold is based on acquirer or combined firm performance, and 0 for non-earnout deals
Cash+Earnout	Dummy variable that equals 1 if the earnout deal has cash as upfront payment, and zero otherwise.
Cross-border	Indicator variable that takes the value of 1 if the target is from a country other than USA and 0 otherwise.
DV ($MM)	Deal Value (in millions of USD).
DV/MV (Relative Size)	Total deal value divided by lagged total assets
DV/TA	Total deal value divided by market value
Earnout	Dummy variable that takes the value of 1 if the deal involves earnouts and zero otherwise.
Earnout paid (%)	Earnout paid divided by total earnout amount, multiplied by 100.
EO(%)	Amount of earnout consideration divided by the total deal value.
Long Period	Dummy variable that takes the value of 1 if the earnout period is higher than 5 and zero otherwise
Medium Period	Dummy variable that takes the value of 1 if the earnout period is higher than 1.5 and lower or equal than 5, and zero otherwise.
Mix(cash)+Earnout	Dummy variable that equals 1 if the earnout deal has stock and cash (but mainly cash) as upfront payment, and zero otherwise.
Mix(stock)+Earnout	Dummy variable that equals 1 if the earnout deal has stock and cash (but mainly stock) as upfront payment, and zero otherwise.
Owned after deal (%)	Percentage of shares owned by acquirer after the deal is completed.
Post-2007	Dummy indicator variable that takes the value of 1 if the deal is announced after 2007, and 0 otherwise

Internet Appendix

In this appendix we provide two examples of earnout contracts.

CONTRACT 1

AGREEMENT AND PLAN OF MERGER

DATED AS OF JULY 27, 2005

AMONG

INPLAY TECHNOLOGIES, INC.;

FPI ACQUISITION, INC.;

FINEPOINT INNOVATIONS, INC.;

AND

STEPHEN CALDWELL

(…)

(g) Earnout. If Company achieves the Accumulated EBIT calculated during the period commencing on the Merger Date through and including December 31, 2007 (the "Earnout Period"), Company Stockholders shall be entitled to receive additional restricted shares of Buyer Common Stock (the "Earnout Shares"). The Earnout Shares shall be equal to an amount of shares of Buyer Common Stock equal to (a) the First Target Value Earned or Second Target Value Earned, as applicable; divided by (b) the Applicable Buyer Common Stock Price. For purposes of this Section 1.7(g), the following definitions shall apply:

1. "Accumulated EBIT" shall mean the Company's Accumulated Earnings Before Interest and Taxes calculated as follows: net income, plus interest and taxes, plus overhead recorded by Company attributable to general corporate expenses of Buyer, less proceeds recorded by the Company from legal settlements, all components of which shall be recorded in accordance with generally accepted accounting principles.

2. "Average Buyer Common Stock Price" shall mean the average closing price of Buyer's Common Stock, as quoted on the NASDAQ SmallCap Market or other applicable exchange or quotation bureau, for the ten trading days preceding (and including) the last day of the Earnout Period.

3. "First Target Value Earned" shall only apply in the event the Average Buyer Common Stock Price is less than or equal to $5.00 per share, and shall be equal to: (i) (a) Accumulated EBIT, divided by (b) $4,000,000, multiplied by $1,000,000, if Accumulated EBIT during the Earnout Period is equal to or greater than $3,200,000 and less than $4,000,000; or (ii) $1,000,000 if Accumulated EBIT during the Earnout Period is greater than or equal to $4,000,000.

4. "Second Target Value Earned" shall only apply in the event the Average Buyer Common Stock Price is greater than $5.00 per share, and shall be equal to: (i) (a) Accumulated EBIT, divided by (b) $4,000,000, multiplied by $1,500,000, if Accumulated EBIT during the Earnout Period is equal to or greater than $3,200,000 and less than $4,000,000; or (ii)

$1,500,000 if Accumulated EBIT during the Earnout Period is greater than or equal to $4,000,000.

4

(…)

If earned, the Earnout Shares shall be issued by Buyer to Company Stockholders on a pro rata basis based upon such stockholders' ownership of Company Common Stock immediately prior to the Merger Date (the "Allocation Portion").

