Universidade do Minho
Escola de Economia e Gestão

António Pedro Almeida Antunes Coelho

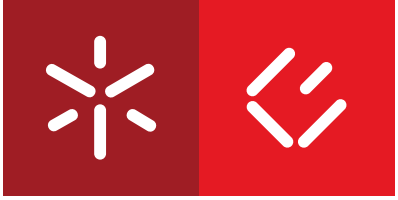
The role of earnouts in Mergers and Acquisitions

July 2025

The role of earnouts in Mergers and Acquisitions

António Pedro Almeida Antunes Coelho

UMinho | 2025



Universidade do Minho
Escola de Economia e Gestão

António Pedro Almeida Antunes Coelho

The role of earnouts in Mergers and Acquisitions

Doctoral Thesis
Ph.D in Management

Thesis conducted under the supervision of
Professor Doutor Gilberto Ramos Loureiro

July 2025

DIREITOS DE AUTOR E CONDIÇÕES DE UTILIZAÇÃO DO TRABALHO POR TERCEIROS

Este é um trabalho académico que pode ser utilizado por terceiros desde que respeitadas as regras e boas práticas internacionalmente aceites, no que concerne aos direitos de autor e direitos conexos.

Assim, o presente trabalho pode ser utilizado nos termos previstos na licença abaixo indicada.

Caso o utilizador necessite de permissão para poder fazer um uso do trabalho em condições não previstas no licenciamento indicado, deverá contactar o autor, através do RepositóriUM da Universidade do Minho.

Licença concedida aos utilizadores deste trabalho



Atribuição
CC BY

https://creativecommons.org/licenses/by/4.0/

To my beloved Daughters, Beatriz and Francisca

To my wife, Elisa

ACKNOWLEDGMENTS

First and foremost, I would like to express infinite gratitude to my supervisor, Professor Gilberto Loureiro. For permanent support and patience, especially when the times of life constrained the times of this thesis. For invaluable incentive and guidance. For all our meetings and discussions, which shaped how I do research. If there is any quality in me as a researcher, I owe it to Professor Gilberto. Almada Negreiros wrote: “I walked into a bookstore. I started counting the books I had to read and the years I had left to live. It wasn't enough!”. My “books” is the debt of gratitude to Professor Gilberto.

I am highly indebted to Sónia Silva for her encouragement and support. For her help and guidance. For always, all the time, believe in me and push me forward. For her sincere and uninterested friendship.

My most emotional thanks to my Family for providing me with all I needed, every moment. For giving me support when, sometimes, they needed it the most. For demanding whenever needed, in the right amount. For enduring all the absences and the “better not” presences. For all the immeasurable love that makes us One.

To Life, for being so generous to me.

STATEMENT OF INTEGRITY

I hereby declare having conducted this academic work with integrity. I confirm that I have not used plagiarism or any form of undue use of information or falsification of results along the process leading to its elaboration.

I further declare that I have fully acknowledged the Code of Ethical Conduct of the University of Minho.

ABSTRACT

This thesis examines the multifaceted role of earnouts in mergers and acquisitions, focusing on their implications for earnings management, executive incentives, deal outcomes, and managerial responsiveness to market feedback. In the first chapter, we investigate whether acquiring firms manipulate earnings during the earnout period to reduce contingent payments to target shareholders. The analysis of completed U.S. deals between 1998 and 2017 reveals systematic downward earnings management, primarily through real activities, particularly in cash-based earnout structures. The second chapter explores how CEO compensation design influences the likelihood of using earnouts in acquisitions. Drawing on a sample of controlling deals from 1998 to 2022, we find that higher pay-performance sensitivity (delta) and risk-taking incentives (vega) are negatively associated with using earnouts, especially in transactions involving private and intangible-intensive targets. In the third chapter, we analyze the effects of earnouts on deal completion, time to closing, and managerial learning from market signals. Using a large dataset of over 19,000 M&A deals, the findings confirm that earnouts enhance completion rates and speed. However, they also reveal that their use is associated with reduced managerial responsiveness to adverse market reactions. Managers are more likely to proceed with poorly received deals and show limited willingness to renegotiate or drop earnouts when conditions change. Collectively, these findings highlight both the contractual benefits and behavioral limitations of earnouts, offering new insights into how contingent payments interact with managerial incentives, governance mechanisms, and market discipline. The thesis contributes to the literature on M&A deal design, incentive alignment, and managerial learning and underscores the importance of monitoring earnout use to safeguard shareholder interests.

Keywords: Mergers and Acquisitions (M&A), Earnouts, Deal Completion, Earnings Management, CEO Compensation, Managerial Learning, Contract Design, Market Feedback, Corporate Governance, Contingent Payments.

RESUMO

Esta tese examina o papel multifacetado dos *earnouts* em operações de fusões e aquisições, com especial enfoque nas suas implicações para a manipulação de resultados, os incentivos dos gestores, a concretização das transações e a capacidade dos gestores de responder aos sinais do mercado. No primeiro capítulo, investigamos se as empresas adquirentes manipulam os resultados durante o período do *earnout* com o objetivo de reduzir os pagamentos contingentes aos acionistas da empresa-alvo. A análise de transações concluídas por adquirentes dos EUA entre 1998 e 2017 revela práticas sistemáticas de gestão de resultados, principalmente através de atividades reais, sobretudo em estruturas de *earnout* baseadas em pagamentos em dinheiro. No segundo capítulo, exploramos em que medida a forma de compensação dos CEOs influencia a probabilidade de utilização de *earnouts* em aquisições. Com base numa amostra de aquisições de controlo entre 1998 e 2022, verificamos que uma maior sensibilidade da remuneração ao desempenho (delta) e incentivos à assunção de risco (vega) estão negativamente associados à utilização de *earnouts*, especialmente em transações que envolvem empresas-alvo privadas e com forte componente de ativos intangíveis. No terceiro capítulo, analisamos os efeitos dos *earnouts* na conclusão das transações, no tempo até à conclusão e na aprendizagem dos gestores com base nos sinais do mercado. Utilizando um extenso conjunto de dados com mais de 19.000 operações de fusões e aquisições, os resultados confirmam que os *earnouts* aumentam as taxas de conclusão e aceleram o processo, mas também revelam que a sua utilização está associada a uma menor sensibilidade dos gestores face a reações negativas do mercado. Os gestores mostram-se mais propensos a prosseguir com negócios mal recebidos e demonstram pouca disposição para renegociar ou eliminar os *earnouts* quando as condições se alteram. Em conjunto, estes resultados evidenciam tanto os benefícios contratuais como as limitações comportamentais dos *earnouts*, oferecendo uma nova perspetiva sobre a forma como os pagamentos contingentes interagem com os incentivos dos gestores, os mecanismos de governação e a disciplina de mercado. A tese contribui para a literatura sobre a estruturação de operações de M&A, a aprendizagem dos gestores e o alinhamento de incentivos, sublinhando a importância de monitorizar o uso de *earnouts* para proteger os interesses dos acionistas.

Palavras-chave: Fusões e Aquisições (F&A), *Earnouts*, Concretização de negócios, Manipulação de resultados, Remuneração dos CEOs, Aprendizagem dos gestores, *Design* de contratos de F&A, Reação do mercado, Governação empresarial, Pagamentos contingentes.

TABLE OF CONTENTS

INTRODUCTION 1

1. EARNINGS MANAGEMENT AROUND EARNOUT-BASED AQUISITIONS 3

1.1. Introduction 3

1.2. Earnout Agreements: Background 7

1.3. Sample, Data, and Methodology 9

1.3.1. Sample and Data 9

1.3.2. Methodology 11

1.4. Empirical Results 15

1.4.1. Earnouts and the practice of earnings management 15

1.4.2. What is the impact of earnings management on the amount of earnout paid? 18

1.4.3. Earnings Management and the Method of Payment in Earnout Deals: Upfront and Total Payment 18

1.5. Robustness tests 20

1.5.1. Refining the identification strategy 20

1.5.2. Addressing endogeneity issues 21

1.5.3. Additional tests 22

1.6. Conclusions 25

Appendix 1.A - Variables Definitions 27

Appendix 1.B – Earnout Contracts 29

Internet Appendix 1 36

2. COMPENSATION INCENTIVES AND THE USE OF EARNOUTS 59

2.1. Introduction 59

2.2. Background And Literature Review 62

2.2.1. Earnouts 62

2.2.2. Compensation Incentives 63

2.3. Sample, Data and Methodology 65

2.3.1. Sample and Data 65

2.3.2. Methodology 67

2.4. Empirical Results 69
2.4.1. CEO Compensation and the Use of Earnouts 69
2.4.2. Uncertainty in target valuation 71
2.4.3. CEO Compensation, earnouts, and stock price reaction 72
2.5. Robustness Tests 73
2.5.1. Addressing selection bias 73
2.5.2. Principal Component Analysis (PCA) 74
2.5.3. Alternative event windows on CARs 75
2.6. Conclusions 76
Appendix 2.A: Definitions and Sources of the Variables 78
Internet Appendix 2 79
3. MANAGERIAL LEARNING IN EARNOUT DEALS 93
3.1. Introduction 93
3.2. Literature review 96
3.3. Sample, Data, and Methodology 98
3.3.1. Sample and Data 98
3.3.2. Methodology 99
3.4. Results 103
3.4.1. Earnout and the likelihood of completing the deal 103
3.4.2. Do managers go deaf when using earnouts? 105
3.5. Robustness tests 107
3.5.1. Controlling for shareholder monitoring 107
3.5.2. Probability of abandoning the earnout 108
3.5.3. Addressing sample selection concerns 109
3.5.4. Refining the identification strategy 110
3.6. Conclusion 110
Appendix 3.A – Variable Definitions 112
CONCLUSION 131
REFERENCES 134

LIST OF TABLES

Table 1.1 – Sample Description 41

Table 1.2 – Descriptive statistics 44

Table 1.3 – Univariate Analysis 46

Table 1.4 – The Effect of Earnouts in Earnings Management 47

Table 1.5 – Earnout payment and Earnings Management 51

Table 1.6 – Upfront and Total Earnout Payment Method and Earnings Management 52

Table 1.7 –Earnings Management during and after earnout period 54

Table 1.8 –Earnouts and Earnings Management: Correcting for Endogeneity 56

Table 1.9 – Earnouts and Earnings Management: CEM Approach 57

Table 1.10 –Earnings Management and Management Retention 58

Table 2.1 – Sample description 82

Table 2.2 – Descriptive statistics 84

Table 2.3 – Earnouts and CEO Compensation 85

Table 2.4 – Earnouts, CEO Compensation and target value uncertainty 86

Table 2.5 – CEO Compensation, earnout and market reaction 88

Table 2.6 – Addressing selection bias: CEM approach 90

Table 2.7 – PCA analysis 91

Table 2.8 – Market reaction: alternative event-windows 92

Table 3.1 – Sample Description 115

Table 3.2 – Descriptive statistics 117

Table 3.3 – Completion Probability 119

Table 3.4 – Completion Time 121

Table 3.5 – Probability of Not Listening 123

Table 3.6 – Probability of Not Listening and Institutional Ownership 125

Table 3.7 – Probability to drop earnout 126

Table 3.8 – Robustness tests: CEM approach 127

Table 3.9 – Exclusion of same-day deals..... 129

INTRODUCTION

Mergers and acquisitions (M&As) represent high-stakes strategic decisions for firms, offering opportunities for growth, diversification, and value creation and exposing acquirers to substantial uncertainty and risk. To address information asymmetries, valuation disagreements, and execution challenges, dealmakers often turn to contractual mechanisms that help align incentives between acquirers and targets. One such tool is the earnout, a contingent payment arrangement in which a portion of the acquisition price is deferred and made conditional on the post-deal performance of the target or combined firm.

Earnouts are particularly useful in settings with high valuation uncertainty, such as when the target is a private firm, operates in an intangible-intensive sector, or is in an early stage of development. By deferring part of the purchase price, earnouts help mitigate adverse selection problems and offer flexibility in deal structuring. Existing research has shown that earnouts can facilitate deal completion (Datar et al., 2001), bridge information gaps (Kohers & Ang, 2000), and even yield higher returns in specific M&A contexts (Barbopoulos & Sudarsanam, 2012; Barbopoulos & Danbolt, 2021). However, despite their increasing use and theoretical appeal, empirical evidence on the broader implications of earnouts – primarily their behavioral, managerial, and governance consequences – remains limited.

This thesis examines earnouts through three distinct but complementary lenses: accounting manipulation, executive incentives, and managerial learning and responsiveness during the M&A process.

The first chapter focuses on how earnouts may inadvertently introduce agency problems. Because earnout payments are typically triggered by financial performance metrics, such as earnings or revenues, acquiring managers may be incentivized to manage earnings downward during the earnout period to reduce or avoid the contingent payment. Analyzing a large sample of completed U.S. deals, the study finds compelling evidence of income-decreasing earnings management by acquirers, primarily through real activities and deals where the earnout is paid in cash. These results highlight the unintended consequences of contingent deal structures on post-acquisition reporting behavior and emphasize the need for greater transparency and contractual safeguards in earnout design.

The second chapter turns to the role of CEO compensation in shaping the decision to use earnouts. It explores how two key dimensions of compensation, delta (sensitivity to stock price changes) and vega (sensitivity to stock return volatility, influence the likelihood of including earnouts in deal contracts. The findings show that CEOs with higher delta are less likely to make deals with earnouts, potentially to avoid diluting their exposure to weaker stock price performance. Similarly, vega is negatively related to earnout use, suggesting that CEOs rewarded for taking risks prefer deals that offer higher upside without

contingent constraints. This chapter contributes to the literature on managerial incentives and M&A design by showing that compensation structures systematically affect deal-making behavior and the contractual form of acquisitions.

The third chapter investigates whether earnouts affect managerial responses to market feedback at the time of deal announcement. Using a comprehensive sample of over 19,000 U.S. M&A deals, the study shows that earnouts increase the likelihood of deal completion and reduce time to closure, confirming their transactional value. However, earnouts also appear to reduce managerial sensitivity to adverse market reactions. Acquirers using earnouts are significantly less likely to abandon or revise deals poorly received by the market. This suggests that earnouts may insulate managers from external discipline mechanisms and hinder adaptive learning. This chapter uncovers a previously overlooked downside of earnout use: while they may help close deals, they can also dampen the feedback between capital markets and corporate decision-making.

The three chapters highlight a central theme: earnouts are powerful but double-edged instruments in M&A transactions. They resolve valuation challenges and facilitate deal-making, but may also incentivize opportunistic behavior and reduce managerial adaptability. These insights contribute to multiple strands of the literature, including M&A contract design, earnings management, executive compensation, and market-based governance. They also carry important policy implications, suggesting that boards, investors, and regulators should scrutinize earnout arrangements for their economic rationale and their potential to impair accountability and responsiveness in high-stakes corporate decisions.

The remainder of the thesis is organized as follows: Chapter 1 investigates the link between earnouts and earnings management during the earnout period. Chapter 2 examines how CEO compensation incentives shape the decision to use earnouts in acquisitions. Chapter 3 analyzes the effects of earnouts on deal completion, timing, and managerial learning from market reactions to deal announcements. Finally, the Conclusion combines the findings and discusses their implications for theory and practice.

1. EARNINGS MANAGEMENT AROUND EARNOUT-BASED AQUISITIONS

1.1. Introduction

Earnouts can be defined as a risk-allocation mechanism used in mergers and acquisitions (M&As), where a portion of the acquisition payment is deferred and contingent 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 an effective tool for reducing the cost of adverse selection in deals with higher levels of uncertainty about potential synergies and larger information asymmetry between bidders and targets. By accepting earnout-based deals, sellers not only signal confidence in the good prospects of the combined firm but also demonstrate a willingness to put some "skin in the game", which can resolve potential pre-deal valuation disagreements between bidders and targets (Datar et al., 2001; Cain et al., 2011; Cadman et al., 2014). For example, consider a target firm in the pharmaceutical industry that is still awaiting approval for a new drug at the time of the deal. Even if the target's management is confident in receiving approval, it may be difficult to convince the bidder. As a result, the target prices the sale based on anticipated revenue from the new drug, while the bidder is hesitant to do so. Including an additional payment contingent on regulatory approval or meeting a sales threshold helps 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. Unsurprisingly, earnouts are more common in deals with higher uncertainty about the target value and the future prospects of the combined firm (Cain et al., 2011; Kohers & Ang, 2000; Ragozzino & Reuer, 2009). Deals involving contingent payments also tend to yield higher returns for acquirers compared to those paid in full upon completion (Kohers & Ang, 2000; Barbopoulos & Sudarsanam, 2012; Barbopoulos & Adra, 2016; Barbopoulos et al., 2017).

Although appealing in theory, earnouts are not 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, while 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 presents some challenges[1]. Both parties should fully understand earnout agreements, ensure clarity in the measures of underlying events that trigger payments, and, as much as possible, base them on objective variables less susceptible to discretionary adjustments. As pointed out by Viarengo et al. (2018), earnouts, which are originated from a disagreement, may also lead to conflict. Most payment triggers are tied to post-deal earnings, which can be affected by earnings management practices with the purpose of avoiding full payment of the acquisition.

In this study, we analyze the relationship between the use of earnouts in M&A deals and the practice of earnings management by acquirers, considering their potential incentive to reduce contingent payments. Specifically, 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?

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 because these agreements feed on uncertainty and are likely to distort managers' incentives with negative consequences for shareholders. Although the authors acknowledge that most earnout 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 into 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. Because the threshold that triggers the earnout payment is usually based on accounting measures (Cain et al. (2011), there is an incentive for managers

[1] See Appendix 1.B for examples of earnout contracts.

to avoid or reduce the contingent payment through earnings management. Our main hypothesis in this study is that managers of the combined firm will engage in downwards earnings management 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 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.

This evidence is consistent with the notion that managers controlling the combined firm post-acquisition – who are ultimately responsible for managerial decisions and financial disclosure –have a strong incentive to avoid or reduce contingent payments. As a result, they have an incentive to engage in earnings management to manipulate accounting figures throughout the earnout period, which should be reflected in the consolidated accounts of the combined firm.

Chances are that bidder managers favor real rather than accrual-based earnings management, especially with longer earnout periods, because real manipulation is harder to detect and carries lower litigation risk postacquisition. Bidder managers indeed face a trade-off when attempting to manipulate earnings downward to reduce the likelihood of paying the full earnout. During the earnout period, the seller typically closely monitors the target firm's performance and accounting practices, so the risk of litigation may discourage acquirers from engaging in easily detectable earnings manipulation or from reducing effort to meet the earnout targets.

The literature offers several examples supporting this claim. For instance, 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 is likely to have a long-lasting effect – activities undertaken in the current period not only influence current earnings but also impact earnings in future periods[2]. A real

[2] 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 before a seasoned equity offer increase the risk of a stock price crash; the impact being greater when the manager engages

activity undertaken at a specific point in time to reduce earnings can affect financial performance throughout the earnout period. This practice can be particularly effective in avoiding contingent payments because earnout agreements require either a single payment at the end of the period or partial payments throughout.

We further explore whether some deal characteristics, such as the type of payment made in earnout deals – either upfront or total payment – affect the practice of earnings management. Our findings show that when the upfront payment is made in stock, managers do not manipulate earnings downwards 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. These practices result in acquirers paying, on average, between $3,5 and $5,25 million less for the deal.

The literature offers some possible explanations for this result. First, if target shareholders receive stocks from the acquiring company, they not only have the incentive but also the power to closely monitor the managers of the combined firm, increasing the risk of being detected. Second, in stock-based acquisitions, bidder managers often engage in aggressive upward accrual-based earnings management before the deal (e.g., Erickson & Wang, 1999; Botsari & Meeks, 2008; Louis, 2004; Gong et al., 2008; Loureiro & 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. We find a similar pattern of results when analyzing the full earnout payment (cash *versus* stock) rather than just the upfront 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 provide insight into which deal and earnout contract characteristics – namely, the method of payment of earnout agreements – are more likely to influence the practice of earnings manipulation in its various forms. This result has important policy implications because 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

in real rather than accrual-based earnings management. Similarly, Alhadab et al. (2015) for a sample of U.K. IPOs find that real earnings management is more associated with IPO failure risk (i.e., lower survival rates) than accrual-based earnings management.

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 before stock-for-stock acquisitions (Erickson & Wang, 1999; Botsari & Meeks, 2008; Louis, 2004; Gong et al., 2008).

1.2. 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 predefined goal[3]. 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 increasing from 1.3% in 1985 to 3.5% in 1998 (Bruner & 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 & Ang, 2000). Without earnout arrangements, some deals could be abandoned because 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 because some value-creating deals would be left out. Not surprisingly, many studies show that earnouts are more commonly used when target firms operate in industries that invest heavily in intangible assets, such as high-tech or service industries. Kohers and Ang (2000) report that deals involving targets in the high-tech industry are 70% more likely to include earnouts than deals in other industries; also, deals in the services sector are 86% more likely to use earnouts than those in non-services sectors.

The use of earnouts is also more attractive when acquirers target private firms. Valuing private firms can be quite challenging due to poorer quality financial information and higher levels of information asymmetry. State-contingent payments are a useful tool to resolve potential valuation disagreements about private firms in M&A deals. In fact, Ewelt-Knauer et al. (2018) report that 92% of targets in earnout deals are private firms.

[3] 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).

The most common earnout periods range from one to three years but can extend up to 15 years, as observed in our sample. Several factors are likely to influence the length of an earnout period. Longer earnout periods are expected in industries where valuation uncertainty is more severe and takes longer to resolve, as is the case in R&D-intensive industries (e.g., pharmaceutical). In contrast, earnout periods tend to be shorter when expected returns in the target industry are more uncertain because 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 deferred payment. Naturally, the proportion of the deferred 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 and see" if the seller's valuation proves to be accurate. Additionally, targets will accept a higher relative earnout size if they are (overly) confident in their future performance (Kohers & 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), although it can vary significantly – in rare cases, the full deal value can be set up as a contingent payment. Other factors, such as bidder financial constraints can 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 a 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. Because earnout triggers are commonly based upon financial measures (e.g., sales and earnings), managers can be tempted to engage in earnings management to influence the earnout payment (Ragozzino & Reuer, 2009; Eckbo, 2009; Lukas et al., 2012; Viarengo et al., 2018). It is not to say that the parties involved in M&As with earnout payments are unaware 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 that influences 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 contingent payment.

In this study, we answer some of the questions raised in 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 monitor, the method of payment), the use of earnouts in M&As creates incentives for bidding managers to manipulate earnings downwards post-acquisition in order to avoid the contingent payment.

1.3. Sample, Data, and Methodology

1.3.1. 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 two and three years (Cain et al., 2011), we end our sample period in 2017 to guarantee at least three 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[4]. 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 metrics, were hand-collected from the SEC[5] 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.

[4] 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.

[5] https://www.sec.gov/edgar.shtml

We end up with 517 deals involving earnouts and 3,928 deals without earnouts. Panel A of Table 1.1 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[6]. 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 deals with earnouts have cash as first payment (58%), and only a few are pure earnout deals (0.1% of the full sample and 0.5% of deals with earnouts). These numbers support the idea that earnouts are used as complement rather 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)[7]. There are 461 deals for which we have information on the length of the earnout period. Again, in line with prior studies, about 81% of the deals have an earnout period up to three 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 352 deals (out of the total 517): 30% of acquirers paid less than 10% of the earnout, and 19% paid more than 90% of the agreed value. In 57.4% of deals, more than half of the 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)[8].

[Insert Table 1.1 here]

Table 1.2 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

[6] 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 SFAS 141 (R).

[7] 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.

[8] Viarengo et al. (2018) cite anecdotal evidence that earnouts, which are designed to resolve disagreements about the price to pay for a target, may indeed lead to litigation post-acquisition. The study references a survey conducted by a law firm, with responses from more than 300 M&A professionals. The vast majority of participants indicated that earnout clauses are prone to disputes or litigation. Approximately 20% of respondents estimated that litigation occurred in about half of all earnout deals.

(median) earnout portion of the total deal value is 32.01% (26.32%), and the mean (median) deal value is $103 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 earnout contracts serve to overcome information asymmetry problems, which are more severe in these types of firms[9].