5. "Accelerated Payments." In the event of a Change of Control (as defined below), then within 15 business days after the occurrence of such Change of Control, Buyer shall issue to Company Stockholders the maximum amount of Earnout Shares that could otherwise be earned by Company Stockholders during the Earnout Period, regardless of whether Company achieved the Accumulated KBIT targets set forth above. For purposes of thisSection 1.7(g), a "Change of Control" shall mean:

(…)

CONTRACT 2

EARN-OUT AGREEMENT

Mentor Graphics Corporation ("Purchaser") and SofTech, Inc. ("Seller") enter into this Earn-Out Agreement ("Agreement") in connection with the Asset Purchase Agreement dated August 30, 2013 between Purchaser and Seller ("Purchase Agreement").

RECITAL

The parties entered into the Purchase Agreement anticipating a closing date of October 10, 2013. The Purchase Agreement required that Purchaser and Seller execute an earn-out agreement as a condition to close. The parties have agreed to enter into this Agreement on the terms set forth below.

AGREEMENT

The parties agree as follows:

1.

Definitions. Unless expressly defined in this Agreement, all capitalized terms shall have the meanings set forth in the Purchase Agreement. The following definitions shall apply to this Agreement:

1.1

“Earn-Out Payments” means those amounts owing to Seller under Section 2.

1.2

“Earn-Out Period” means the period which will terminate on the earlier of the following: (i) the date when the cumulative amount paid as Earn-Out Payments equals $750,000; or (ii) October 31, 2016.

1.3

“Net Revenue” means the net amount of revenue attributable to Seller Products, associated Support Services and Seller Services as recognized by Purchaser in accordance with US GAAP applied in accordance with Purchaser’s then-existing corporate policies, less product returns, royalties paid by Purchaser to third parties for the Seller Products or Seller Services, discounts including but not limited to customer and distributor discounts, and excluding amounts invoiced for any other product, shipping, taxes, duties or other similar amounts.

1.4

“Seller Products” means those software products licensed and supported by Seller prior to Closing, together with new releases and/or derivatives of those products which are released after Closing. For the avoidance of doubt, Seller Products will not include (i) any products generally available from Purchaser prior to Closing or acquired by Purchaser through subsequent acquisitions or (ii) small amounts of code or functionality from Seller Products re-used in Purchaser products to speed product development or enhance product features or interoperability. Seller Products will be assigned a price list level part number as further described in Section 2.

1.5

“Seller Services” means those services provided by Seller prior to Closing that Purchaser will provide for customers of Purchaser after Closing.

1.6

“Support Services” means the standard support packages sold by Purchaser to its customers for the Seller Products, including but not limited to software enhancements and bug fixes provided by Purchaser as part of such standard support packages.

2.

Earn-Out Payments.

2.1

Purchaser will pay Seller Earn-Out Payments, if any, up to a maximum of $750,000, during the Earn-Out Period, subject to reduction or offset under Section 3, in the amount of 10% of the Net Revenues for Seller Products, Support Services and Seller Services. Upon its release of the Seller Products, and in its sole discretion, Purchaser will assign a price list level part number to the Seller Products and any Earn-Out Payments shall only be paid for Net Revenue associated with such part numbers.

2.2

Subject to Section 2.1, if other Purchaser products are bundled with Seller Products resulting in Net Revenue during the Earn-Out Period, Earn-Out Payments will be made based on the pro-rata portion of the Net Revenue attributable to the Seller Product based on the price identified on the Purchaser price list for the Seller Product part number(s) and the Purchaser product part number(s).

E.g., Seller Product part number XX with list price of $200 is bundled with Purchaser products, part numbers YY and ZZ, with list prices of $500 and $300. The Seller Product will be allocated 1/5 of the net product revenue for the bundled product.