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

[Insert Table 1.2 here]

1.3.2. 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[10].

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

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

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 estimated parameters from Equation (1), we estimate the nondiscretionary accruals (fitted values):

[9] 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.

[10] All our measures of earnings management are signed so negative coefficients mean downward earnings management.

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

We finally obtain the discretionary accruals, as the proxy for the firm earnings management, from the difference between actual and fitted values:

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

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

Alternatively, managers can use overproduction (underproduction) to inflate (deflate) earnings artificially. 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. To increase (decrease) production level, however, firms will face additional (fewer) production and holding costs, resulting in higher (lower) production costs relative to sales and lower (higher) cash flow from operations. Thus, higher production costs are associated with upward earnings management and vice-versa.

Production costs are expressed as the sum of COGS and change in inventory. COGS is modeled as:

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

And changes in inventory (ΔInv) are modeled as:

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

[11] As noted by Roychowdhury (2006), abnormal cash flow to operations (CFO) is influenced 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.

Equation (6), resulting from the combination of Equations (4) and (5), is used to estimate the normal levels of production costs:

$$\frac{\text{Prod}_{i,t}}{\text{TA}_{i,t-1}} = k_0 + k_0 \frac{1}{\text{TA}_{i,t-1}} + k_1 \frac{\text{SALES}_{i,t}}{\text{TA}_{i,t-1}} + k_2 \frac{\Delta\text{SALES}_{i,t}}{\text{TA}_{i,t-1}} + k_3 \frac{\Delta\text{SALES}_{i,t-1}}{\text{TA}_{i,t-1}} + \varepsilon_{it} \quad (6)$$

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 the fitted values from Equation (6) and the actual production costs.

Finally, the normal level of discretionary expenses is estimated using the following model:

$$\frac{\text{DiscExp}_{i,t}}{\text{TA}_{i,t-1}} = \alpha_0 + \beta_1 \frac{1}{\text{TA}_{i,t-1}} + \beta_1 \frac{\text{SALES}_{i,t-1}}{\text{TA}_{i,t-1}} + \varepsilon_{it} \quad (7)$$

DiscExp are discretionary expenses defined as the sum of R&D (research and development) and 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), Zang (2012) and Huang and Li (2024), 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 to 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:

$$\begin{aligned} \text{EM}_{it} = \alpha + \beta_1 \text{Earnout}_i + \beta_2 \text{RelativeSize}_i + \beta_3 \text{TA}_{it} + \beta_4 \text{PublicTarget}_i \\ + \beta_5 \text{CrossBorder}_i + \beta_6 \text{SameIndustry}_i + \beta_7 \text{Leverage}_{it-1} + \beta_8 \text{ROA}_{it} + \\ \beta_9 \text{MTB}_{it} + \beta_{10} \text{Analyst}_{it} + \mu_t + \lambda_j + \varepsilon_{it} \end{aligned} \quad (8)$$

EM is our measure of earnings management – either discretionary accruals (Disc. Accr.), abnormal discretionary expenses (Ab. Disc. Exp.), abnormal production costs (Ab. Prod. Costs), or the sum of the

two measures of real earnings management (TRM); *Earnout*, our variable of interest, is a binary 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; *MTB* is the ratio between the market value of equity and the book value of equity; *Analysts* is the natural logarithm of one plus the number of analysts following the firm (set to zero if not reported). In all regressions, we control for year (μ_t) and industry (λ_j) fixed effects.

According to the literature, managers choosing between accrual-based and real earnings management weigh the firm's ability and the risks involved (Cohen & Zarowin, 2010; Zang, 2012). Accrual manipulation faces higher scrutiny, while real earnings management is harder to detect (Cohen et al., 2008). We then test whether the earnout length influences this choice: shorter periods are more likely to favor accrual-based methods due to their immediacy and lack of operational impact, while longer earnout periods can increase the use of real activities manipulation due to lower detection risk. To test this, we replace our variable "Earnout" in Equation (8) by three 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, i.e., we create subsamples of earnout deals according to their initial form of payment (cash or stock) 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). We repeat the analysis focusing on whether not only the upfront portion but the total earnout payment is in cash or stock.

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:

$$\begin{aligned}\text{Earnout paid }(\%)_{it} = \alpha + \beta_1 \text{EM}_{it} + \beta_2 \text{RelativeSize}_i + \beta_3 \text{TA}_{it} + \beta_4 \text{PublicTarget}_i \\ + \beta_5 \text{CrossBorder}_i + \beta_6 \text{SameIndustry}_i + \beta_7 \text{Leverage}_{it-1} + \beta_8 \text{ROA}_{it} + \\ \beta_9 \text{MTB}_{it} + \beta_{11} \text{Analyst}_{it} + \mu_t + \lambda_j + \varepsilon_{it}\end{aligned} \quad (9)$$

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 zero and right censored at one. The variable of interest, *EM*, is a binary variable equal to one if the earnings management proxy is below its median and zero otherwise.

1.4. Empirical Results

1.4.1. 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 1.3, we test the difference in means and medians 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 (Panel D). We compute the difference in means and medians for each earnings management proxy between earnout and non-earnout deals. 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.) 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 1.3 here]

We find evidence of earnings management post-acquisition (up to three years) by firms that use earnouts. Panel A of Table 1.3 shows that managers seem to rely on accruals to lower reported income only in the first year after deal completion, likely because this practice is the easiest way to manipulate earnings in the short term. Additionally, given the positive correlation between the size of the earnout (as a percentage of the total deal value) and the earnout length, accounting manipulation can be sufficient to avoid or reduce the relatively small earnout payments.

The difference in means (medians) of signed accrual-based earnings management between the earnout sample (with a period of one year) and the non-earnout sample is -97 basis points (-103 bps), both statistically significant, meaning that managers manipulate earnings downwards one year after the deal when earnouts are involved. These differences are also economically significant since they represent a percentage of total assets. The differences in real earnings management in general, and discretionary expenses in particular, between deals involving earnouts and those without earnouts are also negative

(and statistically significant at the 1% or 5% level) throughout the periods, indicating that for longer earnout periods, managers feel the need to engage in earnings manipulation right from the beginning. The difference in means (medians) of discretionary expenses ranges from -251 basis points (-204 bps) in period 3 and -293 bps (-232 bps) in period 2 (1). The weaker results on abnormal production costs suggest that managers may use them as last resource, which could be related to their longer-term effects on firm performance.

Taking the three-year period altogether (Panel D of Table 1.3), we find that the differences in means and medians of our proxies for real earnings management are all negative and statistically significant. The results are also economically significant: for example, the mean (median) total real earnings management (TRM) of earnout deals is 362 bps (340 bps) lower than that of their non-earnout counterparts – a difference that is larger in magnitude than the average TRM of the full sample (2.92%). Interestingly, the magnitudes of the differences in means and medians among measures of real earnings management are considerably higher than those for accrual-based earnings management.

Overall, our first set of results clearly indicates downward earnings management by acquirers that use earnouts as a form of payment, with a higher incidence of real earnings management, especially over longer earnout periods.

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 1.4. 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 using earnouts to pay for the acquisitions tend to deflate their earnings post-deal compared to non-earnout acquirers. The magnitude of this effect is also economically significant. Earnings are managed downwards by increasing Discretionary Expenses by 233 bps in earnout deals compared to our control sample of non-earnout deals, *ceteris paribus*; this impact 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 300 bps, representing 1% of its full sample mean.

Additionally, the impact of earnouts on post-deal discretionary accruals, although negative, is statistically significant at the 10% significance level. Taken together, these results indicate that managers

rely more on real activities to manipulate earnings than on accruals, likely because real activities are harder to detect, more difficult to control, and easier to justify[12].

[Insert Table 1.4 here]

Accrual-based earnings management tends 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 unsuitable for longer periods. We then test whether the length of the earnout period affects managers' incentives to engage in accrual-based *versus* real earnings management. To do so, we re-estimate our main Equation (8) including "*Short Period"* (a categorical variable that takes the value of one 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 one if the earnout period is greater than 1.5 years and lower or equal than five years, and zero otherwise) and "*Long Period*" (a categorical variable that takes the value of one if the earnout period is longer than five years, and zero otherwise) as additional control variables.

The results, presented in Panel B of Table 1.4, show that short-period earnouts are more associated with negative discretionary accruals than with the measures of real earnings management. 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. This effect supports the idea that managers have little incentive or opportunity to manipulate earnings through real activities over shorter periods.

For medium-term earnouts (between 1.5 and 5 years), we find a negative and statistically significant impact on either discretionary accruals, discretionary expenses, and total real earnings management. In contrast, for longer-period earnouts, we only find evidence of the practice of downward real earnings management (measured by discretionary expenses or *TRM*), but not discretionary accruals, associated with earnout deals. These results suggest that for longer earnout periods, acquirers manage earnings primarily in the early years rather than maintaining the same intensity throughout the entire earnout period. One possible reason is that intensive earnings management in the first year could be sufficient to

[12] In an unreported analysis, we find further support of these findings; namely, when the earnout metric is based solely on sales (which can be manipulated only through accruals), we do not find statistically significant evidence of earnings manipulation.

[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.

reduce the earnout payment[14], making it unnecessary to extend the practice over a longer period, increasing the risk of detection.

1.4.2. 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[15]. 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 one 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 1.5 here]

The results, presented in Table 1.5, suggest that managers who 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 (TRM). The economic magnitudes are also relevant. Taking model (4) as an example, bidders that engage more intensively in real downward earnings management pay, on average, 18% less of the total earnout, which, based on the average earnout amount, corresponds to a dollar amount of $5.25 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.

1.4.3. Earnings Management and the Method of Payment in Earnout Deals: Upfront and Total Payment

In this section, we first analyze whether the type of upfront payment (cash or stock) in deals with earnouts has any effect on bidder managers' incentives to manipulate earnings post-deal as an attempt

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

[15] Almost all earnout payments are structured on an "all-or-nothing" basis, depending on whether the predefined threshold is met. Nonetheless, many earnout payments, along with their corresponding thresholds, are defined on a periodic basis. This means that some companies may fail to meet the threshold in certain periods, resulting in only a fraction of the total earnout value being paid.

to reduce the agreed future contingent payments. Barbopoulos et al. (2017) study the relevance of initial payment in acquirers' gains and find that when 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. In a later study, Barbopoulos and Danbolt (2021) show that acquirers earn higher returns in earnout deals when the contingent payment is around 30% of the deal value.

[Insert Table 1.6 here]

In Table 1.6, Panel A, we investigate whether the type of upfront payment impacts the practice of earnings management post-earnout deals and whether this impact is different depending on the type of earnings management – based on accruals *versus* real activities. Specifically, we create subsamples based the form of payment, separating earnout deals with an upfront payment in cash from those with an upfront payment in stock. The counterfactuals assigned to each group are non-earnout deals fully paid in cash or stock, respectively[16]. We then estimate Equation (8) for each group based on the type of payment. As before, our variable of interest is *Earnout*, an indicator variable equal to one if the deal involves an earnout, and zero otherwise.

The results show a negative and statistically significant impact of using earnouts on discretionary expenses (column 3) and 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 – 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, 716 bps higher abnormal production costs than their non-earnout counterparts who paid their acquisitions with stock. This evidence suggests that when sellers become shareholders of the acquiring firm, they monitor managers more closely, preventing them from engaging in practices that would jeopardize the achievement of the earnout threshold. In fact, in line with Elnahas et al. (2017), results even suggest that the pressure put by these new shareholders increases the likelihood of achieving the earnout threshold.

Next, we extend our analysis to the total earnout payment rather than just the upfront payment. We follow the same procedure and separate earnouts fully paid in cash from those paid in stock. The results

[16] For example, in Panel A, earnout deals, which upfront payment is in cash (stock), are compared against cash-(stock)only non-earnout deals; in Panel B, earnout deals with both upfront and subsequent payments in cash (stock) are compared against cash-(stock)only non-earnout deals.

in Table 1.6, Panel B, show evidence of downward real earnings management only when the earnout is fully paid in cash. This evidence is consistent with the idea that cash flow preservation (by avoiding earnout payments) is an incentive for managers to manipulate earnings, mainly through real activities.

Additionally, we provide a more direct test on how earnings management post-earnout deals impacts cash flows. On average, we find that downward earnings management is associated with higher levels of free cash flow-to-assets, particularly when earnouts are paid in cash. These results suggest that bidder managers engage in earnings management to avoid earnout payments and in doing so are able to preserve cash. This incentive does not exist when stock is used as a method of payment because stockholders are the residual claimants on cash flow. These results are presented in Table IA.1.1 of the Internet Appendix[17].

Overall, we can conclude that both the type of upfront and subsequent payment(s) in earnout deals are key to understanding the bidder's managerial incentives with respect to earnings manipulation.

1.5. Robustness tests

1.5.1. 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's incentive to reduce the contingent payment no longer exists. If our identification strategy is accurate, we do not expect to find any difference in our earnings management measures between deals with and without earnouts for the years after the earnout period ends because the incentives to engage in such practices (avoiding the earnout payment) no longer exist. 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.

[17] In Table IA.1.1, we estimate an alternative version of our main regression models, using free cash flow-to-assets as the variable of interest. The models are estimated on the subsample of earnout deals. A negative coefficient on the variable of interest indicates that downward earnings management positively impacts cash flow.

In Table 1.7, 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 1.7 here]

The results from Panel A are similar to those in Table 1.4 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 1.4) 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 accrual-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) seems to be preferred when earnouts last between 1.5 years and 5 years.

The results in Panel B of Table 1.7 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.

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

1.5.2. Addressing endogeneity issues

We recognize the endogenous nature of earnings management decision and the use of earnout arrangements in acquisitions. Although sellers of acquisitions with earnouts might investigate the practice of earnings management by the acquirer before the deal (Prencipe and Viarengo (2022), it is reasonable to consider that bidders that are more prone to engage in earnings management are also 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-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 common ground between

bidders and targets, and bring the deal to a close. 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 1.4, 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 1.8 here]

Table 1.8 reports the results. As expected, in column (1) the binary variable *Post-2007* 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 1.4. Overall, these results are consistent with our main prediction that firms using earnouts in M&As 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)[18]. CEM divides the sample firms into bins based on each chosen covariate and then matches on the strata. We base our matching procedure on the following covariates: deal size, one-year lagged total assets and sales, and binary variables to identify cross-border deals, public targets, year, and industry. We then re-estimate our main models, similar to Table 1.4 (Panel A), using the treated and the control samples. The results shown in Table 1.9 are similar to what we uncovered above, meaning that our conclusions remain unchanged.

[Insert Table 1.9 here]

1.5.3. Additional tests

[18] If we use Propensity Score Matching (PSM) instead of CEM our conclusions remain unchanged although CEM preserves significantly more observations than PSM. We choose to report CEM results as it is proven to be a more powerful method (Spolaore & Le Moign, 2023; Iacus et al., 2012).

In many earnout deals, target managers are retained and incentivized to run the subsidiary after the deal is completed[19]. In such situations, it is expected that acquirers will face more informed inside monitoring and scrutiny, making it more difficult to engage in unnoticed downward earnings management. Therefore, we should expect higher levels of earnings management when target managers leave the company compared to when they are retained. To test this prediction, we first identify, for each earnout deal, whether the target management was retained or left the company after the acquisition. We then decomposed the variable "Earnout" into two categories: "*Earnout with Retained Target Mngmnt*" and "*Earnout without Retained Target Mngmnt*". In line with Cadman et al. (2014) and Kepler et al. (2023), we searched on SEC filling (including earnout contracts) and LinkedIn pages to find information about target management retention. We were able to find information for 248 earnout deals; in 75% of the cases (186 earnout deals), target management remained in the company post-acquisition. This proportion is identical to the one reported by Kepler et al. (2023). Observations for which we could not identify whether the target management was retained or not were dropped.

In Table 1.10 we estimate our main regressions (as in Table 1.4) with these two new binary variables, which add up to the variable "Earnout". The intercept captures non-earnout deals. The results suggest that acquirers engage in downward real earnings management even when target managers are kept after the deal[20], though to a lesser extent compared to cases where target managers leave the company. The coefficients on "*Earnout without Retained Target Mngmnt"* are negative and statistically significant for all measures of real earnings management, and of greater magnitude than the coefficients on "*Earnout with Retained Target Mngmnt*". The difference between these coefficients is also statistically significant. Interestingly, we find that when target managers stay in the firm, unlike when they leave, there is no evidence of earnings management through abnormal production costs, suggesting that retained target managers maintain greater control and scrutiny over production activities.

On the contrary, acquirers seem to engage in more aggressive downward accrual-based earnings management when target managers are retained. This result seems to suggest that acquirers tend to substitute real by discretionary earnings management when target managers are retained, possibly because target managers have less control and monitoring ability over the latter.

[19] We thank an anonymous referee for suggesting this analysis.

[20] The evidence of downward earnings management even when target managers stay doesn't surprise as it is quite common that managers leave before the earnout period ends, in conflict with acquirer management. We also cannot rule out the possibility that target managers become captured by acquirers. (Gogineni and Puthenpurackal (2014) present evidence of conflicts of interest between target management and shareholders in buyout negotiations).

[Insert Table 1.10 here]

In the Internet Appendix, we present two additional robustness checks.

First, we test whether earnouts which thresholds are based on the target's or bidder's performance measures lead to different conclusions. In Table IA.1.2, we re-estimate our main models separately for deals with earnout thresholds based on targets or bidders. The results show that earnout deals with target-based thresholds are associated with negative earnings management through real activities post-deal. This evidence alleviates possible concerns that acquiring firms' accounts are unable to reflect earnings management made through the target firms post-acquisition. These results support the idea that earnings management in the acquired firms is reflected in the acquiring firms' accounts through accounting consolidation. It is not uncommon for ultimate parent companies to 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. As for earnouts with thresholds based on the acquirer's performance, there is weak evidence of earnings manipulation, which can be explained not only by the lower incidence of such deals in the sample, but also by the more stringent public scrutiny that bidder accounts are subject to (Shuto, 2009; Aharony et al., 2010; Bonacchi et al., 2018).

Second, 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 binary variable Top Auditor that takes the value of one if the buyer's auditor is one of the Big 4, and zero otherwise[21]. 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 IA.1.3 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 that our results are driven by the acquirer auditor's quality rather than the use of earnouts.

[21] 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.

1.6. Conclusions

Earnouts allow the parties involved in acquisitions to close a deal when uncertainty about the prospects of the target (and thus its value) is more severe. Because what triggers contingent payments are performance measures usually based on accounting metrics, there is room and incentives to manipulate accounting figures. In this study, 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 their payment. Although earnings management has been referred to as a potential negative consequence of using earnouts, empirical studies including a broader sample of deals and different types of targets are nonexistent. In our study, we use a sample of 517 earnout-using firms and a control group of 3,928 firms that do not 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 (or the total) 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 a 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 because they are found in the first year post-deal and are associated with shorter earnout periods.

We also provide evidence that, through earnings management, buyers achieve their objective as they pay, on average, less 13% of the total earnout amount. As an additional analysis, we test whether retained target management interferes with the acquirer's ability to manipulate earnings. We find that real earnings management exists independently of target management retention but is significantly less pronounced when target managers are retained post-acquisition.

Our study is relevant for informing policy because it sheds light on potential drawbacks of using earnouts, particularly in cash deals, and highlights areas where action is needed (e.g., enforcing monitoring, disclosure, or incentives mechanisms) to prevent manipulation of earnout triggers. Policies directed to mitigate earnings manipulation in the years following earnout deals can have a significant impact on restoring confidence in earnout arrangements and make this a more powerful tool to facilitate value-creating deals that would otherwise be left out. Making these arrangements more reliable 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.

Appendix 1.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 ($MM)	Total assets (in millions of USD)
Target Public	Binary variable that takes the value of one if the target firm is a public firm and zero otherwise.
TRM	Total real earnings management given by the sum of Abn. Disc. Exp. and Abn. Prod. Costs
Deal characteristics:	
Acquirer-based threshold	Binary variable that takes the value of one if the earnout threshold is based on acquirer or combined firm performance, and zero for non-earnout deals
Cross-border	Binary variable that takes the value of one if the target is from a country other than USA and zero otherwise.
DV ($MM)	Deal Value (in millions of USD).
DV/MV (Relative Size)	Total deal value divided by lagged total assets

Appendix 1.A - Variables Definitions (cont'd)

DV/TA	Total deal value divided by market value
Earnout	Binary variable that takes the value of one 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	Binary variable that takes the value of one if the earnout period is higher than five and zero otherwise
Medium Period	Binary variable that takes the value of one if the earnout period is higher than 1.5 and lower or equal than five, and zero otherwise.
Owned after deal (%)	Percentage of shares owned by acquirer after the deal is completed.
Post-2007	Binary indicator variable that takes the value of one if the deal is announced after 2007, and 0 otherwise

Appendix 1.B – Earnout Contracts

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.

Internet Appendix 1

Table IA.1.1 – Earnings Management and Cash Flows

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year. The sample includes only earnout deals. The variable of interest is the free cash flow to the firm divided by total assets. Control variables (omitted for brevity) are the same as in Table 1.4 and defined in Appendix 1.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses; ***, ** and * mean statistical significance at the 1%, 5%, and 10% significance levels, respectively.

VARIABLES	Disc. Accr.	Abn. Disc. Exp.	Abn. Prod. Costs	TRM
	(1)	(2)	(3)	(4)
Free Cash Flow-to-Assets	-0.2112***	-0.0566	-0.1178**	-0.1893***
	(-3.37)	(-1.61)	(-2.34)	(-2.83)
Constant	0.1493***	-0.0660	0.1928**	0.1092
	(3.30)	(-0.91)	(2.36)	(0.82)
Observations	1,299	1,297	1,289	1,306
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.216	0.275	0.198	0.239

Table IA.1.1 – Earnings Management and Cash Flows (Cont'd)

Splitting samples:				
(1) Coefficients on FCF-to-assets for deals fully paid in Cash (#Deals: 742)				
Free Cash Flow-to-Assets	-0.4078***	-0.039	-0.1591**	-0.196
	(-6.84)	(-0.42)	(-2.37)	(-1.44)
(2) Coefficients on FCF-to-assets for deals fully paid in Stock (#Deals: 51)				
Free Cash Flow-to-Assets	-0.0414	-0.0856	-0.1194	-0.241
	(-0.24)	(-0.49)	(-0.82)	(-0.80)

Table IA.1.2 – Earnout Threshold Definition and Earnings Management

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year. "Target-based threshold" is an indicator variable that takes the value of one if earnout threshold is based on target performance, and zero for non-earnout deals. "Acquirer-based threshold" is an indicator variable that takes the value of one if the earnout threshold is based on acquirer or combined firm performance, and zero for non-earnout deals. Control variables (omitted for brevity) are the same as in Table 1.4 and defined in Appendix 1.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses; ***, ** 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

Table IA.1.2 – Earnout Threshold Definition and Earnings Management (cont'd)

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	0.021	0.022	0.122	0.117	0.095	0.096	0.098	0.097

Table IA.1.3 – Earnings Management and Auditor Quality

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year. "Earnout" is a binary variable that takes the value of one if the deal includes an earnout and zero otherwise. "Top Auditor" is a binary variable that takes the value of one if the acquirer's audit firm is one of the Big 4, and zero otherwise. Control variables (omitted for brevity) are the same as in Table 1.4 and defined in Appendix 1.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses; ***, ** 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

Table 1.1 – Sample Description

This table shows the acquisitions included in our final sample, which were completed between 1998 and 2017 by US firms publicly traded on the 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 an equity stake in the target of less than 50% before and more than 50% after are considered. The acquisition must be classified as a merger or acquisition by SDC. Our treatment group includes deals involving earnouts, and our control group includes deals without earnouts. Panel A to E are self-explanatory.

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

Table 1.1 – Sample Description (Cont'd)

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%
Earnout length (years)		
>0 and =<1	127	27.5%
>1 and =<2	130	28.2%
>2 and =<3	117	25.4%
>3 and =<4	40	8.7%
>4 and =<5	27	5.9%
>5 and =<6	4	0.9%
>6	16	3.5%
Total	461	100%

Table 1.1 – Sample Description (Cont'd)

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 1.2 – Descriptive statistics

This table provides descriptive statistics for acquirer firms in the year the deal is completed. Dollar values are expressed in US$ million ($MM) reflecting the 1998 Consumer Price Index). "DV (MM)" is the deal value in millions of dollars. "Owned after deal (%)" is the percentage of shares owned after the deal is completed. "EO(%)" is the amount of earnout consideration divided by the total deal value. "Target Public" is an indicator variable that takes the value of one if the target firm is a public firm and zero otherwise. "Cross-border" is an indicator variable that takes the value of one if the target is from a country other than the U.S. and zero otherwise. "MV ($MM)" is the market value in millions of dollars. "Sales ($MM)" is sales in millions of dollars. "Debt ($MM)" is the total debt in millions of dollars. "Total Assets $(MM)" is the total assets in millions of dollars. "Net income ($MM)" is the net income in millions of dollars. "M/B" is the 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 the total debt divided by total assets. "ROA" is the return on assets computed as net income divided by lagged total 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 three-year period average after the deal is completed. All variables are defined in Appendix 1.A. All continuous variables are winsorized at the top and bottom 1% of the distribution.

	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	0.000	4445	0.000	0.000	3928	32.107	26.316	517
Target Public	0.140	0.000	4445	0.156	0.000	3928	0.017	0.000	517
Cross-border	0.203	0.000	4445	0.206	0.000	3928	0.178	0.000	517
MV ($MM)	3317.352	560.821	4424	3485.673	626.244	3909	2039.749	275.532	515

Table 1.2 – Descriptive statistics (cont'd)

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 $(MM)	2716.564	507.045	4436	2899.590	570.135	3920	1326.142	219.637	516
Net income ($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	4.750	2.199	515
DV/TA	0.571	0.116	4405	0.584	0.111	3892	0.472	0.160	513
DV/MV	0.339	0.082	4316	0.346	0.080	3821	0.286	0.104	495
Leverage	0.240	0.215	4429	0.248	0.225	3914	0.178	0.120	515
ROA	-0.064	0.039	4404	-0.064	0.040	3891	-0.066	0.031	513
Disc. Accr.	0.001	0.001	4432	0.001	0.001	3917	-0.005	-0.004	515
Abn. Disc. Exp.	0.014	0.024	4389	0.0168	0.0252	3875	-0.004	0.008	514
Abn. Prod. Costs	0.015	0.014	4400	0.0159	0.0148	3888	0.0065	0.0062	512
TRM	0.0298	0.038	4444	0.0328	0.042	3927	0.0064	0.003	517

Table 1.3 – Univariate Analysis

This table reports univariate comparison of means and medians of earning management measures between treatment and control groups. "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). The table reports means and medians for the first, second, and third years post-deal, and also for the full three-year period post-deal. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively using t-test for differences in means and the Wilcoxon ranksum test for differences in medians.

	Earnout		Non-earnout		Difference			
	Mean	Median	Mean	Median	Mean		Median	
				Period Effective=1				
Disc. Accr.	-0.0065	-0.0068	0.0032	0.0035	-0.0097	**	-0.0103	***
Disc. Exp.	-0.0092	0.0042	0.0170	0.0277	-0.0262	***	-0.0235	***
Abn. Prod. Costs	0.0087	0.0014	0.0172	0.0168	-0.0085		-0.0153	
TRM	0.0011	0.0077	0.0347	0.0446	-0.0336	**	-0.0369	**
				Period Effective=2				
Disc. Accr.	-0.0028	-0.0073	-0.0017	-0.0005	-0.0011		-0.0068	
Disc. Exp.	-0.0067	0.0080	0.0226	0.0312	-0.0293	***	-0.0232	***
Abn. Prod. Costs	0.0080	-0.0019	0.0167	0.0157	-0.0087		-0.0176	
TRM	0.0021	0.0089	0.0394	0.0461	-0.0373	**	-0.0372	**
				Period Effective=3				
Disc. Accr.	-0.0093	-0.0046	-0.0016	-0.0017	-0.0076		-0.0028	
Disc. Exp.	-0.0037	0.0102	0.0214	0.0306	-0.0251	**	-0.0204	**
Abn. Prod. Costs	-0.0030	-0.0006	0.0140	0.0138	-0.0170		-0.0144	**
TRM	-0.0030	0.0136	0.0357	0.0407	-0.0387	**	-0.0272	**
				1<=Period Effective<=3				
Disc. Accr.	-0.006	-0.0062	0.0002	0.0005	-0.0062	**	-0.0067	***
Disc. Exp.	-0.0068	0.0070	0.0202	0.0295	-0.0055	***	-0.0225	***
Abn. Prod. Costs	0.0052	-0.0005	0.0161	0.0156	-0.0270	*	-0.0162	***
TRM	0.0003	0.0100	0.0365	0.0440	-0.0362	***	-0.0340	***

Table 1.4 – The Effect of Earnouts in Earnings Management

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year. "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 one if the deal involves earnouts and zero otherwise. "Short Period" is an indicator variable that takes the value of one if the earnout period is lower than or equal to one and zero otherwise. "Medium Period" is an indicator variable that takes the value of one if the earnout period is higher than 1.5 and lower or equal than five, and zero otherwise. "Long Period" is an indicator variable that takes the value of one if the earnout period is higher than 5 and zero otherwise. "Unknown Period" is an indicator variable that takes the value of one if the earnout period is unknown and zero otherwise. "Relative Size" is the ratio between deal value and lagged total assets. "TA" is the natural logarithm of total assets. "Target Public" is an indicator variable that takes the value of one if the target firm is a public firm and zero otherwise. "Cross-border" is an indicator variable that takes the value of one if the target is from a country other than USA and zero otherwise. "Same Industry" is as binary variable that equals one if both acquirer and target belong to the same industry, and zero otherwise. "Leverage" is the total debt divided by total assets. "ROA" is the return on assets computed as net income divided by lagged total assets. "Ln(Tot. Assets)" is the natural logarithm of total assets. "M/B" is the market-to-book value. "Analyst" is the natural logarithm of 1+number of analysts following the firm (the number of analysts is set to zero if not reported). All variables are defined in Appendix 1.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** 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***

Table 1.4 – The Effect of Earnouts in Earnings Management (cont'd)

	(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/B_{t-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

Table 1.4 – The Effect of Earnouts in Earnings Management (cont'd)

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)
Unknown 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***

Table 1.4 – The Effect of Earnouts in Earnings Management (cont'd)

	(-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 1.5 – Earnout payment and Earnings Management

This table provides the results of Tobit regressions of earnout payment relative to total earnout amount. EM is a binary variable that takes the value of one if the corresponding earnings management measure value is below its median and zero otherwise. Control variables are the same as in Table 1.4 and described in Appendix 1.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** 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
R-squared	0.121	0.127	0.133	0.134

Table 1.6 – Upfront and Total Earnout Payment Method and Earnings Management

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year. Panels A (B) use subsamples of earnout deals in which upfront (total) payment is 100% cash or stock; the counterfactuals are non-earnout deals fully paid in cash or stock, respectively. Control variables are the same as in Table 1.4 and defined in Appendix 1.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% significance levels, respectively.

Panel A – Upfront Payment in Cash *versus* Stock

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

Table 1.6 – Upfront and Total Earnout Payment Method and Earnings Management (Cont'd)

Panel B – Total Payment in Cash *versus* Stock

	(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	0.0007	-0.0031	-0.0228***	0.0085	-0.0079	0.0439	-0.0294*	0.0312
	(0.22)	(-0.15)	(-2.88)	(0.26)	(-0.96)	(1.50)	(-1.96)	(0.55)
Observations	7,342	1,374	7,241	1,372	7,271	1,343	7,374	1,382
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	0.051	0.230	0.182	0.162	0.125	0.127	0.127

Table 1.7 –Earnings Management during and after earnout period

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year. The earnout sample used in Panel A covers only the years when the earnout was active. In Panel B, only the years after the earnout expired were considered. Control variables are the same as in Table 1.4 and defined in Appendix 1.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** 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

Table 1.7 –Earnings Management during and after earnout period (Cont'd)

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
R-squared	0.020	0.118	0.095	0.097

Table 1.8 –Earnouts and Earnings Management: Correcting for Endogeneity

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year, using Heckman (1979) procedure. The first-stage regression (Model (1)) estimates the probability of using earnouts. The dependent variables of the valuation equations are our earnings management measures. "Post-2007" is an indicator variable that takes the value of one if the deal is announced after 2007, and zero otherwise. "Lambda" is the inverse Mill's ratio. Control variables are the same as in Table 1.4 and defined in Appendix 1.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** 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)
Unknown 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 1.9 – Earnouts and Earnings Management: CEM Approach

This table reports coefficient estimates from regressions covering the period from the first to the third year after the completion year. "Earnout" is a binary variable that takes the value of one if the deal includes an earnout and zero otherwise. Control variables are the same as in Table 1.4 and defined in Appendix 1.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** 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 1.10 –Earnings Management and Management Retention

This table reports coefficient estimates from regressions for the period covering the first to the third year after the completion year. "Earnout with Retained Target Mngmnt" is a binary variable that takes the value of one if the target's management in earnout deals stays after deal completion, and zero otherwise. "Earnout without Retained Target Mngmnt" is a binary variable that takes the value of one if the target's management in earnout deals leaves after deal completion, and zero otherwise. Control variables are the same as in Table 1.4 and defined in Appendix 1.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** 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 with Retained Target Mngmnt (1)	-0.0117***	-0.0293***	-0.0138	-0.04047*
	(-2.68)	(-2.97)	(-1.40)	(-2.22)
Earnout without Retained Target Mngmnt (2)	0.0079	-0.0674***	-0.0550***	-0.1229***
	(0.94)	(-3.87)	(-3.78)	(-4.28)
Constant	-0.0104	-0.2143***	-0.1476***	-0.3336***
	(-0.90)	(-7.93)	(-5.00)	(-6.75)
F-statistic from the difference between (1) and (2)	4.48**	3.82*	5.88**	6.21**
Observations	10,651	10,535	10,532	10,702
Control Variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.021	0.119	0.096	0.098

2. COMPENSATION INCENTIVES AND THE USE OF EARNOUTS

2.1. Introduction

Bidders and targets in mergers and acquisitions may have significantly different expectations regarding the synergies created by the deal and the post-deal financial performance. Earnouts are usually regarded as a valuable mechanism to bridge the valuation gap between bidders and targets, and to address information asymmetries between the two parties. An earnout is a contractual provision in which the seller receives additional compensation based on the future performance of the acquired (or combined) entity. This mechanism is designed to align the interests of both parties, offering the target an opportunity to capture potential upside while mitigating the bidder's risk associated with overpayment. The use of earnouts, however, is influenced by several factors, including the characteristics of the bidder's management, particularly the incentives embedded in the CEO's compensation structure.

Stock grants and executive stock options are important components of CEO compensation, and the characteristics of those options – namely their delta and vega – impact different aspects of the CEO's risk-taking behavior. Delta is defined as the dollar change in a CEO's stock and option portfolio for a 1% change in stock price; it measures the sensitivity of the CEO's wealth to changes in the firm's stock price. A higher delta implies that the CEO has substantial wealth tied to the firm's stock performance (Hirshleifer et al., 2012; Sunder et al., 2017; Alexandridis et al., 2021). Conversely, vega is the dollar change in the value of a CEO's option holdings for a 1% change in stock return volatility. A higher vega indicates that the CEO's compensation is more sensitive to changes in risk (Bakke et al., 2016; Mao & Zhang, 2018).

We study the impact of delta and vega on the inclusion of earnout clauses in M&A deals. Compensation structure can significantly influence the likelihood of using earnouts in M&A transactions, but the direction is unclear. CEOs with higher delta, being more sensitive to stock price movements, are more likely to aggressively pursue acquisitions with a more positive expected stock price reaction. Research on earnouts in mergers and acquisitions reveals mixed effects on market reactions. While early studies show a positive or neutral market reaction to deals that include earnouts (Kohers & Ang, 2000; Officer et al., 2009; Barbopoulos & Sudarsanam, 2012), most recent empirical evidence suggests an adverse overall stock price reaction and only positive in specific contexts (Barbopoulos et al., 2017; Barbopoulos & Danbolt, 2021; Alexakis & Barbopoulos, 2019). Several factors may explain this finding. First, earnouts are often used by more financially constrained firms (Bates et al., 2018). Second, they expose acquirers to higher post-deal litigation risk (Viarengo et al., 2018), which is factored into announcement returns. Third, because earnouts help resolve some deal uncertainty, they effectively cap announcement returns, similar

to more conservative investments. In line with this research, one would expect acquiring CEOs with higher delta to be less likely to engage in acquisitions with contingent payments, as they may curb announcement returns.

The rationale for a potential negative relation between acquiring CEO's delta and the use of earnouts can be challenged if one assumes that managers hold poorly diversified portfolios compared to other investors. Arguably, that is the case of CEOs of U.S. acquirers (especially the largest ones), where top managers own a small fraction of the company. Nonetheless, the literature on shareholder-manager interest alignment suggests that because a CEO's wealth is highly concentrated in the firm's equity (higher delta), they are exposed to a greater risk (Coles et al., 2006) and are more likely to make conservative investment decisions (Guay, 1999; Bakke et al., 2016; Mayberry et al., 2021). This results in managers preferring safer projects and forgoing risky ones with positive NPV (Hirshleifer & Thakor, 1992; Holmström, 1999; John et al., 2008).

One way to overcome this risk aversion caused by high delta is to increase vega through option-based compensation. By providing convex payoffs, higher vega can reduce managers' risk aversion (Coles et al., 2006). The extent to which greater compensation convexity (vega) mitigates interest misalignment between managers and shareholders is still debatable. A strand of the theoretical literature suggests that higher vega mitigates agency problems by overcoming risk aversion (Haugen & Senbet, 1981; Smith & Stulz, 1985; Guay, 1999). Others, however, challenge this view, questioning the efficacy of compensation convexity in increasing risk-taking and circumventing managers' preference for lower volatility (Carpenter, 2002; Ross, 2004). Empirical studies also present mixed results. Some provide evidence that greater convexity aligns managers' and shareholders' interests (e.g., Coles et al., 2006; Cohen et al., 2023; Croci & Petmezas, 2015), while others cast doubt on its impact and effectiveness (e.g., Brick et al., 2012; Armstrong & Vashishtha, 2012; Hayes et al., 2012).

We then raise the question of whether acquiring CEOs with higher vega are more or less likely to make acquisitions with earnout payments. Earnouts can be seen as a way to manage the risk-return tradeoff in acquisitions. While higher vega incentivizes CEOs to pursue high-risk, high-return deals, earnouts help limit downside exposure and cap potential gains. CEOs with higher vega may prefer single-payment deals to maximize the impact on stock prices and avoid earnouts. Thus, we expected a negative relationship between the CEO's vega and the use of earnouts in M&As.

We test our hypotheses on a sample of 11,213 controlling M&A deals (1.089 include earnout clauses) announced between 1998 and 2022 by US firms. We find that a higher CEO compensation delta in the year before the deal is announced is strongly associated with managers avoiding earnouts. Given recent

empirical evidence on the market's adverse reaction to earnout deal announcements (Alexakis & Barbopoulos, 2019; Barbopoulos & Danbolt, 2021), this corroborates the idea that CEOs with higher delta favor market reaction over risk protection. Evidence on vega, although in the same direction, is not as strong. We also find an adverse effect of vega on the decision to include earnout agreements in M&A deals. This finding is in line with the idea that, because earnouts reduce the risk involved in the deal, managers with high vega find those deals less attractive and prefer greater exposure over using contingent payments. When delta and vega are included in the regressions, the delta effect dominates, and the coefficient on vega, while still negative, is no longer statistically significant.

Additionally, knowing that the use of earnouts is particularly relevant for deals facing greater valuation disagreements, we identify deals where it is more challenging to value targets and acquisition synergies. Private targets and targets with more intangible assets are more challenging to value due to a lack of transparency and the nature of their assets. For example, Fuller et al. (2002) show that acquirers yield higher returns when targeting private firms precisely because they require a discount for this lack of transparency. Masulis et al. (2023) find that acquisitions of intangible-rich targets also yield higher returns to the acquiring shareholders. Managers with higher delta and vega will be more prone to undertake the risk involved in these deals with the prospect of higher returns. To test this hypothesis, we separate the sample into two groups – one consisting of private targets or targets operating in industries characterized by having more intangible assets (i.e., deals with greater valuation uncertainty) and the other including all other deals – and test our main models. The findings suggest that the negative relationship between delta and the likelihood of using earnouts is concentrated in the subsample of intangible private targets. Interestingly, in the sample of regular targets, where the potential upside return from not using earnouts is lower, there is no significant relationship between delta and the use of earnouts. The coefficients on vega are negative but insignificant in the subsample of "other" targets. This suggests that CEOs with higher vega prefer to avoid earnouts and expose themselves to greater volatility.

We make several contributions to the literature. First, we add to the growing research on the determinants of earnout usage in M&As (e.g., Cain et al., 2011; Barbopoulos & Sudarsanam, 2012; Bates et al., 2018) by showing that risk-taking incentives provided to CEOs through compensation packages influence their choice of earnout agreements. To the best of our knowledge, we are the first to study how CEO compensation incentives (captured by the delta and vega of their holdings in the company's stock and options) affect their decision to use or avoid contingent payments in M&A deals. Second, we contribute to the broader mergers and acquisitions literature by uncovering a mechanism, based on compensation incentives, that influences managerial decisions in acquisitions (e.g., Datta et al.,

2002; Grinstein & Hribar, 2004; Coles et al., 2006; Harford et al., 2012). Finally, we contribute to the debate on the efficacy of compensation schemes in management's decision-making, particularly equity- and option-based compensation (Jensen & Murphy, 1990; Coles et al., 2006; Edmans & Gabaix, 2016). Our results suggest that (i) CEOs with higher delta tend to avoid earnouts when the perceived negative impact on returns is greater, and (ii) CEOs with higher vega refrain from using earnouts in deals where their use is not expected, thereby not excessively avoiding risk. The remainder of the work is organized as follows: in section 2.2, we review the existing literature and develop the hypotheses; in section 2.3, we describe the data and methodology; in section 2.4, we present and discuss the results; and in section 2.5, we conclude.

2.2. Background And Literature Review

2.2.1. Earnouts

Earnouts have become a common contractual feature in mergers and acquisitions, typically structured as two-part payments involving an upfront cash portion and deferred contingent payments tied to the post-acquisition performance of the target (Kohers & Ang, 2000; Datar et al., 2001). Their primary function is to mitigate information asymmetries between the acquirer and the target by shifting part of the valuation risk to the selling shareholders. By doing so, earnouts provide a contractual hedge against overpayment when the target's future performance is uncertain, particularly in deals involving privately held or intangible-rich firms where due diligence cannot fully reveal actual value (Cain et al., 2011; Barbopoulos & Danbolt, 2021).

Beyond their role in resolving information asymmetry, earnouts fundamentally operate as risk-sharing devices. By deferring a portion of payment contingent on realized outcomes, earnouts protect the acquirer from downside risk if the target underperforms relative to initial projections. This protection is especially valuable when the target's performance is highly uncertain or subject to managerial commitment (Datar et al., 2001).

However, these benefits come with important trade-offs. Because the contingent payment mechanism also obligates the acquirer to pay a premium if the target meets or exceeds the negotiated benchmarks, earnouts effectively limit the acquirer's upside returns. In other words, the acquirer shares the benefits of superior post-deal performance with the seller, potentially reducing the value captured from highly successful acquisitions. Moreover, monitoring and verifying performance measures may increase litigation risk and create opportunities for accounting manipulation (Barbopoulos & Danbolt, 2021;

Barbopoulos & Sudarsanam, 2012). These contractual features imply that earnouts constrain both the downside losses and the upside gains, functioning as a risk-hedging but return-limiting tool.

The existing literature further suggests that earnout announcements are met with mixed market reactions. While earnouts theoretically reassure investors by aligning the interests of the buyer and seller (Datar et al., 2001), they may also be interpreted by the market as a negative signal of valuation uncertainty or a weak negotiation stance (Barbopoulos & Sudarsanam, 2012). Barbopoulos and Danbolt (2021) find that cumulative abnormal returns at earnout deal announcements are, on average, negative, supporting the view that investors penalize these transactions' perceived complexity and uncertainty.

Thus, CEOs with higher delta — who are especially sensitive to negative CARs due to their compensation incentives — are likely to avoid earnout structures to protect their wealth tied to share price movements. Conversely, higher vega managers might forgo earnouts to maximize exposure to high-return, high-risk opportunities. This creates a tension between the contractual role of earnouts in hedging valuation risk and the incentive-driven managerial objective of maximizing personal compensation tied to risk and performance.

2.2.2. Compensation Incentives

Uncertainty surrounding M&As stems from various factors such as the valuation of target assets, the integration of different cultures and business models, and the impact of market and economic conditions, among others. Earnouts have been pointed out as a way to overcome such challenges. Not surprisingly, previous research shows that earnouts are mainly used when the deal poses additional risk whether because the target firm belongs to an industry with higher volatility (high-tech industries) or because it is more opaque (private targets), and so harder to value (Cain et al., 2011; Kohers & Ang, 2000; Ragozzino & Reuer, 2009). Additionally, earnouts can bridge the valuation gap between buyer and seller when there is disagreement about the prospects of the target and, consequently, its price. In this sense, earnouts can be seen as an "insurance policy" for the acquirer, as they protect against overpayment and moral hazard problems, serving as an additional tool for managers to undertake positive-NPV projects that could otherwise be abandoned.

How compensation packages are designed helps managers deal with uncertainty (Albuquerque et al., 2024). The effect of compensation package design on firm performance and management decisions has been subject to significant research, but the evidence is mixed. In the M&A context, Gormley et al. (2013) examine how managerial compensation incentives influence managers' risk-taking behavior. The authors find that less convex compensation leads to greater risk-reducing activities such as diversifying

acquisitions. Using CEO relative inside leverage as a proxy of risk-incentive measure, Lin et al. (2018) reach similar conclusions, showing that CEOs with higher inside leverage are more likely to engage in vertical mergers. Boulton et al. (2014) study whether compensation structure influences the propensity to make acquisitions. The authors report a positive relation between equity-based compensation and CEO acquisitiveness and the use of equity as the payment method. Hagendorff and Vallascas (2011) analyze how the structure of executive compensation affects the risk decisions bank CEOs make. They show that CEOs with higher pay-risk sensitivity (measured by vega) engage in risk-increasing mergers. Croci and Petmezas (2015) find that risk-taking incentives, as measured by vega, induce CEOs to engage in M&A deals. Hillier et al. (2020) study the relationship between executive compensation and the propensity to engage in M&A transactions. The authors conclude that CEO wealth sensitivity to firm risk (vega) is (positively) related to the propensity to acquire only in out-of-wave years. At the same time, no significant relationship is found for delta.

In a different setting, Chava and Purnanandam (2010) show that the management team's risk-taking incentives (proxied by delta and vega) influence financial policies. Specifically, the authors present evidence that CEOs' incentives affect leverage and cash holdings while CFOs' incentives influence debt maturity structure and accrual decisions. Eisdorfer et al. (2013) investigate whether deviations between the executive compensation leverage ratio and the firm's debt-to-equity ratio impact investment decisions. They find that the higher the difference, the more pronounced the investment distortions, translating into conservative investment policy when the compensation package's debt component is relatively higher than firm leverage, and overinvestment when compensation is more equity-based. Shen and Zhang (2020) reach the same conclusions, supporting the idea that CEO inside debt constrains excessive risk-taking, lowering the cost of equity. Bakke et al. (2016) relate the convexity of managerial compensation to managerial risk-taking practices. They show that a reduction in vega was accompanied by a significant decline in managerial risk-taking through increased corporate hedging. Devos et al. (2018) find that CEOs with compensation structures more sensitive to firm stock price changes (higher delta) are more likely to engage in stock splits. Specifically, the chosen split factor is negatively related to the CEO's delta (sensitivity to stock price) but positively related to the CEO's vega (sensitivity to stock volatility)

Several studies also find evidence that compensation structure influences the propensity to engage in earnings management activities. Bergstresser and Philippon (2006) find evidence that CEOs whose overall compensation is more sensitive to share prices engage in higher levels of earnings management. This, in turn, translates into unusual levels of option exercises and unusual quantities of shares sold in years of high levels of accruals. Cohen and Zarowin (2010) find that firms with significant option-based

compensation tend to manage earnings to meet or exceed earnings targets. Harris et al. (2019) reach a similar conclusion and further show that, at higher levels of equity incentives, gender does not play a mitigating role in earnings management. Kang et al. (2006) analyze the relationship between corporate investment spending and the compensation structure, concluding that long-term investment positively correlates with the proportion of equity-based incentive compensation.