2.3

During the Earn-Out Period, Purchaser will prepare quarterly statements setting forth the calculations necessary to determine the amount of the actual Earn-Out Payments to be paid to Seller based on Purchaser's fiscal year. Purchaser shall deliver such statements within 45 days of Purchaser's fiscal quarter end. Earn-Out Payments to Seller are due within 60 days after the end of each of the Purchaser's fiscal years based on the quarterly statements delivered to Seller for that fiscal year provided Seller has provided applicable wire instructions to Purchaser.

2.4

Seller shall have the right to audit Purchaser's relevant books and records to ensure compliance with the terms of this Agreement. Any such audit shall be conducted only by a representative of a nationally recognized independent certified public accounting firm who signs a non-disclosure agreement reasonably acceptable to Purchaser. Purchaser shall be entitled to 30 days written notice to schedule an audit on a mutually convenient date. Audits shall be conducted during normal business hours in such a manner as not to interfere with normal business activities and shall not be made more frequently than annually. The auditor's report shall only confirm compliance or noncompliance with the terms of this Agreement and shall, in no event, include information considered by Purchaser to be confidential.

3.

Purchase Agreement Offsets. Purchaser will be entitled to reduce any unpaid Earn-Out Payments owing to Seller for any Losses on a pro-rata basis if the Holdback has been exhausted or paid to Seller. Any offset of the Earn-Out Payments shall occur in the manner described in Article V of the Purchase Agreement, which is incorporated in this Agreement by reference.

4.

No Representations Regarding Earn-Out Payments. The Earn-Out Payments are speculative in that Purchaser makes no representations, warranties, covenants, promises or guarantees as to the level of efforts it will expend in the development, marketing or sales of the Seller Products. Similarly, Purchaser makes no representations, warranties, covenants, promises or guarantees as to the amount of resulting Net Revenue or the amount of any Earn-Out Payments that may be earned by Seller during the Earn-Out Period. Seller acknowledges that Purchaser may elect not to release the Seller Products for a period of time after Closing. Seller also acknowledges that Purchaser may market and sell the Seller Products at its sole discretion and Purchaser may discontinue all marketing and sales of the Seller Products during the Earn-Out Period for any or no reason.

5.

Amendments and Waivers. This Agreement may not be amended, modified, altered or supplemented except in writing duly executed and delivered on behalf of both parties.

6.

Notices. All notices or other communications required or permitted under this Agreement shall be given in writing and shall be deemed sufficient if delivered by hand (including by courier); mailed by international courier service such as Federal Express, postage prepaid; or sent by email to the following email address for Seller: jmullaney@softech.com. Notices sent to Purchaser should be sent to Mentor Graphics Corporation, Attn: General Counsel, 8005 SW Boeckman Road, Wilsonville, Oregon 97070 or faxed to: (503) 685-1485. Notices may also be sent to such other address or facsimile number as shall be furnished in writing by such party, and any such notice or communication shall be effective and be deemed to have been given as of the date so delivered or, if mailed upon receipt thereof, or if by facsimile on production of a transmission report by the machine from which the facsimile was sent which indicates that the facsimile was sent in its entirety to the facsimile number of the recipient; provided, however, that any notice or communication changing any of the addresses set forth above shall be effective and deemed given only upon its receipt.

7.

Assignment. This Agreement is not assignable by any of the parties without the prior written consent of the other parties, which consent shall not be unreasonably withheld, except that this Agreement and such rights, interests and obligations may be assigned by Purchaser to an affiliate. In the event Purchaser assigns this Agreement to an affiliate, Purchaser shall guarantee performance.

8.

Severability. If any provision of this Agreement or the application of it shall be held invalid, the parties shall amend such provision with a valid provision that comes closest to the original intention of the parties. If the parties fail to amend this Agreement, the invalid provision shall be deemed deleted and the remaining provisions of this Agreement shall continue in full force and effect.

9.

Governing Law. This Agreement shall be governed by and construed in accordance with the laws of Oregon, exclusive of conflicts of law provisions. All disputes arising out of or in connection to this Agreement shall be submitted to the exclusive jurisdiction of the courts in Portland, Oregon, U.S.A. Each of the parties to this Agreement irrevocably waives any and all rights to trial by jury in any legal proceeding arising out of or related to this Agreement or the transactions contemplated by this Agreement.

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