In the banking sector, Uhde (2016) provides evidence that excessive variable compensation is associated with risk-increasing decisions by managers. Contrarily, Vallascas and Hagendorff (2013) show that banks whose CEOs receive larger bonuses tend to exhibit lower levels of default risk. However, factors such as bank riskiness and regulatory environment have a moderating effect. Guo et al. (2015) also provide empirical evidence that an increase in the proportion of incentive-based pay decreases the likelihood of banks becoming problematic. Similarly, Chen et al. (2006) investigate the relation between stock option compensation and risk-taking, concluding that the banking industry's increase in equity-based compensation after deregulation in the 1990s led to greater risk-taking. In the context of the 2007-2010 financial crisis, for a sample of large US financial firms, Boyallian and Ruiz-Verdú (2018) show that a higher pre-crisis CEO delta is associated with a significantly higher probability of failure during the crisis period for highly levered firms but not for firms with relatively low leverage. This comes from shareholders' strong incentives to shift risk onto debtholders in levered firms.

2.3. Sample, Data and Methodology

2.3.1. Sample and Data

Using Thomson Financial's Securities Data Corporation (SDC) database, we create a sample of M&A deals announced between 1998 and 2022. Stock market and firm-level accounting data are from LSEG (Refinitiv) Datastream/Worldscope. The CEO's portfolio delta and vega are from Professor Lalitha Naveen's website and follow Coles et al. (2006), based on Core and Guay (2002) methodology[22].

We impose the following conditions for a deal to be included in our final sample. First, the bidder is a U.S. publicly traded firm. Second, SDC does not classify the bidder as an "Investor Group" or "Shareholders"; the target is neither a Joint Venture nor a "Government" firm. Third, the deal is classified in SDC as an acquisition or a merger. Fourth, the bidder is not in the financial or regulated sectors. Fifth, the book value of equity must be non-negative. Sixth, only deals above $1M are considered. Finally, the bidder must own less than 50% of the target before the deal and seek majority control.

[22] We thank Professor Lalitha Naveen for sharing data on executives' portfolio vega and delta on her website: https://sites.temple.edu/lnaveen/data/.

Our final sample comprises 11,213 deals, of which 1,089 include earnouts[23].

Table 2.1, Panel A, presents the distribution of deals by announcement year. The use of earnouts has been increasing over the years, especially after the financial crisis of 2007-2010. At the industry level[24] (panel B), as highlighted in previous literature (Cain et al., 2011; Kohers & Ang, 2000; Ragozzino & Reuer, 2009) it is also clear that earnouts are widely used when targets operate in R&D-intensive industries (Pharmaceutical Products), High-Tech industries (Medical and Electronic Equipment, Apparel), industries with mainly intangible assets (Business Services).

[Insert Table 2.1 here]

Table 2.2 presents deal and firm characteristics. On average, earnouts are used by smaller bidders in smaller deals. Additionally, in deals with earnouts, the relative size of the target firm (measured by the deal's value) to the bidder is lower than in non-earnout deals. Interestingly, contrary to the evidence presented by Ewelt-Knauer et al. (2018) for an international sample, in our sample, the average number of cross-border deals is lower in the earnout subsample (20,2%) than in the non-earnout sample (24,5%). This may be due to the monitoring challenges that cross-border deals present in enforcing the performance metrics that trigger the earnout payment. Earnouts are also more frequently used in acquisitions across industries.

In line with Bates et al. (2018), firms that use earnouts are, on average, less likely to pay dividends. The authors interpret this finding as evidence of earnouts being a way of financing acquisitions and overcoming bidders' financial constraints. Previous literature shows that earnouts are rarely used in acquisitions of public targets. This supports the argument that earnout contracts help mitigate information asymmetry problems, which are more severe when targets are private or subsidiary firms. Earnouts are also more frequently used by younger bidders, probably to compensate for the lack of experience in managing complex investment projects. Additionally, bidders using earnouts are less levered, possibly reflecting the fact that they are also smaller firms operating in industries characterized by higher uncertainty.

Both delta and vega are lower in firms that use earnouts than in those that pay the full amount upfront. For non-earnout bidders, the average (median) increase in CEO wealth associated with a 1% increase in stock price is $1,144,232 ($274,890), whereas for earnout users, the corresponding values are $705,333 ($157,314). Similarly, the average (median) increase in CEO wealth due to a 1% increase in

[23] The size of the sample for each regression may vary according to data availability.

[24] For sake of space and readability we only present values for the most significant target's industries.

stock return volatility is $154,397 ($47,785) for non-earnout bidders, and $123,480 ($30,930) for earnout bidders.

[Insert Table 2.2 here]

2.3.2. Methodology

Following our arguments above, we argue that high-delta and vega CEOs prefer to avoid using earnouts in favor of methods of payment better received by the market. To test this conjecture, we model the binary variable earnout using linear probability models (LPM). LPM has the advantage of ease of coefficient interpretation and no need for parameter transformation into marginal effects. Additionally, it allows for the preservation of observations due to the avoidance of collinearity issues[25]. Specifically, to examine the influence of CEO compensation on the decision to use earnouts, we estimate the following model:

$$\mathrm{P}(\mathrm{Earnout}_{\mathrm{i}}=1)_{\mathrm{i,t}}=\alpha+\beta_1\mathrm{X}_{\mathrm{i,t-1}}+\beta_{\mathrm{n}}Z_n+\ \mu_{\mathrm{t}}+\lambda_{\mathrm{j}}+\varepsilon_{\mathrm{it}} \qquad (1)$$

The dependent variable is a binary variable that takes the value of 1 if the acquisition made by firm i in year t includes earnout, and zero if it does not.; *X* is compensation measure (delta and vega[26]) which is our variable of interest; Z_n is a vector of control variables, including *Cross-border* (an binary variable that equals one if the target is from a country other than USA, and zero otherwise); *Same Industry* (an binary variable that equals one if both bidder and target are in the same Fama-French 48 Industry classification, and zero otherwise); *Leverage* (the total debt divided by total assets); *Bidder Age* (the natural logarithm of 1plus the difference between year of announcement and year the firm was founded); *Dividend Payer* (a binary variable that take the value of 1 if the firm distributed dividends and zero otherwise); *MTB* (the ratio between the market value of equity and the book value of equity); *Public Target* (an binary variable that equals one if the target is publicly traded at the time of the deal, and zero otherwise); *Relative Size* (the ratio between the deal value and the market capitalization of the bidder); *Analysts Following* (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}).

As prior research emphasizes, earnouts are particularly useful in transactions involving targets more difficult to value, with a high proportion of intangible assets and/or that operate in industries characterized

[25] We are aware of the risk of inconsistent and biased coefficients in LPM when values lie outside [0,1] interval (Horrace & Oaxaca, 2006) Still, in the Internet Appendix, we report very similar coefficients of marginal effects for our regressions if we use a probit model instead.

[26] In all regression delta and vega are in millions.

by high uncertainty (Datar et al., 2001; Cain et al., 2011). At the same time, since such deals also yield higher returns, managers with higher delta and vega will be more susceptible to undertaking them. With this in mind, we hypothesize that if CEO compensation structure influences the decision to use earnouts, the effect is stronger in acquiring firms that operate in such industries. We test this in two ways: first, we re-run equation (1), adding an additional control variable, *Intang. Priv. Target*, a binary variable that takes the value of one if the target firm belongs to an intangible-rich industry as defined by Barbopoulos and Adra (2016) (Entertainment, Healthcare, Medical Equipment, or Pharmaceutical Products), if it is a private firm or if SDC characterizes it as belonging to a high-tech sector. Secondly, we split our sample into two groups based on the control variable *Intang. Priv. Target,* and run equation (1) separately for each group.

While earnouts are widely recognized as effective contractual mechanisms for mitigating valuation uncertainty, they also impose important constraints on the distribution of deal outcomes. By tying part of the acquisition price to future performance, earnouts limit the acquirer's exposure to downside risk – but they simultaneously cap the potential upside gains, since any overperformance triggers additional payments to the seller. From a risk–return perspective, earnouts serve as a hedging device: they reduce volatility but also constrain expected value. This dual effect is particularly salient when viewed through the lens of managerial incentives.

Executives whose compensation includes high delta, indicating sensitivity to share price movements, may avoid earnouts not just because of anticipated market reactions, but because these structures restrict the possibility of significant positive returns that could enhance firm value and, by extension, personal wealth. Similarly, CEOs with high vega, rewarded for increased return volatility, may perceive earnouts as unattractive precisely because they dampen the deal's risk exposure and curtail high-variance outcomes. In this context, the choice to use an earnout reflects a trade-off between securing more predictable deal outcomes and preserving exposure to strategic upside. We incorporate cumulative abnormal returns (CARs) into our analysis to test how this trade-off manifests in practice. Market reactions to deal announcements serve as a forward-looking measure of perceived value creation (or destruction) from the transaction. By examining the association between earnout use, CEO incentives, and CARs, we can assess whether the market penalizes or rewards these contractual choices and whether managers anticipate such reactions and adjust their behavior accordingly.

We calculate each bidder's CAR using an adjusted market model approach to measure the market's response to deal announcements. Following extant literature (Kau et al., 2008; Faccio et al., 2006; Fuller et al., 2002; Barbopoulos & Danbolt, 2021), we estimate the announcement period return as the

difference between the firm's daily stock return and the DataStream value-weighted market index, as given by:

$$\mathrm{AR_{it}} = \mathrm{R_{it}} - \mathrm{R_{mt}} \quad (2)$$

We then compute the cumulative abnormal return (CAR) over a three-day event window, from one day before to one day after the announcement date (i.e., t = -1 to t = +1):

$$\mathrm{CAR_i} = \sum_{t-1}^{t+1} \mathrm{AR_{it}} \quad (3)$$

Finally, we use the following model:

$$\text{Bidder CAR}\,[-1;1] = \alpha + \beta_1 \mathrm{Earnout_{i,t}} + \beta_2 \mathrm{X_{i,t-1}} + \beta_n \mathrm{Z_n} + \mu_t + \lambda_j + \varepsilon_{it} \quad (4)$$

Where, as before, *Earnout* is a binary variable that takes the value of one if the deal includes earnout at announcement and zero otherwise, *X* is the compensation measure (delta and vega) and Z_n is a vector of control variables known to help explaining CARs, including *Public Target* (an binary variable that equals one if the target is publicly traded at the time of the deal, and zero otherwise); *Cross-border* (an binary variable that equals one if the target is from a country other than USA, and zero otherwise); *Same Industry* (an binary variable that equals one if both bidder and target are in the same Fama-French 48 Industry classification, and zero otherwise); *Bidder Size* (the natural logarithm of one plus bidder's market capitalization); *MTB* (the ratio between the market value of equity and the book value of equity), *ROE* (the return on equity given by the ratio between net income and book value of equity); *Bidder age* (the natural logarithm of one plus the difference between the announcement date and the date the firm was founded); *Deal Value* (the natural logarithm of one plus the deal value); *Leverage* (the total debt divided by total assets). Also, as before, all regressions include binary variables to control for year (μ_t) and industry (λ_j).

2.4. Empirical Results

2.4.1. CEO Compensation and the Use of Earnouts

We begin our empirical analysis by examining how CEO compensation incentives shape the likelihood of using earnouts in M&A transactions. Specifically, we estimate Equation (1) using a linear probability model where the dependent variable equals one if the deal includes an earnout. Our key explanatory

variables are delta and vega, which proxy for the CEO's sensitivity to changes in the level and volatility of the firm's stock price, respectively.

Table 2.3 presents the results across three model specifications. In Model (1), delta and vega are included jointly; in Models (2) and (3), they are included separately to disentangle their effects. Across all specifications, CEO delta consistently exhibits a negative and statistically significant relationship with the likelihood of earnout adoption, with coefficients ranging from –0.0026 to –0.0034. These findings indicate that CEOs with wealth more exposed to short-term stock price movements are systematically less likely to employ earnout contracts. This aligns with our theoretical expectations that CEOs respond to the risk–return trade-offs embedded in different deal structures.

While helpful in addressing information asymmetries and reducing upfront costs, earnouts can limit the acquirer's upside by requiring the acquirer to share the gains with the sellers. This constrains the ability of the acquiring firm to fully realize and capitalize on value creation at the time of the transaction. For CEOs with high delta, whose wealth is tightly linked to the firm's stock price, this limitation on short-term value capture may act as a deterrent. These CEOs have strong incentives to favor structures that allow the full realization of value at announcement or shortly thereafter, maximizing the potential return from favorable market reactions and avoiding mechanisms that defer or dilute perceived gains. The consistent negative and significant relationship between delta and earnout use suggests that such CEOs are less willing to engage in deal structures that constrain immediate returns in exchange for future contingencies.

The evidence for vega is weaker and less robust. While higher vega suggests a greater willingness to engage in risky or volatile strategies, its effect on using earnouts is statistically significant only when we do not control for delta. Once both incentives are considered jointly, the dominant effect appears to come from delta. This reinforces the idea that the opportunity to capture gains upfront, rather than general tolerance for risk, is the key driver in the choice to avoid earnouts. In other words, compensation structure tilts CEOs toward maximizing immediate value creation, and earnouts may be viewed as mechanisms that blunt or defer that upside.

[Insert Table 2.3 here]

These findings support the hypothesis that CEO equity incentives, particularly delta, play a critical role in shaping deal design choices in M&A, specifically regarding contingent payment mechanisms such as earnouts. CEOs who are more sensitive to shareholder value, as reflected in stock price exposure, appear to strategically avoid payment structures that investors will likely penalize at deal announcement.

2.4.2. Uncertainty in target valuation

As unanimously reported in the literature, earnouts are especially useful when targets are more difficult to value, such as when they are private firms or belong to industries with significant intangible assets (Datar et al., 2001; Cain et al., 2011; Barbopoulos & Adra, 2016). With this in mind, we create an additional control variable ("Intang. Priv. Target") to capture such characteristics that make earnout use more likely. If the CEO's decision to include earnouts is related to compensation's delta and vega, we expect to find a stronger relationship in deals surrounded by uncertainty, where earnouts are more likely to be used because those are the ones that may deliver higher returns. Table 2.4 reports our results. Columns (1)–(3) present results for the full sample. In all specifications, including the binary indicator for high-uncertainty targets, defined as private firms or firms in intangible-rich/hi-tech industries, produces a consistently positive and highly statistically significant coefficient (approx. 0.041). This confirms that earnouts are more likely to be used when targets are more challenging to value, consistent with their role in mitigating valuation risk and reducing information asymmetry.

Turning to the CEO incentives, we find a robust negative association between delta and the likelihood of using earnouts. In models (1) and (2), where Delta is included either alone or jointly with Vega, the estimated coefficients (–0.0034 and –0.0027, respectively) are statistically significant at the 1% level. This implies that as delta increases, the probability of using an earnout decreases by approximately 0.27 to 0.34 percentage points. Model (3) further confirms the robustness of this effect even when vega is introduced alone.

To unpack this relationship further, we split the sample based on whether the target firm operates in a high-uncertainty industry (Columns 4–6) or a low-uncertainty industry (Columns 7–9). The results are striking. In the high-uncertainty subsample, delta remains significantly and negatively associated with earnout use (–0.0024 to –0.0031), reinforcing the idea that CEOs exposed to stock price changes avoid earnouts precisely in settings where earnouts are more commonly used. This suggests that the potential constraints on value capture imposed by earnouts for CEOs with high delta outweigh the benefits of reducing valuation risk. These managers may prefer alternative mechanisms that allow immediate value realization, particularly when anticipating a positive market response to the acquisition.

In contrast, within the low-uncertainty subsample, delta becomes statistically insignificant, indicating that in settings where valuation is relatively straightforward and the role of earnouts is less critical, compensation-linked incentives do not meaningfully influence the choice of earnout structures.

The results regarding vega present a more nuanced perspective. In the full sample, the coefficient for vega is negative and statistically significant in model (3) at –0.0303; however, this finding is not robust

across different specifications. Within the high-uncertainty sample, vega shows a negative and significant correlation with earnout usage at –0.0282. This indicates that even CEOs with heightened risk-taking incentives may hesitate to utilize structures that cap their payoff potential when confronted with targets of uncertain valuation. Conversely, in the low-uncertainty group, vega remains insignificant, aligning with the results observed for Delta.

[Insert Table 2.4 here]

Overall, these results provide additional support for the central argument that CEO compensation incentives, particularly delta, play an important role in shaping the decision to adopt contingent payments in M&A. These incentives appear to matter most precisely in transactions where earnouts are theoretically more appropriate, reinforcing the view that managerial incentives interact with deal and target characteristics to determine M&A contract design jointly.

2.4.3. CEO Compensation, earnouts, and stock price reaction

To empirically assess how earnouts and CEO compensation incentives interact with market perceptions of deal value, we estimate the cumulative abnormal returns (CARs) surrounding the deal announcement as a function of earnout use and CEO incentive structures. Table 2.5 presents the regression results of equation (4). We find that the earnout binary variable is negatively and significantly associated with CARs, confirming recent evidence (Barbopoulos et al., 2017; Barbopoulos & Danbolt, 2021; Alexakis & Barbopoulos, 2019) that markets generally respond unfavorably to earnout-based deals. Specifically, earnout deals are associated with approximately 44 basis points (bps) lower abnormal returns across all model specifications. Given that the average acquirer deal value in our sample is approximately $880 million, this corresponds to an average shareholder value loss of about $3.87million within the three-day window. While this effect might seem modest in absolute terms, it is economically meaningful considering the short event window and the size of typical bidder firms. Indeed, even small percentage movements over such a narrow timeframe can signal strong shifts in market reaction.

[Insert Table 2.5 here]

Turning to CEO incentives, the results show that delta and vega are positively associated with announcement returns, although with some variation depending on the specification. In Model (1), delta shows a positive and statistically significant coefficient of 0.0006. This suggests that a one-million-dollar increase in delta is associated with a 6 basis point increase in the bidder's CAR. Given that the mean

delta in the sample is $1.10 million (Table 2.2), this implies that average firms led by more stock-price-sensitive CEOs enjoy a return premium of approximately 6 to 7 bps relative to those with weaker alignment. When both delta and vega are introduced jointly in Model (3), the coefficient on delta falls slightly to 0.0004 and becomes marginally significant at the 10% level. This attenuation suggests some interaction between the two incentive dimensions, which may capture overlapping or competing effects.

Vega also shows a positive and significant relationship with CARs. In Model (2), where it is included independently, the coefficient is 0.0056, implying that each additional $1 million in vega is associated with a 56 basis point increase in CARs. In the full specification (Model 3), the coefficient remains positive at 0.0041 and is significant at the 10% level. While smaller in absolute terms, this effect is notable within a three-day window and suggests that the market views risk-taking incentives to CEOs more favorably at the time of deal announcement.

Control variables behave largely in line with prior literature. Acquisitions of public targets, cross-border transactions, and deals initiated by larger bidders are associated with significantly lower CARs, consistent with concerns about overpayment, integration risks, and empire-building behavior. In contrast, firms with higher return on equity and deals of greater value tend to be associated with higher CARs, suggesting that profitability and scale can enhance market perceptions of deal quality.

Overall, the evidence supports the notion that investors consider both the contractual design of the deal and the nature of managerial incentives when evaluating the quality of M&A transactions. CEOs with more substantial equity-based incentives are less likely to rely on mechanisms viewed skeptically by the market and are rewarded when they do.

2.5. Robustness Tests

2.5.1. Addressing selection bias

While we estimate the probability of using an earnout as a function of lagged CEO incentives (delta and vega), firm characteristics, and deal features, which help avoid simultaneity (reverse causality), there could still be unobserved factors that systematically affect the type of deals that adopt an earnout. That is, maybe earnouts happen in deals with very different characteristics, and CEO incentives correlate with that. Table 2.2 supports this idea of great heterogeneity among firms and deals' characteristics with and without earnouts. To address such an issue, we employ the coarsened exact matching (CEM) technique proposed by Blackwell et al. (2009) to create a matched sample of deals that do not use earnouts. CEM divides the sample firms into bins based on each chosen covariate and then matches on the strata. We

match based on relative size (the ratio between deal value and bidder's total assets), bidder size (given by market capitalization), bidder market-to-book (ratio between market value and book value of assets), target public status, whether the target is from a foreign country, bidder industry and announcement year. We then re-estimate equation (1) using our matched sample.

[Insert Table 2.6 here]

Table 2.6 presents the results of addressing potential selection bias in adopting earnouts. After balancing on observable firm and deal characteristics, the negative association between CEO delta and the probability of using earnouts remains significant and similar in magnitude to the main results, confirming the robustness of our findings. Vega's coefficient also turns negative but insignificant when controlling for delta, suggesting that managers with more substantial risk-taking incentives are less likely to adopt contingent structures once observable deal characteristics are accounted for. These results reinforce the interpretation that managerial pay sensitivities shape preferences toward earnout use, consistent with market reaction concerns and strategic risk-shifting incentives.

2.5.2. Principal Component Analysis (PCA)

Delta and vega are theoretically and empirically correlated[27] measures of CEO option-based incentives. Including both in the same regression introduces multicollinearity, which may inflate standard errors (model (1) in Table 2.3). While delta and vega exhibit negative and statistically significant coefficients when entered separately, only delta remains significant when both are included simultaneously, consistent with concerns about multicollinearity. To address potential multicollinearity between CEO delta and vega, we perform a principal component analysis (PCA) and use the first principal component (PC1) as a robustness check. PCA mitigates this issue by constructing orthogonal components that capture common and unique variation across the two variables. The first principal component (PC1) explains 71.3% of the total variance and loads equally on Delta and Vega (0.7071), capturing the general strength of CEO equity-based incentives. It is used as a summary measure of CEO option-based incentives. When we replace delta and vega with PC1 in our linear probability model, we find that the PC1 coefficient is -0.0068, statistically significant at the 1% level. This result reinforces our main finding: CEOs with more substantial option-based incentives – those more sensitive to stock price and risk – are less likely to use earnouts in deal structuring. This analysis supports the robustness of our results by showing that the

[27] In our sample, delta and vega are highly correlated with a coefficient of roughly 43%.

inverse relationship between CEO incentives and earnout use persists even when accounting for the high correlation between delta and vega in a more parsimonious and statistically stable way.

[Insert Table 2.7 here]

2.5.3. Alternative event windows on CARs

To test the robustness of our findings on market reactions to M&A announcements involving earnouts and CEO incentives, we re-estimate our baseline regressions using alternative event windows: CARs calculated over the [–3;+3] and [0;+1] windows (Table 2.8). These variations capture a wider window potentially reflecting information leakage or delayed reactions, and a narrower window isolating immediate investor response. Across all specifications, the earnout coefficient remains negative and statistically significant at the 5% level, confirming that the market consistently discounts deals with contingent payment structures. Specifically, earnout deals are associated with an average abnormal return that is approximately –56 basis points over the [–3;+3] window (Columns 1 and 2) and –47 basis points over the [0;+1] window (Columns 3 and 4).

These results are remarkably consistent with the baseline [–1;+1] findings reported in Table 2.5 and provide further support for the hypothesis that the use of earnouts is viewed negatively by investors, regardless of the precise timing of the return measurement. Importantly, this reinforces the interpretation that the market perceives earnouts as limiting immediate upside potential or introducing contractual complexity, dampening perceived deal value.

The coefficients on CEO Delta also remain positive and statistically significant across both alternative windows, albeit with slightly reduced magnitude and statistical precision. In Column (1), the coefficient on Delta is 0.0008, indicating that a one-million-dollar increase in delta corresponds to an 8 basis point increase in abnormal returns over a seven-day window. In Column (3), using the [0;+1] window, the delta coefficient remains positive at 0.0004, mirroring results from the [–1;+1] window. This consistency suggests that the market rewards CEOs with stronger alignment to shareholder value immediately and across a slightly longer horizon.

While the coefficients on Vega remain positive across the robustness specifications (0.0047 in Column 2 and 0.0034 in Column 4), they are not statistically significant at conventional levels. This suggests that the market places relatively more emphasis on alignment (delta) than on risk-taking incentives (vega) when assessing the value implications of M&A announcements.

[Insert Table 2.8 here]

Overall, the robustness tests lend strong credibility to the baseline results. The adverse effect of earnouts on announcement returns and the positive role of CEO alignment incentives persist across event window definitions, supporting the view that both contract structure and managerial incentives shape how investors interpret M&A transactions. The stability of the estimates across time windows also helps mitigate concerns that the baseline results are driven by narrow timing assumptions or market microstructure noise.

2.6. Conclusions

Earnouts are a valuable mechanism for solving valuation disagreements between bidders and targets and overcoming information asymmetries. In this sense, earnouts are a tool for managing the risk associated with M&A deals. As a management decision, the use of earnouts is driven by managers' incentives to cope with risk. The structure of CEO compensation plays a key role in influencing risk-taking behavior and may, therefore, affect the choice to use earnouts as a method of payment in M&As.

In this study, we are the first to investigate whether delta and vega influence the decision to include earnouts in M&A deals. So far, the literature on using earnouts has mainly focused on the characteristics of the target firm and the deal. Our analysis is based on a sample of 11,213 controlling M&A deals (1,089 including earnout clauses) announced between 1998 and 2022 by U.S. firms.

We show that a higher CEO compensation delta in the year preceding the deal announcement is associated with a lower probability of including earnouts. Our evidence supports the idea that CEOs with higher delta favor market reaction over risk protection, consistent with prior research showing that the market tends to react negatively to the announcement of earnout deals. Additionally, we also find a negative effect of vega on the decision to use earnouts, suggesting that the risk-taking incentives associated with higher vega discourage the use of earnouts since they reduce risk exposure. Taken together, the effect of delta appears to be more pronounced.

We also show that the negative impact of delta on the likelihood of using earnouts is restricted to the subsample of deals that comprise targets harder to value (i.e., private and intangible-rich targets). Also, managers with higher vega tend to avoid earnouts in deals with less uncertainty as using earnouts in such deals would overly reduce volatility exposure.

We further examine how the market perceives the risk–return dynamics embedded in deal structuring. Consistent with prior research, we find that including earnouts is associated with significantly negative

cumulative abnormal returns (CARs), suggesting that investors interpret these contracts as signals of valuation uncertainty or constrained upside potential. Importantly, CEOs with higher delta are associated with significantly more positive CARs. This indicates that the market tends to place greater confidence in managers whose compensation is closely tied to stock price performance. This suggests that high-delta and high-vega CEOs may avoid earnouts not because they reject risk-sharing *per se*, but because they recognize that earnouts impose a ceiling on potential returns. This outcome could undermine perceived deal quality and trigger negative investor responses. In this light, compensation-incentivized CEOs appear to select deal structures that preserve upside while remaining attentive to how risk-limiting mechanisms, like earnouts, are priced by the market.

From a policy implication perspective, our findings highlight the critical role of CEO compensation in shaping acquisition decisions, particularly through the use of earnouts. By understanding how compensation structures influence earnout adoption, firms can optimize deal structuring to balance risk, maximize value, and ensure alignment between executive incentives and shareholder interests.

Appendix 2.A: Definitions and Sources of the Variables

VARIABLE	DEFINITION	SOURCE
Analysts following $_{t-1}$	Number of analysts following the firm – set to zero if not reported	Refinitiv Eikon
Bidder age	Difference between the year of announcement and the year the firm was founded	Refinitiv Eikon
Bidder size	Bidder's market capitalization	Refinitiv Eikon
CARs	Cumulative abnormal returns	Refinitiv Eikon
Cross-border	Binary variable that equals one if the target is from a country other than the USA, and zero otherwise	SDC/Refinitiv
Deal value	Natural logarithm of one plus the value of the deal	SDC/Refinitiv
Delta	Dollar change in wealth associated with a 1% change in the Dollar change in wealth associated with a 1% change in the firm's stock price	Professor Lalitha Naveen's Website
Dividend payer	Binary variable that takes the value of 1 if the firm distributed dividends and zero otherwise	Refinitiv Eikon
Earnout	Binary variable equal to one if an earnout is included in a bid and zero otherwise	SDC/Refinitiv
Intang. Priv. Target	binary variable that takes the value of one if the target firm is a private firm and/or operates in an industry classified by SDC as "High-Tech" or in ff48 industries "Entertainment", "Healthcare", "Medical Equipment" or "Pharmaceutical Products", and zero otherwise.	Professor Kenneth French's website/SDC/Refinitiv
Leverage $_{t-1}$	Ratio between total debt and total assets	Refinitiv Eikon
MTB $_{t-1}$	Ratio between the market value of equity and the book value of equity	Refinitiv Eikon
Public Target	Binary variable that equals one if the target is publicly traded at the time of the deal, and zero otherwise	SDC/Refinitiv
Relative Size	Ratio between the deal value and the market capitalization of the bidder	SDC/Refinitiv Eikon
ROE	Return on equity given by the ratio between net income and the book value of equity	Refinitiv Eikon
Same industry	Binary variable that equals one if both the bidder and the target are in the same Fama-French 48 Industry classification, and zero otherwise	Professor Kenneth French's website
Vega	Dollar change in wealth associated with a 0.01 change in the standard deviation of the firm's returns	Professor Lalitha Naveen's Website

Internet Appendix 2

Table IA.2.1 - Earnouts and CEO Compensation (Probit)

This table reports marginal effects of probit regressions of earnout use, measured as an indicator equal to one if an earnout is included in a bid, zero otherwise, for deals announced between 1998 and 2022. Robust t-statistics are reported in parentheses. All Variables are described in Appendix 2.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.

	Pr(earnout=1)		
VARIABLES	(1)	(2)	(3)
Delta $_{t-1}$	-0.0031**	-0.0040***	
	(-2.44)	(-3.22)	
Vega $_{t-1}$	-0.0169		-0.0296***
	(-1.45)		(-2.77)
Cross-border	-0.0218***	-0.0220***	-0.0219***
	(-4.06)	(-4.08)	(-4.05)
Same industry	0.0025	0.0024	0.0025
	(0.52)	(0.51)	(0.52)
Leverage $_{t-1}$	-0.0345**	-0.0351**	-0.0319**
	(-2.34)	(-2.37)	(-2.16)
Acquirer age $_{t-1}$	-0.0052*	-0.0055*	-0.0048*
	(-1.78)	(-1.92)	(-1.66)
Dividend payer $_{t-1}$	-0.0303***	-0.0315***	-0.0301***
	(-5.73)	(-5.97)	(-5.68)
MTB $_{t-1}$	-0.0006	-0.0006	-0.0008*
	(-1.51)	(-1.47)	(-1.87)
Public Target	-0.1473***	-0.1479***	-0.1481***
	(-15.33)	(-15.46)	(-15.41)
Relative Size	-0.1961**	-0.1862**	-0.1913**
	(-2.10)	(-2.03)	(-2.06)

Table IA.2.1 - Earnouts and CEO Compensation (Probit) (Cont'd)

Analysts Following $_{t-1}$	-0.0056*	-0.0064**	-0.0058*
	(-1.85)	(-2.16)	(-1.94)
Observations	10,962	10,962	10,962
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Pseudo R-squared	0.1415	0.1413	0.1407

Table IA2.2 - CEO Compensation and target intangibility (Probit)

This table reports marginal effects of probit regressions of earnout use, measured as an indicator equal to one if an earnout is included in a bid, zero otherwise, for deals announced between 1998 and 2022. Robust t-statistics are reported in parentheses. Intang. Priv. Target is a binary variable that takes the value of one if the target firm is a private firm and/or operates in an industry classified by SDC as "High-Tech" or in ff48 industries "Entertainment", "Healthcare", "Medical Equipment" or "Pharmaceutical Products", and zero otherwise. The remaining variables are described in Appendix 2.A. Control variables are the same as in Table 2.3 and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

	Pr(earnout=1)				
				High Uncertainty industry	Low Uncertainty industry
VARIABLES	(1)	(2)	(3)	(4)	(5)
Intang. Priv. Target	0.0476***	0.0479***	0.0477***		
	(7.30)	(7.31)	(7.31)		
Delta t-1	-0.0030**		-0.0037***	-0.0039**	-0.0003
	(-2.38)		(-3.15)	(-2.22)	(-0.26)
Vega t-1	-0.0156	-0.0277***		-0.0143	-0.0119
	(-1.38)	(-2.67)		(-0.91)	(-0.98)
Observations	10,962	10,962	10,962	8,122	2,662
Control Variables	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo R-squared	0.1490	0.1481	0.1487	0.1380	0.1401

Table 2.1 – Sample description

This table provides the sample distribution by announcement year (panel A) and by target's Fama-French 48 industries (panel B) of deals announced between 1998 and 2022, by US bidders.

Panel A – Sample distribution by announcement Year

Year	Non-Earnout	Earnout	Total	Earnout/Total
1998	468	19	487	3.90%
1999	600	17	617	2.76%
2000	518	27	545	4.95%
2001	452	32	484	6.61%
2002	436	51	487	10.47%
2003	425	38	463	8.21%
2004	509	55	564	9.75%
2005	502	57	559	10.20%
2006	472	41	513	7.99%
2007	500	59	559	10.55%
2008	451	66	517	12.77%
2009	298	45	343	13.12%
2010	384	51	435	11.72%
2011	396	64	460	13.91%
2012	424	73	497	14.69%
2013	332	44	376	11.70%
2014	431	48	479	10.02%
2015	424	50	474	10.55%
2016	378	41	419	9.79%
2017	342	33	375	8.80%
2018	328	40	368	10.87%
2019	277	35	312	11.22%
2020	217	34	251	13.55%
2021	351	41	392	10.46%
2022	209	28	237	11.81%
Total	10124	1089	11213	9.71%

Table 2.1 – Sample description (Cont'd)

Panel B – Sample distribution by target's Fama-French 48 Industries

Target Industry	Non-Earnout	Earnout	Total	Earnout/Total
Pharmaceutical Products	457	158	615	25.69%
Apparel	78	24	102	23.53%
Medical Equipment	402	115	517	22.24%
Agriculture	33	6	39	15.38%
Recreation	68	11	79	13.92%
Shipbuilding, Railroad Equipment	14	2	16	12.50%
Transportation	201	28	229	12.23%
Business Services	2625	327	2952	11.08%
Wholesale	389	47	436	10.78%
Consumer Goods	151	18	169	10.65%
Electronic Equipment	768	81	849	9.54%
Remaining Industries	5630	344	5974	7.69%
Total	10124	1089	11213	9.71%

Table 2.2 – Descriptive statistics

This table provides descriptive statistics for bidder firms and deal characteristics of deals announced between 1998 and 2022, by US bidders. All continuous variables are winsorized at the top and bottom 1% level. All variables are described in Appendix 2.A.

	Full Sample			Deals without earnouts			Deals with earnouts		
	N	Mean	Median	N	Mean	Median	N	Mean	Median
Deal Value ($MM)	11213	880.23	97	10124	939.901	100	1089	325.494	68
Cross-border	11213	0.241	0	10124	0.245	0	1089	0.202	0
Same industry	11213	0.425	0	10124	0.427	0	1089	0.401	0
Bidder Size $_{t-1}$ ($MM)	11213	11003.426	2722.506	10124	11277.595	2929.12	1089	8454.587	1410.173
Leverage $_{t-1}$	11213	0.211	0.204	10124	0.214	0.208	1089	0.18	0.164
Bidder age $_{t-1}$	11213	40.019	27	10124	40.772	27	1089	33.017	24
Dividend payer	11213	0.461	0	10124	0.478	0	1089	0.297	0
MTB $_{t-1}$	11213	4.902	3.017	10124	4.972	3.025	1089	4.249	2.988
Public Target	11213	0.184	0	10124	0.201	0	1089	0.02	0
Relative Size	11213	0.136	0.035	10124	0.141	0.035	1089	0.090	0.037
Analysts following $_{t-1}$	11213	7.455	3	10124	7.425	3	1089	7.734	5
Delta $_{t-1}$ ($000s)	11213	1101.606	263.051	10124	1144.232	274.89	1089	705.333	157.314
Vega $_{t-1}$ ($000s)	11213	151.395	45.816	10124	154.397	47.785	1089	123.48	30.93
CAR [-1;1] (%)	10890	0.637	0.42	9823	0.632	0.431	1067	0.69	0.332

Table 2.3 – Earnouts and CEO Compensation

This table reports linear probability (OLS) regressions of earnout use, measured as an indicator equal to one if an earnout is included in a bid, zero otherwise, for deals announced between 1998 and 2022. Robust t-statistics are reported in parentheses. All Variables are described in Appendix 2.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.

	Pr(earnout=1)		
VARIABLES	(1)	(2)	(3)
Delta $_{t-1}$	-0.0026***	-0.0034***	
	(-2.75)	(-3.83)	
Vega $_{t-1}$	-0.0191		-0.0304***
	(-1.62)		(-2.80)
Cross-border	-0.0254***	-0.0255***	-0.0256***
	(-4.02)	(-4.03)	(-4.05)
Same industry	0.0014	0.0012	0.0012
	(0.24)	(0.21)	(0.21)
Leverage $_{t-1}$	-0.0455**	-0.0459**	-0.0420**
	(-2.46)	(-2.48)	(-2.29)
Ln(1+Bidder age $_{t-1}$)	-0.0047	-0.0051	-0.0044
	(-1.39)	(-1.54)	(-1.31)
Dividend payer $_{t-1}$	-0.0394***	-0.0405***	-0.0389***
	(-6.14)	(-6.33)	(-6.07)
MTB $_{t-1}$	-0.0006**	-0.0006*	-0.0008**
	(-2.00)	(-1.95)	(-2.47)
Public Target	-0.1013***	-0.1020***	-0.1020***
	(-21.96)	(-22.18)	(-22.11)
Relative Size	-0.0850*	-0.0800*	-0.0796*
	(-1.78)	(-1.67)	(-1.67)
Ln(1+Analysts Following $_{t-1}$)	-0.0101**	-0.0111**	-0.0103**
	(-2.27)	(-2.54)	(-2.32)
Observations	11,213	11,213	11,213
Year and Industry dummies	Yes	Yes	Yes
Adjusted R-squared	Yes	Yes	Yes

Table 2.4 – Earnouts, CEO Compensation and target value uncertainty

This table reports linear probability (OLS) regressions of earnout use, measured as an indicator equal to one if an earnout is included in a bid, zero otherwise, for deals announced between 1998 and 2022. Robust t-statistics are reported in parentheses. Intang. Priv. Target is a binary variable that take the value of one if the target firm is a private firm and/or operates in an industry classified by SDC as "High-Tech" or in ff48 industries "Entertainment", "Healthcare", "Medical Equipment" or "Pharmaceutical Products", and zero otherwise. Remaining variables are described in Appendix 2.A. Control variables are the same as in Table 2.3 and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

	Pr(earnout=1)								
GROUPS:				High Uncertainty industry			Low Uncertainty industry		
VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Intang. Priv. Target	0.0413***	0.0413***	0.0412***						
	(7.13)	(7.14)	(7.11)						
Delta $_{t-1}$	-0.0027***	-0.0034***		-0.0024**	-0.0031***		-0.0004	-0.0009	
	(-2.78)	(-3.86)		(-1.98)	(-2.86)		(-0.43)	(-0.95)	
Vega $_{t-1}$	-0.0188		-0.0303***	-0.0170		-0.0282**	-0.0155		-0.0168
	(-1.60)		(-2.79)	(-1.13)		(-2.10)	(-1.23)		(-1.39)
Observations	11,213	11,213	11,213	8,234	8,234	8,234	2,979	2,979	2,979

Table 2.4 – Earnouts, CEO Compensation and target value uncertainty (Cont'd)

Control Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.169	0.169	0.168	0.092	0.194	0.1943	0.0490	0.0490	0.0493

Table 2.5 – CEO Compensation, earnout and market reaction

This table reports linear regression (OLS) where the dependent variable is announcement-period market-adjusted 3-day (t – 1, t + 1) abnormal returns of US bidders in deals announced between 1998 and 2022,. All variables are described in Appendix 2.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

	CARs [-1;1]		
VARIABLES	(1)	(2)	(3)
Earnout	-0.0044**	-0.0044**	-0.0044**
	(-2.13)	(-2.14)	(-2.13)
Delta $_{t-1}$	0.0006**		0.0004*
	(2.24)		(1.67)
Vega $_{t-1}$		0.0056**	0.0041*
		(2.39)	(1.65)
Public target	-0.0198***	-0.0198***	-0.0199***
	(-10.56)	(-10.55)	(-10.57)
Cross-border	-0.0028**	-0.0028**	-0.0028**
	(-2.28)	(-2.28)	(-2.27)
Same Industry	-0.0008	-0.0009	-0.0009
	(-0.64)	(-0.66)	(-0.66)
Ln(1+Bidder size $_{t-1}$)	-0.0041***	-0.0043***	-0.0044***
	(-7.58)	(-7.38)	(-7.53)
MTB $_{t-1}$	-0.0012	0.0021	0.0000
	(-0.12)	(0.21)	(0.00)
ROE $_{t-1}$	0.0022**	0.0021*	0.0022**
	(2.03)	(1.96)	(2.03)
Ln(1+Deal value)	0.0023***	0.0023***	0.0023***
	(4.87)	(4.86)	(4.89)
Leverage $_{t-1}$	0.0036	0.0029	0.0035
	(0.80)	(0.66)	(0.79)

Table 2.5 – CEO Compensation, earnout and market reaction (Cont'd)

Constant	0.0617***	0.0643***	0.0658***
	(7.33)	(7.15)	(7.28)
Observations	10,886	10,886	10,886
Year and Industry dummies	Yes	Yes	Yes
R-squared	0.0340	0.0337	0.0343

Table 2.6 – Addressing selection bias: CEM approach

This table reports linear probability (OLS) regressions of earnout use, measured as an indicator equal to one if an earnout is included in a bid, zero otherwise, for deals announced between 1998 and 2022. Control variables are the same as in Table 2.3 and defined in Appendix 2.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

	Pr(earnout=1)		
VARIABLES	(1)	(2)	(3)
Delta $_{t-1}$	-0.0029**	-0.0039***	
	(-2.12)	(-3.13)	
Vega $_{t-1}$	-0.0197		-0.0320**
	(-1.31)		(-2.37)
Observations	8,579	8,579	8,579
Control variables	Yes	Yes	Yes
Year and Industry FE	Yes	Yes	Yes
R-squared	0.0362	0.0361	0.0360

Table 2.7 – PCA analysis

This table reports linear probability (OLS) regressions of earnout use, measured as an indicator equal to one if an earnout is included in a bid, zero otherwise, for deals announced between 1998 and 2022. Control variables are the same as in Table 2.3 and defined in Appendix 2.A and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

	Earnout
VARIABLES	(1)
PC1	-0.0068***
	(-3.47)
Observations	11,211
Control variables	Yes
Year and Industry FE	Yes
R-squared	0.070

Table 2.8 – Market reaction: alternative event-windows

This table reports linear regression (OLS) announcement-period abnormal returns of US bidders in deals announced between 1998 and 2022. The dependent variable is the 7-day (t-3, t+3) and the 2-day (0;1) announcement-period market-adjusted abnormal returns. All variables are described in Appendix 2.A. Control variables are the same as in Table 2.5 and are omitted for brevity. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5% and 10% significance levels, respectively.

	CARs [-3;3]		CARs [0;1]	
VARIABLES	(1)	(2)	(3)	(4)
Earnout	-0.0056**	-0.0056**	-0.0047**	-0.0047**
	(-2.09)	(-2.10)	(-2.34)	(-2.35)
Delta $_{t-1}$	0.0008**		0.0004*	
	(2.52)		(1.87)	
Vega $_{t-1}$		0.0047		0.0034
		(1.54)		(1.58)
Constant	0.0813***	0.0807***	0.0647***	0.0659***
	(4.83)	(4.65)	(7.66)	(7.35)
Observations	10,886	10,886	10,886	10,886
Control variables	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared	0.026	0.026	0.037	0.036

3. MANAGERIAL LEARNING IN EARNOUT DEALS

3.1. Introduction

Mergers and acquisitions (M&As) represent some of a corporation's most significant and impactful decisions. However, they also come with considerable risks, not only concerning financial performance but also regarding the execution of the transaction itself. The complexity involved in negotiating, structuring, and finalizing an M&A deal is influenced by several factors, including informational asymmetries, valuation disagreements, regulatory uncertainties, and strategic misalignments, among others. In this context, the deal structure becomes a critical factor for success, which may compromise or delay its completion.

Among the various contractual mechanisms available to address these challenges, earnouts have emerged as a vital tool. Earnouts are contractual provisions that link a portion of the purchase price to the post-acquisition performance of the target firm. This performance is usually measured by metrics such as revenue, earnings, or other milestones over a defined period.

These contingent payments are commonly used when acquirers and targets struggle to agree on valuation, often due to uncertainties about future cash flows, differences in information, or divergent expectations about performance. By deferring part of the price and making it conditional on future outcomes, earnouts enable the parties involved in the deal to share risks and encourage cooperation after the transaction. In this way, earnouts bridge the valuation gap, facilitating transactions that might otherwise stall or fall apart.

While earnouts are widely recognized as useful contractual mechanisms in mergers and acquisitions, particularly for addressing valuation uncertainty and aligning incentives in deals involving informational asymmetries (Kohers & Ang, 2000; Datar et al., 2001; Cain et al., 2011), their role in shaping the actual execution of transactions remains empirically underexamined. Existing studies often suggest that earnouts may facilitate deal completion or reduce negotiation frictions, especially in private-target acquisitions. However, these claims have not been systematically tested using large-sample data. For example, Datar et al. (2001) and Kohers and Ang (2000) note the potential for earnouts to support deal success by accommodating differences in expectations between parties, but do not investigate whether earnouts meaningfully affect the probability of deal completion or the time it takes to close. This gap is notable given how frequently earnouts are cited as tools that enhance transactional flexibility. By explicitly analyzing the effect of earnouts on deal completion rates and duration, this study offers new and timely evidence on a theoretically accepted but empirically overlooked channel through which contract design

may influence M&A outcomes. This study expands on the existing literature by providing new evidence that the use of earnouts is linked to two significant transactional advantages: (1) an increased likelihood of deal completion and (2) a reduced time to completion. These findings support the idea that earnouts help lower the barriers to reaching an agreement by alleviating concerns about misvaluation and facilitating post-deal integration.

The responsiveness of managers to market feedback is an important aspect of effective corporate governance. Stock prices reflect information from various sources and market participants, often providing real-time assessments of managerial actions. Adverse market reactions to merger and acquisition (M&A) announcements have been shown to predict deal withdrawals, revisions, or renegotiations. This suggests that acquirers do, at least in part, consider investor reactions when making decisions (Luo, 2005). This responsiveness can be seen as a type of managerial learning, with firms modifying their strategies based on publicly available information and evolving expectations.

While our findings confirm the economic value of earnouts in enhancing deal execution, a key contribution of this study lies in uncovering a less explored, yet highly consequential, implication: earnouts may dampen managerial responsiveness to market feedback. Specifically, we show that acquirers incorporating earnouts into deal structures are significantly less likely to revise or abandon transactions in the face of negative abnormal returns at announcement. This suggests that earnouts can weaken the disciplinary role of the market by reducing the sensitivity of managerial decision-making to investor reaction. To the best of our knowledge, this is the first large-sample empirical evidence to document that a contractual mechanism designed to mitigate valuation frictions may, in turn, constrain managerial flexibility and impair adaptive learning from market signals during the M&A process.

These findings reveal a dual consequence of using earnouts in M&A transactions. On the one hand, earnouts increase the likelihood and speed of deal completion, offering clear transactional benefits. On the other hand, they may reduce managers' sensitivity to signals from the capital markets – signals that often contain valuable information about the proposed transaction's perceived quality and expected value. This dual role of earnouts forms the central focus of our study and sheds some light on the mixed evidence on market reaction to the announcement of M&A deals that include earnouts (Kohers & Ang, 2000; Barbopoulos & Sudarsanam, 2012; Barbopoulos & Danbolt, 2021).

Our findings suggest that including earnouts weakens managerial learning from market feedback. In a large sample of U.S. M&A transactions, we find that acquirers using earnouts are less likely to revise or withdraw deals following negative abnormal returns at the announcement date, precisely when market signals may contain valuable information about deal quality. A likely explanation is that earnouts provide

a sense of contractual insulation, allowing managers to perceive the deal as less risky or more flexible. This perceived buffer may reduce the urgency to reconsider or renegotiate, even in the face of adverse investor reaction. In this way, earnouts can inadvertently act as a behavioral shield, dampening the disciplining effect of stock prices and weakening one of the key external governance mechanisms during the deal process. These findings highlight a previously overlooked consequence of earnout use: while they promote deal execution, they may also hinder adaptive managerial behavior at critical decision points.

Theoretically, this study contributes to the growing literature on how contractual mechanisms influence managerial behavior during mergers and acquisitions. Recent empirical studies recognize that these mechanisms can also influence strategic outcomes, including the execution and renegotiation of deals. Earnouts, in particular, have been shown to reduce information asymmetries and facilitate deal completion, especially in transactions involving private targets or valuation uncertainty (Kohers & Ang, 2000; Cain et al., 2011; Barbopoulos & Danbolt, 2021). Our findings extend this literature by providing new evidence that earnouts are associated with a lower sensitivity to market feedback at the announcement. This complements the managerial learning literature, which shows that market reactions can influence M&A decision-making (Luo, 2005; Kau et al., 2008), particularly when governance structures enable managers to incorporate external signals (Kau et al., 2008). By showing that earnouts are linked to a reduced likelihood of deal revision or withdrawal following negative abnormal returns, this study highlights how contractual choices can shape responsiveness to capital market signals, with implications for deal governance and shareholder oversight.

Our analysis also speaks to policy and governance debates. If earnouts reduce managerial accountability to market participants, they may undermine an important external discipline mechanism. This has implications for boards of directors, institutional investors, and regulators seeking to ensure that acquisition decisions are made in the best interests of shareholders. It suggests that greater transparency around earnout terms and more rigorous oversight of managerial justifications for earnout-based deals may be warranted.

This study makes three main contributions to the M&A literature. First, we provide new empirical evidence that including earnouts increases deal completion probability and shortens closure time. These results confirm the economic value of earnouts as tools to manage valuation uncertainty and reduce negotiation frictions. Second, we show that deals involving earnouts are associated with a lower propensity for managers to respond to negative market feedback, suggesting a behavioral dampening effect. This raises concerns about reduced managerial adaptability and potential overconfidence in earnout-based transactions. Third, by linking contract design with managerial learning and feedback sensitivity, our study

bridges the gap between the economic and psychological dimensions of M&A decision-making. We argue that earnouts, while economically rational, may have unintended consequences for governance and information processing.

3.2. Literature review

Earnouts are contractual provisions that defer part of the acquisition payment, making it contingent on the post-acquisition performance of the target firm, typically based on financial metrics such as revenue, EBITDA, or net income. Their primary purpose is to bridge valuation gaps between buyers and sellers by allowing contingent compensation based on future outcomes (Datar et al., 2001). By deferring payment, earnouts reduce the need for complete agreement on the target's value at the time of signing, thereby increasing the likelihood of reaching a negotiated agreement.

Empirical research has shown that earnouts are more frequently used in transactions characterized by high information asymmetry, such as acquisitions of private firms (Kohers & Ang, 2000), targets operating in R&D- or intangible-intensive sectors (Ragozzino & Reuer, 2009) or when acquirers have limited acquisition experience (Reuer et al., 2004). In these contexts, earnouts can enhance deal feasibility by accommodating uncertainty and reducing upfront risk for the acquirer, which may improve the probability of deal completion.

Despite these benefits, earnouts introduce complexity and potential post-deal conflict. Disputes may arise over performance measurement, integration processes, or the acquirer's strategic incentives, such as under-resourcing the acquired business to avoid triggering earnout payments. These contractual risks can limit their effectiveness if not properly structured (Reuer et al., 2004). Nevertheless, earnouts' flexibility during negotiations may outweigh these risks, particularly in deals that are otherwise prone to breakdown due to valuation disagreements. As such, earnouts are increasingly viewed as tools for aligning incentives and as mechanisms for improving deal closure in challenging transactional settings.

A growing strand of literature investigates the determinants of M&A deal completion, emphasizing that execution is not merely a matter of contractual design or strategic alignment, but also of managerial responsiveness to external signals, particularly those conveyed by the stock market. Numerous studies have documented that acquirer announcement returns are, on average, negative, particularly in deals involving diversification, equity financing, or high premiums (Moeller et al., 2005). These reactions are commonly interpreted as indicators of market skepticism about the strategic or financial merits of the deal. Notably, such abnormal returns at the time of announcement have been shown to influence the probability that a transaction is ultimately completed. Luo (2005) provides foundational evidence that

cumulative abnormal returns (CARs) at announcement significantly predict deal outcomes: when CARs are negative, deals are more likely to be withdrawn or renegotiated. This suggests that managers do, under certain conditions, revise their initial course of action in response to market-based assessments of the transaction.

This evidence aligns with broader research on managerial learning from stock prices. The central idea is that stock prices reflect dispersed information held by market participants, which managers can extract and use to guide corporate decision-making (Edmans et al., 2017; Zuo, 2016). In the context of M&A, this learning mechanism may operate through the announcement return, which aggregates investor expectations about the value creation potential of a deal, its likelihood of integration success, and any perceived misalignment with the acquirer's existing strategy. Kau et al. (2008) reinforce this interpretation by showing managers are more likely to abandon deals following adverse stock reactions. Such patterns point to a feedback between capital markets and corporate strategy, where public signals act as a corrective input into managerial decision-making. While this form of learning is often beneficial, allowing managers to avoid overpaying or undertaking value-destroying transactions, it is neither automatic nor universal.

The extent managers learn from the market depends heavily on contextual factors, including governance quality and institutional oversight. Kau et al. (2008) find that firms are more likely to respond to market signals in their investment decisions when agency conflicts are mitigated – e.g., when large blockholders are present or CEO incentives are strongly performance-based. Similarly, Abdallah and Abdallah (2017) show that cross-listed firms, often subject to stronger market scrutiny and better disclosure standards, exhibit greater responsiveness to stock price feedback during M&A processes. These findings support the idea that the firm's governance environment moderates the informational role of stock prices. In some settings, managers appear attentive to the informational content of prices and adjust accordingly; in others, they may disregard price signals altogether. Banerjee et al. (2023) add nuance by suggesting that overconfident managers may ignore price feedback, which can have stabilizing and destabilizing effects depending on market conditions. Meanwhile, Sani et al. (2023) show that excessive transparency or regulatory disclosure may, paradoxically, reduce the informativeness of prices and inhibit learning by discouraging informed trading.

Taken together, this literature reveals that deal completion is influenced not only by deal structure and target characteristics but also by how managers interpret and respond to external information. CARs at announcement serve as a forward-looking, market-based evaluation of the transaction's value proposition. When managerial learning mechanisms function well, these signals can reduce the likelihood of poor

deals being completed. However, the effectiveness of this learning process may be altered by contractual arrangements, such as earnouts, which could reduce the perceived need to act on market feedback. In this context, studying how specific deal features influence the relationship between announcement returns and completion outcomes can provide new insights into the dynamic interaction between contract design, market discipline, and strategic flexibility during the M&A process.

3.3. Sample, Data, and Methodology

3.3.1. Sample and Data

Our initial sample includes all M&A deals available in SDC that were announced between 1998 and 2022. Then, we apply the following screening criteria. First, the acquirer is a publicly traded U.S. firm registered in a major stock exchange (NYSE, NYSE American, or NASDAQ). Second, the acquirer is not classified by SDC as "Investor Group" or "Shareholders", and the target is not a "Joint Venture" or "Government". Third, the deal is classified in SDC as an acquisition or a merger. Fourth, neither the acquirer nor the target is in the financial or regulated sectors. Fifth, the book value of equity must be non-negative. Sixth, only deals above $1M are considered. Seventh, the deal is either completed or withdrawn. Finally, the acquirer owns less than 50% of the target before the deal is completed.

After the sample screening, we end up with 19,003 firm-year observations, of which 2,260 correspond to deals with earnouts at announcement.

[Insert Table 3.1 here]

Table 3.1 presents the distribution of deals by announcement year (panel A), Fama-French 48-industry (panel B), and target status (panel C). Data aligns with previous research and supports the idea that earnout use is linked to uncertainty. Specifically, panel A shows that earnout use has been growing over the years, with peaks after prominent crises such as the 2000s dot.com bubble, the 2007 financial crisis, and the 2020 pandemic. Panel B presents the frequency of earnout in industries associated with higher uncertainty and valuation difficulty. In fact, in our sample, the sectors that present highest percentage of deals with earnouts in relation to total deals are related to High-tech firms (more than 20% of the deals include earnouts) and firms with more intangible assets (specially service firms, in which the human capital is the main asset). Finally, panel C documents the prevalence of earnouts in deals where information asymmetry may be more severe, as is the case of private and subsidiary targets, which

include earnouts in 18% and 7.5% of the deals, respectively, against only 1.19% of deals involving a publicly traded target.

Table 3.2 presents summary statistics of deal and firm characteristics for transactions with and without earnout provisions. As documented in previous literature, several significant differences emerge. First, earnouts are strongly associated with smaller deals. In line with values reported by Barbopoulos and Danbolt (2021) and Alexakis and Barbopoulos (2019), the mean deal value in earnout deals is $162.8 million, compared to $406.5 million in non-earnout transactions. Similarly, acquirers in earnout deals are smaller (mean market value $3.38 billion vs. $5.94 billion), consistent with the idea that earnouts are more prevalent when valuation uncertainty is greater – a condition more likely in deals involving smaller and private targets (Datar et al., 2001; Cain et al., 2011).

[Insert Table 3.2 here]

Earnout deals are characterized by notably lower toehold percentages, reduced termination fees for both targets and acquirers, and a diminished role for top-tier financial advisors. This trend may indicate the more informal or less contentious nature of earnout transactions, commonly linked to private targets where such elements (e.g., termination fees, prominent advisors) are less frequently encountered (Barbopoulos & Danbolt, 2021). Additionally, earnout deals are more likely to be completed, indicating that contingent pricing may facilitate deal closure, particularly when negotiation frictions or information asymmetries are high (Kohers & Ang, 2000). The lower prevalence of tender offers and multiple-bidder contests in earnout deals also supports this interpretation; earnouts tend to be negotiated solutions in less competitive environments.

The average market reaction at announcement (CAR [-2;+2]) is slightly higher for earnout deals (1.05% vs. 0.80%), though the difference is not statistically significant (Barbopoulos & Danbolt, 2021). This suggests that while earnouts may reduce *ex-ante* uncertainty, they do not necessarily translate into systematically better market responses in the short term.

Interestingly, earnout deals are slightly more likely to be cross-industry and slightly less likely to be cross-border, suggesting that earnouts may be particularly useful in managing integration and valuation issues across different business models but are less favored in settings with legal and cultural frictions (Viarengo et al., 2018).

3.3.2. Methodology

One of the main reasons underlying the use of earnouts as referred to in previous literature is to bring buyers and sellers closer together and, in this way, promote the completion of deals that could otherwise be abandoned (Frankel, 2005; Cain et al., 2011; Cadman et al., 2014). In this sense, we start by examining whether this theoretical, untested prediction has empirical support. To do so, we implement the following logit model on the probability of deal completion:

$$\mathrm{P(completed}=1)_{it}=\alpha+\beta_1\mathrm{Earnout}_{it}+\beta_2\mathrm{CAR}_{it}+\beta_n\mathrm{X}_n+\ \mu_t+\lambda_j+\varepsilon_{it} \qquad (1)$$

The dependent variable is a binary variable that takes the value of one if the deal was completed and zero if it was withdrawn; *CAR* and *Earnout* are our main variables of interest: *CAR* is the cumulative abnormal return over a 5-days event window around the announcement date (-2;2) and *Earnout* takes the value of 1 if the deal includes an earnout clause at announcement and zero if it does not.; $\mathrm{X_n}$ is a vector of control variables, including *Relative value* (the ratio between deal value and acquirer's market value), *Cash* (a binary variable that takes the value of one if the deal is mainly paid with cash), *Acquirer Termination fee* (a binary variable that takes the value of one if the bid includes a breakup fee to be paid by the bidder), *Target Termination fee* (a binary variable that takes the value of one if the bid includes a breakup fee to be paid by the target), *Cross-border* (a binary variable that takes the value of one if the target is not from USA), *Toehold* (a dummy variable that takes the value of one if the bidder has a percentage of shares in the target at announcement), *Cross Industry* (a binary variable that takes the value of one if the target is from a different industry of the bidder, based on Fama-French 48 industry classification), *Multiple Bidders* (a binary variable that takes the value of one if there are other bidders), *Tender offer* (a binary variable that takes the value of one if the deal is classified as tender offer), *Friendly* (a binary variable that takes the value of one if the deal is classified by Refinitiv/SDC as friendly), *Defensive* (a binary variable that takes the value of one if the target employs any defensive tactic), *Acquirer top advisor* (a binary variable that takes the value of one if acquirer 's advisor is one of the top ten advisors by number of deals undertaken in the announcement year), and *Target top advisor* (a binary variable that takes the value of one if target's advisor is one of the top ten advisors by number of deals undertaken in the announcement year); μ_t and λ_j are dummies to control for year and industry fixed effects, respectively.

Relative Value is included as larger transactions typically involve more complexity, due diligence, and negotiation, affecting completion probability and duration (Officer, 2003; Moeller et al., 2004). We include Cash to control for the fact that the higher the percentage of cash payment, the lower the uncertainty to target shareholders, and, as such, the higher the probability of the deal being completed (Wong & O'Sullivan, 2001). Acquirer and target termination fees reflect contractual safeguards and bargaining

dynamics; they serve as credible commitment devices and can influence the likelihood and speed of deal completion (Boone & Mulherin, 2007; Bates & Lemmon, 2003; Luo, 2005). Cross-border transactions are controlled for, given their association with greater regulatory, cultural, and informational frictions, although no consensus exists on the effect (Erel et al., 2012; Lawrence et al., 2021; Dikova et al., 2010; Rossi & Volpin, 2004). We include a toehold indicator, capturing the acquirer's pre-announcement ownership stake, which can affect bargaining power and completion outcomes (Betton et al., 2009). Cross-industry mergers are often more challenging to evaluate and integrate, thus more likely to involve earnouts or exhibit delays (Kohers & Ang, 2000). The presence of multiple bidders is associated with increased competitive pressure, potentially increasing deal failure risk or altering deal terms (Kau et al., 2008; Abdallah & Abdallah, 2017). Given their standardized and unilateral nature, tender offers are generally more likely to succeed and complete faster than negotiated deals (Schwert, 2002). We also control whether the deal is friendly or hostile, as hostile takeovers often face resistance that affects timing and outcome (Morck et al., 1988). Defensive mechanisms, such as poison pills or staggered boards, can reduce the probability of deal success or prolong negotiations (Bebchuk et al., 2002). Finally, we control for the presence of top-tier financial advisors on both the acquirer and target side, since advisor reputation is linked to deal quality, execution efficiency, and value creation (Golubov et al., 2012; Barbopoulos & Danbolt, 2021). Year and industry fixed effects are also included to control for unobserved time-varying macroeconomic factors and industry-specific merger dynamics.

We calculate each bidder's cumulative abnormal return (CAR) using a market-adjusted return approach. Consistent with prior literature (Faccio et al., 2006; Kau et al., 2008; Becher et al., 2020; Barbopoulos & Danbolt, 2021), we estimate abnormal returns as the difference between the firm's daily stock return and the return on the Refinitiv/DataStream value-weighted market index:

$$\mathrm{AR_{it}} = \mathrm{R_{it}} - \mathrm{R_{mt}} \tag{2}$$

We then compute the cumulative abnormal return over a five-day event window, spanning from two days before to two days after the announcement date (i.e., t = -2 to t = 2):

$$\mathrm{CAR_i} = \sum_{t=-2}^{t=+2} \mathrm{AR_{it}} \tag{3}$$

To assess whether the inclusion of earnouts influences the time to completion, we estimate the following model:

$$\text{Time to completion}_{it} = \alpha + \beta_1 \text{CAR}_{it} + \beta_2 \text{Earnout}_{it} + \beta_n X_n + \mu_t + \lambda_j + \varepsilon_{it} \quad (4)$$

The dependent variable (*Time to completion)* is the logarithm of 1+ the difference between completion date and announcement date.

A central premise of this study is that the effect of including an earnout clause may be particularly consequential when the market reacts negatively to the deal announcement. By providing contractual flexibility and contingent pricing, we argue that earnouts may insulate managers from downside risk and reduce the pressure to abandon or renegotiate a transaction viewed unfavorably by investors. In such cases, managers might perceive the earnout as a safeguard against poor outcomes or believe they possess superior private information gained during negotiation, which could reduce their responsiveness to market signals. In contrast, when the market reaction is positive, we would not expect the presence of an earnout to affect the likelihood of deal completion materially; it is unlikely that managers would cancel or revise a transaction that investors have well received. This asymmetry forms the basis for our hypothesis that earnouts weaken the link between market feedback and managerial action, particularly in the presence of adverse stock price reactions.

We assess the relationship between abnormal stock returns and subsequent deal decisions to examine whether managers learn from market feedback at the time of deal announcement. Following prior research (e.g., Luo, 2005; Kau et al., 2008), we use cumulative abnormal returns (CARs) around the announcement date as a proxy for market reaction regarding the deal. We then estimate the probability that the deal is withdrawn, conditional on the magnitude and sign of these CARs. Specifically, we run the following equation:

$$\text{Ignore the market} = \alpha + \beta_1 \text{Earnout}_{it} + \beta_n Z_n + \mu_t + \lambda_j + \varepsilon_{it} \quad (5)$$

Following Kau et al. (2008) and Abdallah and Abdallah (2017), *ignore the market* is a binary variable that takes the value of one if the CAR is higher (lower) than 2.5% (-2.5%) and the deal is withdrawn (completed), and zero if completed (withdrawn). *Earnout* is our variable of interest, and Z_n is a vector of control variables known to affect the probability to listen/not listen to the market, including *Relative value*, *Cash*, *Acquirer Termination fee*, *Target Termination fee*, *Cross Industry*, *Multiple Bidders*, *Public target Toehold, Tender offer*, *Friendly*, and *Defensive,* all defined as above, and; μ_t and λ_j are dummies to control for year and industry fixed effects, respectively.

3.4. Results

3.4.1. Earnout and the likelihood of completing the deal

We start by investigating whether earnouts influence the probability of a deal being completed and the effect of announcement period CARs on the completion outcome. Given the abundant evidence that earnouts are used as a form to overcome disagreements that may arise between bidder and target (Datar et al., 2001; Cain et al., 2011; Cadman et al., 2014), we expect earnouts to increase the probability of deal completion. Panel A of Table 3.3 reports estimates from logit regressions of the probability that a deal is completed. In the full sample, the coefficient on the earnout variable is significant at the 1% level, suggesting that, on average, deals involving earnouts are about 0.73 percentage points more likely to be completed, all else equal. Moreover, in line with results reported by Kau et al. (2008), the CAR variable has a positive and significant coefficient in the full sample, indicating that each additional percentage point (pp) in announcement-period CAR is associated with a 1.8pp increase in the probability of completion. This indicates that managers consider the market reaction when eventually deciding to close the deal, that is, managers listen to the market. The remaining control variables have the expected signs and align with previous research.

[Insert Table 3.3 here]

To better assess the role of earnouts under varying market reactions, we split the sample based on whether the market reaction to the deal announcement is positive or negative. We conjecture that the effect of including earnout clauses is especially relevant in closing a deal if the market reacts unfavorably. That is, if managers see earnouts as an insurance against unexpected bad outcomes, they may feel insulated from the downside risk of the deal. Also, they may see themselves in possession of information provided by earnout negotiations that the market does not have, which, in turn, can lead to them not listening to the market if it reacts negatively. On the other hand, we would not expect the inclusion of earnouts to be considered as relevant when the market reacts positively. It is hard to imagine that having an earnout will influence the decision to cancel a deal with a significant positive return. The same rationale applies to CARs. The results are present in model 2 and model 3 and support our conjectures. The Earnout coefficient is positive and statistically significant only on the negative CAR subsample, indicating that if the market reacts negatively at announcement, the probability of going ahead against the market is higher if the deal is set up with earnouts. Again, in line with Kau et al. (2008), the coefficient of CAR is

positive and statistically significant for the subsample, including only dealing with an adverse market reaction to the announcement.

To further support our analysis, we compare the predictive power of announcement CARs on completion within the subsamples of earnout and non-earnout deals. This analysis allows us to examine whether the inclusion of an earnout alters managerial responsiveness to market feedback, potentially mitigating or amplifying the effect of market signals on the decision to proceed with a transaction. Prior research suggests that informed stock price reactions can discipline managerial choices; however, the presence of an earnout may reduce the need for post-announcement adjustments by addressing uncertainty contractually. Results in Table 3.3, Panel B support our previous findings. The announcement CAR significantly predicts deal completion only in the non-earnout group (coefficient = 0.0215), but is insignificant for earnout deals (coefficient = -0.0182). This evidence supports the idea that earnouts may shield decision-makers from investor pressure, potentially reducing managerial learning from price signals in line with Edmans et al. (2013) and Sani et al. (2023), who highlight how structural and informational frictions can affect responsiveness to market feedback.

Concerning time to completion, the impact of earnouts may not be a clear cut. If, on the one hand, resorting to earnouts may avoid prolonged bargaining between parties, on the other hand, it may increase deal complexity and delay completion due to the need for negotiation of earnout clauses (Kohers & Ang, 2000). Our results support the former. Panel A of Table 3.4 examines the effect of earnouts on the time to deal completion, measured as the natural logarithm of one plus the number of days between announcement and effective date. The analysis is conducted separately for the full sample (Column 1) and for positive and negative CAR subsamples (Columns 2 and 3). Across all models, earnouts are significantly associated with faster deal completion. In the full sample, the coefficient on the earnout dummy is -0.38, suggesting that earnout deals, on average, take approximately 31.6% less time to complete than non-earnout transactions, holding other factors constant[28]. This negative association occurs when the market reacts positively and negatively to the deal announcement. These findings are consistent with the notion that earnouts help resolve valuation uncertainty and reduce post-announcement renegotiation (Datar et al., 2001; Cain et al., 2011). The slightly more substantial effect in negatively perceived deals suggests that earnouts may be particularly helpful in overcoming hesitation or resistance due to perceived overpayment or risk, aligning with the view that earnouts act as a risk-sharing device (Kohers & Ang, 2000; Ragozzino & Reuer, 2009). The CAR variable is not statistically significant in any

[28] A coefficient of -0.3824 in a log-linear model implies a $[(e^{-0.3824}) - 1] \times 100 \cong 31{,}61\%$ shorter duration, on average.

specification, indicating that the market's initial perception of the deal is not directly related to how long the transaction takes to close. As before, control variables behave largely as expected.

[Insert Table 3.4 here]

Panel B explores the relationship between announcement-period CARs and time to completion, split by whether the deal includes an earnout. The findings reinforce the interpretation that managers employing earnouts are less influenced by initial investor reaction, likely because the contingent nature of the payment provides internal confidence in deal value, even if external (market) validation is weak or absent. This indicates that managers may rely less on price signals when alternative contractual mechanisms mitigate information asymmetry.

3.4.2. Do managers go deaf when using earnouts?

A growing body of literature in corporate finance explores whether managers adjust key investment and acquisition decisions in response to feedback from financial markets. In their influential study, Kau et al. (2008) provide evidence of managerial learning: managers extract information from stock prices to guide strategic decisions, including whether to abandon announced transactions. Extending this line of research, Abdallah and Abdallah (2017) examine whether cross-listing improves managerial responsiveness to market signals in M&A settings. They find that cross-listed firms, subject to stronger market discipline and investor scrutiny, are significantly more likely to withdraw deals following unfavorable stock price reactions. This reinforces the view that market feedback can shape deal outcomes when managers are attentive and governance structures are supportive.

Building on these insights, this section investigates whether the inclusion of earnouts influences managers' propensity to act on negative market feedback. We conjecture that the effect of earnouts is particularly relevant when the market reacts unfavorably to a deal. Managers may perceive the earnout as contractual insurance that mitigates downside risk, reducing the urgency to cancel or renegotiate. Alternatively, they may place greater trust in the information acquired during earnout negotiations – believing it outweighs the market's signal, thus leading them to persist with deals that investors poorly receive. In contrast, when the market reacts positively, an earnout is unlikely to affect the completion decision: it is difficult to imagine that managers would withdraw a deal that generates strong approval from shareholders. This asymmetric logic also generally applies to announcement-period CARs and

motivates our empirical tests of whether earnouts moderate managerial learning from adverse stock price reactions.

We construct a proxy for *ignoring the market*, based on the methodology used by Kau et al. (2008) and Abdallah and Abdallah (2017). This proxy captures instances where managerial actions run counter to strong investor reaction at the time of the deal announcement. Specifically, we define a binary variable that equals 1 when (i) a deal receives a strongly positive stock market reaction (CAR > +2.5%) but is subsequently withdrawn, or (ii) when a deal receives a strongly adverse reaction (CAR < –2.5%) but is nonetheless completed. These cases are interpreted as instances where managers disregard clear market signals. Transactions with CARs between –2.5% and +2.5% are excluded from the analysis. Models (1) and (2) show a restricted specification without controls, while models (3) and (4) present the full model including all control variables.

Table 3.5 reports the logistic regression of the propensity to ignore the market. Across all specifications, earnouts are consistently associated with a higher likelihood of ignoring the market. In the full sample, the coefficient on the earnout dummy increases in magnitude and significance with the inclusion of controls: from 0.0160 (insignificant) in Column (1) to 0.0457 (significant at the 1% level) in Column (3). This suggests that the effect of earnouts becomes clearer when other deal characteristics are included. In the CAR<0 subsample, which captures deals that investors poorly received, the coefficient remains statistically significant across both specifications (0.0410 in Column (2) and 0.0192 in Column (4)). However, its magnitude decreases when additional controls are considered. These results reinforce the idea that earnouts may dampen managerial responsiveness to negative market signals, increasing managers' likelihood of proceeding with contested deals.

[Insert Table 3.5 here]

The Pseudo R-squared increases substantially in the CAR<0 subsample (from 0.039 in the restricted model to 0.200 in the full model), indicating that the expanded set of controls meaningfully improves the explanatory power of the specification when focusing on deals with adverse market reactions.

Overall, the results in Table 3.5 offer compelling support for the hypothesis that earnouts reduce managerial responsiveness to market feedback, particularly in situations where that feedback is negative. This behavior persists even after controlling for deal structure, financing, target status, and termination provisions. The findings align with the broader literature on managerial learning (e.g., Luo, 2005; Kau et al., 2008) and suggest that while earnouts can help close deals under uncertainty, they may also reduce the corrective role of stock prices in acquisition decisions.

3.5. Robustness tests

3.5.1. Controlling for shareholder monitoring

A growing body of literature highlights the role of institutional investors in shaping managerial behavior and disciplining decision-making (Bushee, 1998; Cremers & Nair, 2005). In the context of mergers and acquisitions, where information asymmetries and agency problems are pronounced, institutional investors are expected to serve as monitors that encourage value-enhancing decisions and deter managerial opportunism (Shleifer & Vishny, 1986). This monitoring role is especially relevant when managers face conflicting signals, such as an adverse market reaction to an acquisition, where the decision to proceed may reflect a disregard for shareholder feedback. In this sense, we further consider the possible impact of monitoring on the decision to ignore the market. To do so, we use two alternative additional control variables: *strategic ownership* and *active ownership*. Specifically, strategic (active) ownership is a binary variable that takes the value of 1 if the strategic (active) ownership as reported by Refinitiv/DataStream is higher than the median and zero otherwise.

The results in Table 3.6 confirm our previous findings that earnouts are positively associated with the probability of not listening to the market. Specifically, the earnout coefficient remains statistically significant and positive in both specifications: 4.63 percentage points in Column (1) and 3.77 percentage points in Column (2), even after controlling for institutional ownership. This indicates that the presence of institutional investors does not fully mitigate the tendency of acquirers using earnouts to proceed with deals that are poorly received by the market.

[Insert Table 3.6 here]

Interestingly, in line with Kau et al. (2008), neither strategic nor active ownership is significantly associated with the probability of ignoring the market. The coefficient associated with strategic ownership is negative but small and statistically insignificant, while active ownership is positive but also insignificant. This suggests that institutional monitoring, at least as captured by these ownership measures, may not be sufficient to constrain managerial behavior in the context of earnout-financed deals. These findings are consistent with prior literature suggesting that not all institutional ownership plays an effective monitoring role (e.g., Bushee, 1998; Ferreira & Matos, 2008). Passive or short-term oriented investors may not pressure managers, while long-term owners may lack the incentive or information to intervene in complex M&A processes. It may also be the case that the contractual flexibility introduced by earnouts weakens

the perceived risks of proceeding with controversial transactions, thus dampening the influence of external monitors.

3.5.2. Probability of abandoning the earnout

Despite our previous evidence, one could argue that the adverse reaction in earnout deals is due to the inclusion of earnouts and that managers complete the deal because they, in fact, listen to the market and abandon the use of earnouts. If this is the case, we would see that, within the earnout deals, the worse the market reaction, the higher the probability that managers drop the earnout from the deal. To examine whether the likelihood of dropping an earnout – initially included at the deal announcement – is associated with the cumulative abnormal return (CAR), we start by searching in the deal synopsis provided by Refinitiv for the words or expressions associated with earnouts, such as "contingent payments", "profit related payments", and alike. We classify those as "earnout deals". Whether the earnout was ultimately considered is provided by Refinitiv. The deals that dropped the earnouts are those among our "earnout deals" that do not include earnout as the final form of payment. Finally, we run the following logit regression:

$$\mathrm{P}(\text{drop earnout} = 1)_{\mathrm{it}} = \alpha + \beta_1 \mathrm{CAR}_{\mathrm{it}} + \beta_{\mathrm{n}} \mathrm{X}_{\mathrm{n}} + \mu_{\mathrm{t}} + \lambda_{\mathrm{j}} + \varepsilon_{\mathrm{it}} \qquad (6)$$

where the dependent variable "drop earnout" is a dummy variable that takes the value of one if the deal was proposed with earnout and ended without earnout, and zero otherwise. As before, $\mathrm{X}_{\mathrm{n}}$is a vector of control variables that influence both the initial decision to include an earnout and the subsequent decision to remove it, including *Cross-border* (a binary variable that takes the value of one if the target is not from USA), *Cross Industry* (a binary variable that takes the value of one if the target is from a different industry of the bidder, based on Fama-French 48 industry classification), *Relative value* (the ratio between deal value and acquirer's market value), *Leverage* (the ratio between total debt and total assets), *MTB* (Market-to-book, the ratio between the market value of equity and the book value of equity), *Toehold* (a binary variable that takes the value of one if the bidder has a percentage of shares in the target at announcement), *Public Target* (a binary variable that takes the value of one if the target is publicly traded), and the "*Analysts Following"* (the natural logarithm of one plus the number of analysts that follow the bidder).

Table 3.7 presents the results of this robustness test. CARs measured around the announcement do not appear to be systematically related to the probability of dropping an earnout, neither in the full sample (coefficient –0.0039, insignificant) nor in the negative CAR subsample (coefficient 0.0135, insignificant).

These results support our previous findings by showing that managers who initially choose to include an earnout are unlikely to revise this contractual feature in response to market signals.

[Insert Table 3.7 here]

3.5.3. Addressing sample selection concerns

As we see from Table 3.2, earnout and non-earnout deals and firm characteristics are quite heterogeneous subsamples that may bias our results if not adequately controlled. To overcome such concerns, we follow extant literature (Prencipe & Viarengo, 2022; Bates et al., 2018; Elnahas et al., 2017) and create a matched sample of deals that do not include earnouts, based on firm and deal characteristics. Specifically, we use the coarsened exact matching (CEM) technique proposed by Blackwell et al. (2009). CEM offers a semi-parametric preprocessing method to address this concern by improving the balance between treatment (earnout) and control (non-earnout) groups *ex-ante*. The method coarsens covariates into substantively meaningful categories and then exactly matches treated and control observations within these strata (Iacus et al., 2012). This results in a matched sample with improved covariate balance and common support, strengthening causal inference by making the comparison between earnout and non-earnout deals more credible. We match earnout and non-earnout deals on key covariates that have been shown by extant literature to influence the decision to use earnouts (Viarengo et al., 2018; Bates et al., 2018; Barbopoulos et al., 2017; Alexakis & Barbopoulos, 2019). These covariates include bidder size, measured by market capitalization, relative deal value (deal size relative to bidder size), cross-border indicator, cross-industry indicator, public target status, year, and industry. After matching, we re-estimate the main regressions of deal completion probability and the probability of ignoring the market on the matched sample.

Table 3.8 reports the results from repeating the main regressions using the CEM approach. Panel A shows that, consistent with the baseline regressions, CAR measured around the announcement date remains positively and significantly associated with the probability of deal completion across both the full sample and the negative CAR subsample. Panel B focuses on the probability of ignoring the market signals. Again, after controlling for matching covariates, earnouts remain positively associated with a higher probability of ignoring the market: 0.0321 for the full sample and 0.0252 for the negative CAR sample, both significant at the 5% level. Overall, the CEM estimates confirm the robustness of the main results, strengthening confidence that the observed patterns are not merely driven by sample selection or imbalance in observable characteristics.

[Insert Table 3.8 here]

3.5.4. Refining the identification strategy

A final concern when testing whether managers ignore market signals (proxied by announcement CARs) is the presence of deals that are announced and completed on the same day. In these transactions, there is no meaningful time window between the market reaction at announcement and the managerial decisions that drive deal completion. Consequently, the observed association between announcement CARs and completion outcomes (or the decision to proceed) could mechanically reflect a predetermined path, rather than evidence of managerial disregard for market signals. To address this concern, we conduct a robustness test excluding deals completed on the same day as their announcement.

Panel A of Table 3.9 confirms that the key results hold even when excluding transactions announced and completed on the same day. Specifically, earnouts remain positively associated with the probability of deal completion, with coefficients of 0.0086 in the full sample and 0.0182 for negative CAR deals, both statistically significant at 1% level. This suggests that earnouts support deal success even after ruling out deals with no interim managerial discretion. Announcement CARs also maintain a strong positive effect on deal completion, consistent with the disciplining role of favorable market reactions.

[Insert Table 3.9 here]

Panel B examines the probability of "not listening" to negative market signals. The Earnout coefficient is positive and significant (0.0410) in the full sample and in the negative CAR subsample (0.0234). This pattern suggests that earnouts may reduce managerial responsiveness to investor signals even after removing same-day deals by increasing the likelihood of proceeding with transactions regardless of market skepticism.

3.6. Conclusion

This study enhances our understanding of earnouts in mergers and acquisitions by offering comprehensive evidence on their impact on key transactional outcomes, such as deal completion, resolution time, and managerial responsiveness to market feedback. These elements are important aspects of corporate governance and organizational learning. Consistent with prior literature (e.g., Datar et al., 2001; Kohers & Ang, 2000; Cain et al., 2011), our analysis confirms that earnouts act as an effective contracting mechanism to bridge valuation gaps and mitigate information asymmetries, leading to a higher likelihood of deal completion and a shorter time to finalize transactions.

This study extends the literature by uncovering an important implication of earnout use that has received limited empirical attention. While earnouts are associated with a higher likelihood of deal completion, the results also indicate that their inclusion may reduce managers' sensitivity to market feedback at the time of the announcement. Specifically, deals involving earnouts are more likely to proceed despite strongly negative cumulative abnormal returns, suggesting that managers are less inclined to withdraw or revise such transactions in response to adverse investor reactions. This reduced responsiveness reflects a weaker link between stock price signals and managerial action, a phenomenon previously highlighted by Kau et al. (2008) and Luo (2005) in the context of managerial learning. Importantly, this pattern remains consistent even after addressing potential selection concerns through coarsened exact matching and controlling for institutional monitoring mechanisms, reinforcing the robustness of the findings.

Further robustness tests, including investigating the probability of dropping an earnout provision during deal negotiations, support this interpretation: managers rarely revise their initial inclusion of earnouts even when facing unfavorable market feedback. These results reveal that while earnouts serve as an economically rational tool to facilitate acquisitions, they also risk dulling managers' adaptive responses to informative price signals, raising concerns about the effectiveness of external discipline mechanisms in M&A governance.

These findings have important implications for corporate governance and deal oversight. While earnouts facilitate deal completion by reducing valuation uncertainty, their inclusion may diminish managers' responsiveness to market signals at a critical decision point. This weaker sensitivity to adverse investor reactions raises concerns about whether managers act in shareholders' best interest when proceeding with unfavorably received deals. As a result, the use of earnouts, particularly in transactions that trigger negative announcement returns, should be accompanied by heightened scrutiny from boards, institutional investors, and other governance actors. Rather than assuming that earnouts inherently align incentives, these results suggest that their use may require closer monitoring to ensure that managerial persistence reflects informed conviction rather than strategic rigidity or misaligned objectives. More broadly, the findings call for a nuanced understanding of how contract design interacts with external market discipline in shaping M&A outcomes.

Appendix 3.A – Variable Definitions

VARIABLE	DEFINITION	SOURCE
Acq. Termination fee	A binary variable that takes the value of one if the bid includes a breakup fee to be paid by the bidder and zero otherwise	SDC/Refinitiv
Acquirer top advisor	A binary variable that takes the value of one if acquirer 's advisor is one of the top ten advisors by number of deals undertaken in the announcement year, and zero otherwise	SDC/Refinitiv
Active ownership	A binary variable that takes the value of 1 if the active ownership as reported by Refinitiv/DataStream is higher than the median and zero otherwise	Refinitiv/DataStream
CAR [-2;2]	cumulative abnormal return over a 5-days event window around the announcement date (-2;2)	Refinitiv/DataStream
Cash	A binary variable that takes the value of one if the deal is mainly paid with cash, and zero otherwise	SDC/Refinitiv
Completed	A binary variable that takes the value of one if the deal was completed and zero if it was withdrawn	SDC/Refinitiv
Cross industry	A binary variable that takes the value of one if the target is from a different industry of the bidder, based on Fama-French 48 industry classification, and zero otherwise	Professor Kenneth French's website
Crossborder	A binary variable that takes the value of one if the target is not from USA, and zero otherwise	SDC/Refinitiv
Defensive	A binary variable that takes the value of one if the target employs any defensive tactic	SDC/Refinitiv
Drop Earnout	A binary variable that takes the value of one if the deal was proposed with earnout but completed without earnout, and zero if proposed and completed with earnout.	SDC/Refinitiv
DV	Value of the deal (in millions of dollars)	SDC/Refinitiv

Appendix 3.A – Variable Definitions (cont'd)

Earnout	A binary variable that takes the value of 1 if the deal includes an earnout clause at announcement, and zero otherwise	SDC/Refinitiv
Friendly	A binary variable that takes the value of one if the deal is classified as friendly, and zero otherwise	SDC/Refinitiv
Ignore the market	A binary variable that takes the value of one if the CAR is higher (lower) than 2.5% (-2.5%) and the deal is withdrawn (completed), and zero if completed (withdrawn)	SDC/Refinitiv/DataStream
Leverage t-1	The ratio between total debt and total assets	Refinitiv/DataStream
MTB t-1	Market-to-book, the ratio between the market value of equity and the book value of equity	Refinitiv/DataStream
Multiple bidders	A binary variable that takes the value of one if there are other bidders, and zero otherwise	SDC/Refinitiv
MV t-1	Bidders' market capitalization	Refinitiv/DataStream
Public target	A binary variable that takes the value of one if the target is publicly traded	SDC/Refinitiv
Relative value	The ratio between deal value and acquirer's market value	Refinitiv/DataStream
Strategic ownership	A binary variable that takes the value of 1 if the strategic ownership as reported by Refinitiv/DataStream is higher than the median and zero otherwise	SDC/Refinitiv
Targ. Termination fee	A binary variable that takes the value of one if the bid includes a breakup fee to be paid by the target, and zero otherwise	SDC/Refinitiv
Target top advisor	A binary variable that takes the value of one if target's advisor is one of the top ten advisors by number of deals undertaken in the announcement year, and zero otherwise	SDC/Refinitiv

Appendix 3.A – Variable Definitions (cont'd)

Tender offer	A binary variable that takes the value of one if the deal is classified as tender offer, and zero otherwise	SDC/Refinitiv
Time to completion	Logarithm of 1+ the difference between completion date and announcement date	SDC/Refinitiv
Toehold	A dummy variable that takes the value of one if the bidder has a percentage of shares in the target at announcement, and zero otherwise	Refinitiv/DataStream
Toehold (%)	Bidder's percentage of shares in the target at announcement	Refinitiv/DataStream

Table 3.1 – Sample Description

This table provides the sample distribution by announcement year (panel A), by target's Fama-Franch 48 industries (panel B) and by target's status (panel C), of deals announced between 1998 and 2022, by US acquirers.

Panel A – Sample distribution by announcement Year

Year announced	Non-Earnout	Earnout	Total	Earnout/Total
1998	1 485	120	1 605	7.48%
1999	1 352	85	1 437	5.92%
2000	1 244	92	1 336	6.89%
2001	844	91	935	9.73%
2002	726	109	835	13.05%
2003	707	91	798	11.40%
2004	829	130	959	13.56%
2005	844	140	984	14.23%
2006	833	110	943	11.66%
2007	837	128	965	13.26%
2008	626	114	740	15.41%
2009	422	82	504	16.27%
2010	528	94	622	15.11%
2011	530	111	641	17.32%
2012	574	99	673	14.71%
2013	474	70	544	12.87%
2014	600	93	693	13.42%
2015	548	83	631	13.15%
2016	457	65	522	12.45%
2017	424	46	470	9.79%
2018	435	54	489	11.04%
2019	342	53	395	13.42%
2020	292	53	345	15.36%
2021	455	81	536	15.11%
2022	335	66	401	16.46%
Total	16 743	2 260	19 003	11.89%

Table 3.1 – Sample Description (Cont'd)

Panel B – Sample distribution by target's Fama-French 48 Industries

Target Industry	Non-Earnout	Earnout	Total	Earnout/Total
Apparel	110	42	152	27.63%
Pharmaceutical Products	737	260	997	26.08%
Medical Equipment	605	173	778	22.24%
Tobacco Products	7	2	9	22.22%
Construction	224	40	264	15.15%
Recreation	113	20	133	15.04%
Business Services	4803	812	5615	14.46%
Agriculture	55	9	64	14.06%
Personal Services	223	36	259	13.90%
Electronic Equipment	1197	160	1357	11.79%
Healthcare	483	64	547	11.70%
Transportation	393	51	444	11.49%
Computers	580	75	655	11.45%
Measuring and Control Equipment	389	50	439	11.39%
Wholesale	652	83	735	11.29%
Aircraft	112	13	125	10.40%
Entertainment	175	20	195	10.26%
Other	5885	350	6235	5.61%
Total	16743	2260	19003	11.89%

Panel C – Sample distribution by target's status

Target status	Non-Earnout	Earnout	Total	Earnout/Total
Private	7974	1761	9735	18.09%
Public	3078	37	3115	1.19%
Subsidiary	5691	462	6153	7.51%
Total	16743	2260	19003	11.89%

Table 3.2 – Descriptive statistics

This table provides descriptive statistics for acquirer firms and deal characteristics. All variables are defined in Appendix 3.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% level, respectively using t-test for differences in means

	Deals without earnouts				Deals with earnouts					
	N	Mean	Median	SD	N	Mean	Median	SD	Diff. in means	
Continuous variables										
DV ($MM)	16743	406.494	57.179	1151.083	2260	162.822	35	516.252	-243.672	***
MV_{t-1} ($MM)	16743	5936.076	994	11920.29	2260	3376.506	462.93	9124.339	-2559.57	***
Relative value	16743	1.623	0.067	138.423	2260	0.384	0.083	3.599	-1.239	
Toehold (%)	16743	0.485	0	3.891	2260	0.244	0	2.733	-0.241	***
CAR [-2;2] (%)	16743	0.798	0.364	9.837	2260	1.047	0.453	9.981	0.249	
Binary variables										
Completed	16743	0.966	1	0.182	2260	0.986	1	0.118	0.02	***
Termination fee (acq)	16743	0.046	0	0.211	2260	0.009	0	0.096	-0.037	***
Termination fee (trg)	16743	0.12	0	0.325	2260	0.021	0	0.143	-0.099	***
Cross-border	16743	0.216	0	0.412	2260	0.179	0	0.384	-0.037	***
Toehold	16743	0.021	0	0.144	2260	0.011	0	0.103	-0.01	***
Cross industry	16743	0.4	0	0.49	2260	0.371	0	0.483	-0.029	***

Table 3.2 – Descriptive statistics (cont'd)

Multiple bids	16743	0.015	0	0.122	2260	0.002	0	0.042	-0.013	***
Tender offer	16743	0.04	0	0.196	2260	0.003	0	0.051	-0.037	***
Friendly	16743	0.978	1	0.147	2260	0.996	1	0.059	0.018	***
Defensive	16743	0.015	0	0.121	2260	0.003	0	0.051	-0.012	***
Top advisor (acq)	16743	0.181	0	0.385	2260	0.103	0	0.304	-0.078	***
Top advisor (trg)	16743	0.177	0	0.382	2260	0.092	0	0.289	-0.085	***

Table 3.3 – Completion Probability

This table reports coefficient estimates from logit regresion on the probability to complete a deal. The dependent variable is Completed, a binary variable that takes the value of one if the deal is ultimatly completed and zero if it is withdrawn. In Panel B control variables are the same as in Panel A and omitted for brevity. All variables are defined in Appendix 3.A. All continuous variables are winsorized at the top and bottom 1% of the distribution; t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A - Full sample and CAR sign

	Pr(Completed)		
	Full Sample	CAR>0	CAR<0
VARIABLES	(1)	(2)	(3)
Earnout	0.0073***	0.0026	0.0122***
	(2.69)	(0.75)	(3.04)
CARs [-2;2]	0.0183***	0.0054	0.0369***
	(2.73)	(0.47)	(3.30)
Relative value	-0.0054***	-0.0048***	-0.0051***
	(-13.57)	(-8.70)	(-8.90)
Acq. Termination fee	-0.0055*	-0.0024	-0.0065*
	(-1.84)	(-0.52)	(-1.89)
Targ. Termination fee	0.0008	-0.0018	0.0028
	(0.32)	(-0.46)	(0.88)
Cross-border	0.0076***	0.0060***	0.0080***
	(4.53)	(2.65)	(3.64)
Toehold	-0.0062***	-0.0069***	-0.0053**
	(-3.71)	(-2.97)	(-2.40)
Cross Industry	-0.0001	-0.0001	-0.0003
	(-0.04)	(-0.07)	(-0.17)
Multiple bidders	-0.0489***	-0.0518***	-0.0450***
	(-13.45)	(-9.41)	(-9.34)
Tender offer	-0.0104***	-0.0133***	-0.0069

Table 3.3 – Completion Probability (Cont'd)

	(-3.05)	(-2.93)	(-1.62)
Friendly	0.0129***	0.0092*	0.0158***
	(3.43)	(1.76)	(3.23)
Defensive	0.0441***	0.0406***	0.0432***
	(14.99)	(9.88)	(10.45)
Acquirer top advisor	-0.0097***	-0.0129***	-0.0085**
	(-2.91)	(-2.91)	(-2.05)
Target top advisor	-0.0025	-0.0061***	0.0004
	(-1.37)	(-2.59)	(0.15)
Observations	18,833	9,801	8,717
Year and Industry dummies	Yes	Yes	Yes
R-squared	0.2864	0.2796	0.3236

Panel B - Earnout vs non-earnout

	Pr(Completed)	
	Earnout deals	Non-earnout deals
VARIABLES	(1)	(2)
CAR [-2;+2]	-0.0182	0.0215***
	(-0.88)	(2.91)
Observations	1,259	16,574
Year and Industry dummies	Yes	Yes
Control Variables	Yes	Yes
Pseudo R-squared	0.2131	0.2956

Table 3.4 – Completion Time

This table reports coeffient estimates from linear regression (OLS) on the time to complete a deal. The dependent variable is the natural logarithm of one plus the time to completion (given as the difference between the announcement date and the completion date). In Panel B control variables are the same as in Panle A and omitted for brevity. All variables are defined in Appendix 3.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A - Full sample e CAR sign

VARIABLES	Ln(1+time to completion)		
	Full sample	CAR>0	CAR<0
	(1)	(2)	(3)
Earnout	-0.3800***	-0.3659***	-0.4069***
	(-9.28)	(-6.63)	(-6.65)
CAR [-2;+2]	0.1237	0.0574	0.5050
	(0.93)	(0.27)	(1.60)
Relative value	0.2361***	0.2382***	0.2371***
	(30.34)	(22.17)	(19.91)
Cash	0.0245	0.0590	-0.0245
	(0.77)	(1.35)	(-0.52)
Acq. Termination fee	0.3417***	0.3768***	0.2997***
	(6.70)	(4.95)	(4.32)
Targ. Termination fee	1.2048***	1.2202***	1.1984***
	(32.68)	(23.14)	(22.79)
Cross-border	0.1760***	0.1517***	0.2019***
	(5.06)	(3.25)	(3.86)
Toehold	-0.1620***	-0.1927***	-0.1273***
	(-5.62)	(-5.00)	(-2.91)
Cross Industry	0.2976**	0.3493*	0.2558
	(2.38)	(1.79)	(1.55)
Multiple bidders	0.3352***	0.5413***	0.1017

Table 3.4 – Completion Time (Cont'd)

	(3.13)	(3.63)	(0.66)
Tender offer	0.3908***	0.4137***	0.3582***
	(6.77)	(4.87)	(4.49)
Friendly	-0.1761	-0.2655	-0.0997
	(-1.42)	(-1.56)	(-0.55)
Defensive	0.2450***	0.2458*	0.2221*
	(2.81)	(1.85)	(1.90)
Acquirer top advisor	0.8500***	0.8497***	0.8433***
	(27.15)	(19.78)	(18.19)
Target top advisor	0.8241***	0.8356***	0.8134***
	(26.06)	(19.35)	(17.28)
Constant	3.1620***	2.8959***	3.8968***
	(8.64)	(6.48)	(6.55)
Observations	18,398	10,212	8,186
Year and Industry dummies	Yes	Yes	Yes
R-squared	0.278	0.264	0.304

Panel B - Earnout vs non-earnout

	Ln(1+time to completion)	
	Earnout deals	Non-earnout deals
VARIABLES	(1)	(2)
CAR [-2;+2]	-0.0939	0.1517
	(-0.26)	(1.07)
Observations	2,228	16,170
Year and Industry dummies	Yes	Yes
Control Variables	Yes	Yes
R-squared	0.205	0.284

Table 3.5 – Probability of Not Listening

This table reports coefficient estimates from logit regression on the probability to ignore the market. The dependent variable is Ignore the Market, a binary variable that takes the value of one if the CAR is higher (lower) than 2.5% (-2.5%) and the deal is withdrawn (completed), and zero if completed (withdrawn). All variables are defined in Appendix 3.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively.

	Ignore the market			
	Full Sample	CAR<0	Full Sample	CAR<0
VARIABLES	(1)	(2)	(3)	(4)
Earnout	0.0160	0.0410***	0.0457***	0.0192**
	(1.13)	(3.22)	(3.17)	(1.97)
Relative value			-0.0199***	-0.0133***
			(-7.37)	(-8.64)
Cash			-0.0403***	0.0150**
			(-3.74)	(2.45)
Acq. Termination fee			0.0578**	0.0039
			(2.37)	(0.39)
Targ. Termination fee			0.0361	0.0494***
			(1.64)	(4.95)
Cross Industry			0.0262**	-0.0046
			(2.54)	(-0.81)
Multiple bidders			-0.0081	-0.1085***
			(-0.20)	(-8.36)
Public target			0.1071***	-0.0506***
			(5.59)	(-6.20)
Toehold			-0.0084	-0.0099
			(-0.24)	(-0.66)
Tender offer			-0.0246	0.0484***
			(-0.88)	(3.46)

Table 3.5 – Probability of Not Listening (Cont'd)

Friendly			-0.0304	0.0691***
			(-0.88)	(6.43)
Defensive			0.0062	-0.0227*
			(0.16)	(-1.87)
Observations	11,855	5,019	11,854	5,019
Year and Industry dummies	Yes	Yes	Yes	Yes
Pseudo R-squared	0.00950	0.0390	0.0207	0.200

Table 3.6 – Probability of Not Listening and Institutional Ownership

This table reports coefficient estimates from logit regression on the probability to ignore the market. The dependent variable is Ignore the Market, a binary variable that takes the value of one if the CAR is higher (lower) than 2.5% (-2.5%) and the deal is withdrawn (completed), and zero if completed (withdrawn). Other control variables are the same as in Table 3.5 and omitted for brevity All variables are defined in Appendix 3.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively.

	Ignore the market	
VARIABLES	(1)	(2)
Earnout	0.0463***	0.0377**
	(2.93)	(2.24)
Strategic ownership	-0.0019	
	(-0.17)	
Active ownership		0.0123
		(1.07)
Observations	9,171	8,075
Control Variables	Yes	Yes
Year and Industry dummies	Yes	Yes
Pseudo R-squared	0.0240	0.0238

Table 3.7 – Probability to drop earnout

This table reports coefficient estimates from logit regression on the probability to abandon the inclusion of an earnout. The dependent variable is Drop Earnout, a binary variable that takes the value of one if the deal was proposed with earnout but completed without earnout, and zero if proposed and completed with earnout All variables are defined in Appendix 3.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively.

	Pr(Drop Earnout)	
	Full sample	CAR<0
VARIABLES	(1)	(2)
CAR [-2;+2]	-0.0039	0.0135
	(-0.13)	(0.11)
Cross-border	0.0212***	0.0414***
	(3.11)	(2.85)
Cross Industry	-0.0162**	-0.0330**
	(-2.07)	(-2.14)
Relative value	0.0015	0.0075
	(0.88)	(1.61)
Leverage $_{t-1}$	-0.0160	-0.0406
	(-0.76)	(-0.77)
MTB $_{t-1}$	0.0008**	0.0010
	(2.31)	(1.10)
Toehold	0.0108	0.0075
	(0.58)	(0.22)
Public Target	0.0594***	0.0656**
	(4.02)	(2.05)
Analysts Following $_{t-1}$	0.0065	0.0141
	(1.14)	(1.11)
Observations	2,072	611
Year and Industry dummies	Yes	Yes
Pseudo R-squared	0.109	0.173

Table 3.8 – Robustness tests: CEM approach

This table reports coefficient estimates from logit regression on the probability to complete a deal (Panel A) and the probability of ignoring the market (Panel B). In Panel A the dependent variable is Completed, a binary variable that takes the value of one if the deal is ultimately completed and zero if it is withdrawn (panel A) and in Panel B is Ignore the Market, a binary variable that takes the value of one if the CAR is higher (lower) than 2.5% (-2.5%) and the deal is withdrawn (completed), and zero if completed (withdrawn). In Panel A and Panel B the control variables are the same as in Table 3.4 and Table 3.5, respectively, and omitted for brevity. All variables are defined in Appendix 3.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A - Completion probability

	Pr(Completed)	
	Full sample	CAR<0
VARIABLES	(1)	(2)
CAR [-2;+2]	0.0231***	0.0361***
	(3.49)	(3.11)
Earnout	0.0039*	0.0097***
	(1.70)	(2.90)
Observations	14,836	6,970
Control Variables	Yes	Yes
Year and Industry dummies	Yes	Yes
Pseudo R-squared	0.3179	0.3433

Table 3.8 – Robustness tests: CEM approach (cont'd)

Panel B - Probability of ignoring

	Full sample	CAR<0
VARIABLES	(1)	(2)
Earnout	0.0321**	0.0252**
	(2.07)	(2.55)
Observations	10,115	4,030
Control Variables	Yes	Yes
Year and Industry dummies	Yes	Yes
Pseudo R-squared	0.0205	0.195

Table 3.9 – Exclusion of same-day deals

This table reports coefficient estimates from logit regression on the probability to complete a deal (Panel A) and the probability of ignoring the market (Panel B), for the subsample of deals not announced and completed in the same day. In Panel A the dependent variable is Completed, a binary variable that takes the value of one if the deal is ultimately completed and zero if it is withdrawn (panel A) and in Panel B is Ignore the Market, a binary variable that takes the value of one if the CAR is higher (lower) than 2.5% (-2.5%) and the deal is withdrawn (completed), and zero if completed (withdrawn). In Panel A and Panel B the control variables are the same as in Table 3.4 and Table 3.5, respectively, and omitted for brevity. All variables are defined in Appendix 3.A. All continuous variables are winsorized at the top and bottom 1% of the distribution. Robust t-statistics are reported in parentheses. ***, ** and * mean statistical significance at the 1%, 5%, and 10% level, respectively.

Panel A - Completion probability

	Pr(Completed)	
VARIABLES	Full sample	CAR<0
	(1)	(2)
CAR [-2;+2]	0.0393***	0.0908***
	(3.05)	(4.13)
Earnout	0.0086*	0.0182**
	(1.72)	(2.30)
Observations	12,052	5,565
Control Variables	Yes	Yes
Year and Industry dummies	Yes	Yes
Pseudo R-squared	0.2604	0.2936

Table 3.9 – Exclusion of same-day deals (cont'd)

Panel B - Probability of not listening

VARIABLES	Ignore the market	
	Full sample	CAR<0
	(1)	(2)
Earnout	0.0410**	0.0234*
	(2.12)	-1.87
Observations	7,701	3,215
Control Variables	Yes	Yes
Year and Industry dummies	Yes	Yes
Pseudo R-squared	0.0251	0.212

CONCLUSION

This thesis offers a comprehensive examination of earnouts in mergers and acquisitions, addressing their role as transactional tools for mitigating valuation uncertainty and a mechanism that shapes post-deal behavior and managerial decision-making. While the existing literature has largely emphasized the economic rationale behind earnouts – particularly their usefulness in bridging information gaps between acquirers and targets – this thesis moves beyond the standard framing. It explores how earnouts influence incentives, behaviors, and governance outcomes throughout the deal lifecycle.

Across three chapters, we provide robust empirical evidence from large samples of U.S. M&A transactions to demonstrate that earnouts, although designed to facilitate deal execution, also introduce unintended consequences that merit careful scrutiny.

The first chapter highlights how the structure of earnouts can distort managerial incentives after a deal closes. We show that acquirers using earnouts engage in downward earnings management – primarily through real activities manipulation – during the earnout period, likely to reduce contingent payments to target shareholders. This behavior is particularly pronounced in deals where the upfront or total payment is made in cash and is significantly mitigated when sellers receive equity, which increases their post-deal monitoring power. These results bring new insight into post-acquisition conduct, revealing that earnouts, while bridging valuation gaps, may also create agency problems that undermine contractual fairness.

The second chapter examines the pre-deal motivations driving the choice to use earnouts, focusing on the role of CEO compensation structures. We find that CEOs with higher delta – i.e., those whose wealth is more sensitive to firm value – are significantly less likely to include earnouts in deals, particularly when acquiring difficult-to-value targets such as private or intangible-rich firms. Similarly, higher vega is associated with a reduced likelihood of using earnouts in lower-uncertainty transactions. These findings underscore that managerial preferences for deal structures are shaped not only by the characteristics of the deal but also by the personal financial incentives of decision-makers. This chapter adds a novel perspective to the literature on acquisition structuring by identifying executive compensation as a key determinant of the use of contingent payment mechanisms.

The third chapter explores the relation between the use of earnouts and how managers respond to capital market feedback. While earnouts increase the probability and speed of deal completion, we also find that their inclusion weakens the link between market reactions and managerial decisions. Specifically, acquirers that structure deals with earnouts are less likely to withdraw or revise transactions following negative announcement returns. This muted responsiveness is evident in the subsample of deals with unfavorable cumulative abnormal returns. This suggests that earnouts may insulate managers from

external discipline and diminish their capacity – or willingness – to incorporate informative market signals. Additional tests confirm that even when the market reacts poorly, managers rarely renegotiate or remove earnout clauses, reinforcing the interpretation that earnouts introduce a rigidity that constrains adaptive behavior.

Taken together, the findings from this thesis contribute to the literature on M&A, contract theory, and corporate governance by revealing a dual character of earnouts. On the one hand, they are practical tools for deal facilitation – helping firms close transactions that might otherwise fail due to valuation frictions. On the other hand, they can generate moral hazard problems after the deal, bias managerial incentives, and reduce sensitivity to market-based signals. This dual role is a central theme across the three chapters and offers a more nuanced understanding of the tradeoffs involved in using contingent payments in acquisitions.

The policy implications of this research are both timely and significant. While earnouts offer important advantages in facilitating M&A transactions, such as bridging valuation gaps and enabling deal completion under uncertainty, they also present critical governance challenges that must not be overlooked. Specifically, the design and implementation of earnout clauses require heightened scrutiny from boards of directors, institutional investors, and regulators. Beyond their transactional utility, earnouts can inadvertently undermine key accountability mechanisms. By enabling post-deal reporting manipulation, especially in cash-based deals, distorting managerial incentives, and weakening the disciplining effect of market signals, earnouts may reduce the effectiveness of external oversight and erode shareholder value.

Therefore, stakeholders approving or monitoring M&A activity should adopt a more proactive stance toward deals involving contingent payments. This includes ensuring transparency in the performance metrics tied to earnout payments, requiring detailed disclosure of earnout terms and associated managerial incentives, and critically evaluating the justification provided by executives for using earnouts, particularly in deals that observe adverse market reactions when they are announced. Additionally, strengthening post-deal monitoring mechanisms, such as enhanced audit scrutiny, clearer performance thresholds, third-party arbitration clauses, or staggered payout structures, may be necessary to deter opportunistic earnings management and align managerial behavior with long-term firm objectives.

In short, rather than assuming that earnouts inherently align interests between bidders and targets, policymakers and governance actors should recognize that these instruments introduce new agency risks. By combining contractual flexibility with adequate monitoring and disclosure standards, firms and regulators can better preserve the strategic benefits of earnouts while safeguarding shareholder interests and market integrity.

By systematically exploring the intersection between earnout contracts, managerial incentives, and market discipline, this thesis advances theoretical and empirical understandings of how contractual mechanisms influence M&A outcomes. In doing so, it offers relevant insights for practitioners, scholars, and policymakers seeking to navigate the complexities of M&A deal-making.

REFERENCES

Abdallah, A. A. L. N., & Abdallah, W. (2017). Does cross-listing increase managers' propensity to listen to the market in M&A deals? *Journal of Corporate Finance*, *46*, 97–120. https://doi.org/10.1016/j.jcorpfin.2017.06.016

Aharony, J., Wang, J. W., & Yuan, H. Q. (2010). Tunneling as an incentive for earnings management during the IPO process in China. *Journal of Accounting and Public Policy*, *29*(1), 1–26. https://doi.org/10.1016/j.jaccpubpol.2009.10.003

Albuquerque, A., Carter, M. E., Guo, Z., & Lynch, L. J. (2024). Complexity of CEO compensation packages. *Journal of Accounting and Economics*, 101709. https://doi.org/10.1016/j.jacceco.2024.101709

Alexakis, D., & Barbopoulos, L. G. (2019). Incentive-compatible contracts in merger negotiations: The role of acquirer idiosyncratic stock return volatility. *Financial Markets, Institutions & Instruments*, *29*(1), 3–40. https://doi.org/10.1111/fmii.12124

Alexandridis, G., Chen, Z., & Zeng, Y. Q. (2021). Financial hedging and corporate investment. *Journal of Corporate Finance*, *67*, 101887. https://doi.org/10.1016/j.jcorpfin.2021.101887

Alhadab, M., Clacher, I., & Keasey, K. (2015). Real and accrual earnings management and IPO failure risk. *Accounting and Business Research*, *45*(1), 55–92. https://doi.org/10.1080/00014788.2014.969187

Allee, K. D., & Wangerin, D. D. (2018). Auditor monitoring and verification in financial contracts: evidence from earnouts and SFAS 141(R). *Review of Accounting Studies*, *23*(4), 1629–1664. https://doi.org/10.1007/s11142-018-9472-0

Armstrong, C. S., & Vashishtha, R. (2012). Executive stock options, differential risk-taking incentives, and firm value. *Journal of Financial Economics*, *104*(1), 70–88. https://doi.org/10.1016/j.jfineco.2011.11.005

Bakke, T. E., Mahmudi, H., Fernando, C. S., & Salas, J. M. (2016). The causal effect of option pay on corporate risk management. *Journal of Financial Economics*, *120*(3), 623–643. https://doi.org/10.1016/j.jfineco.2016.02.007

Banerjee, S., Huang, S. Y., Nanda, V., & Xiao, S. C. (2023). Managerial Overconfidence and Market Feedback Effects. *Management Science*, *69*(12), 7285–7305. https://doi.org/10.1287/mnsc.2022.4625

Barbopoulos, L., & Sudarsanam, S. (2012). Determinants of earnout as acquisition payment currency and bidder's value gains. *Journal of Banking & Finance*, *36*(3), 678–694. https://doi.org/10.1016/j.jbankfin.2011.10.007

Barbopoulos, L. G., & Adra, S. (2016). The earnout structure matters: Takeover premia and acquirer gains in earnout financed M&As. *International Review of Financial Analysis*, *45*, 283–294. https://doi.org/10.1016/j.irfa.2016.04.007

Barbopoulos, L. G., & Danbolt, J. (2021). The real effects of earnout contracts in M&As. *Journal of Financial Research*, *44*(3), 607–639. https://doi.org/10.1111/jfir.12256

Barbopoulos, L. G., Paudyal, K., & Sudarsanam, S. (2017). Earnout deals: method of initial payment and acquirers' gain. *European Financial Management*, 1–43.

Bates, T. W., & Lemmon, M. L. (2003). Breaking up is hard to do? An analysis of termination fee provisions and merger outcomes. *Journal of Financial Economics*, *69*(3), 469–504. https://doi.org/10.1016/s0304-405x(03)00120-x

Bates, T. W., Neyland, J. B., & Wang, Y. Y. (2018). Financing acquisitions with earnouts. *Journal of Accounting and Economics*, *66*(2-3), 374–395. https://doi.org/10.1016/j.jacceco.2018.08.002

Bebchuk, L. A., Coates, J., & Subramanian, G. (2002). The powerful antitakeover force of staggered boards: theory, evidence and policy. In: National Bureau of Economic Research Cambridge, Mass., USA.

Becher, D., Jensen, T. K., & Liu, T. T. (2020). Acquisitions and funding conditions. *Journal of Corporate Finance*, *65*, 101760. https://doi.org/10.1016/j.jcorpfin.2020.101760

Bergstresser, D., & Philippon, T. (2006). CEO incentives and earnings management. *Journal of Financial Economics*, *80*(3), 511–529. https://doi.org/10.1016/j.jfineco.2004.10.011

Betton, S., Eckbo, B. E., & Thorburn, K. S. (2009). Merger negotiations and the toehold puzzle. *Journal of Financial Economics*, *91*(2), 158–178. https://doi.org/10.1016/j.jfineco.2008.02.004

Blackwell, M., Iacus, S., King, G., & Porro, G. (2009). Cem: Coarsened Exact Matching in Stata. *The Stata Journal*, *9*(4), 524–546. https://doi.org/10.1177/1536867x0900900402

Bonacchi, M., Cipollini, F., & Zarowin, P. (2018). Parents' Use of Subsidiaries to "Push Down" Earnings Management: Evidence from Italy. *Contemporary accounting research*, *35*(3), 1332–1362. https://doi.org/10.1111/1911-3846.12330

Boone, A. L., & Mulherin, J. H. (2007). How Are Firms Sold? *The Journal of Finance*, *62*(2), 847–875. https://doi.org/10.1111/j.1540-6261.2007.01225.x

Botsari, A., & Meeks, G. (2008). Do Acquirers Manage Earnings Prior to a Share for Share Bid? *Journal of Business Finance &Accounting*, *35*(5-6), 633–670. https://doi.org/10.1111/j.1468-5957.2008.02091.x

Boulton, T. J., Braga-Alves, M. V., & Schlingemann, F. P. (2014). Does Equity-Based Compensation Make Ceos More Acquisitive? *Journal of Financial Research*, *37*(3), 267–294. https://doi.org/10.1111/jfir.12037

Boyallian, P., & Ruiz-Verdú, P. (2018). Leverage, CEO Risk-Taking Incentives, and Bank Failure during the 2007–10 Financial Crisis*. *Review of Finance*, *22*(5), 1763–1805. https://doi.org/10.1093/rof/rfx051

Brick, I. E., Palmon, O., & Wald, J. K. (2012). Too Much Pay-Performance Sensitivity? [Article]. *Review of Economics and Statistics*, *94*(1), 287–303. https://doi.org/10.1162/REST_a_00142

Bruner, R. F., & Perella, J. R. (2004). *Applied mergers and acquisitions* (Vol. 173). John Wiley & Sons.

Bushee, B. J. (1998). The Influence of Institutional Investors on Myopic R&D Investment Behavior. *The Accounting Review*, *73*(3), 305–333. http://www.jstor.org/stable/248542

Cadman, B., Carrizosa, R., & Faurel, L. (2014). Economic Determinants and Information Environment Effects of Earnouts: New Insights from SFAS 141(R). *Journal of accounting research*, *52*(1), 37–74. https://doi.org/10.1111/1475-679X.12036

Cain, M. D., Denis, D. J., & Denis, D. K. (2011). Earnouts: A study of financial contracting in acquisition agreements. *Journal of Accounting and Economics*, *51*(1-2), 151–170. https://doi.org/10.1016/j.jacceco.2010.05.001

Carpenter, J. N. (2002). Does Option Compensation Increase Managerial Risk Appetite? *The Journal of Finance*, *55*(5), 2311–2331. https://doi.org/10.1111/0022-1082.00288

Chava, S., & Purnanandam, A. (2010). CEOs versus CFOs: Incentives and corporate policies. *Journal of Financial Economics*, *97*(2), 263–278. https://doi.org/10.1016/j.jfineco.2010.03.018

Chen, C. R., Steiner, T. L., & Whyte, A. M. (2006). Does stock option-based executive compensation induce risk-taking? An analysis of the banking industry. *Journal of Banking & Finance*, *30*(3), 915–945. https://doi.org/10.1016/j.jbankfin.2005.06.004

Cohen, D. A., Dey, A., & Lys, T. Z. (2008). Real and accrual-based earnings management in the pre- and post-Sarbanes-Oxley periods. *Accounting review*, *83*(3), 757–787. https://doi.org/10.2308/accr.2008.83.3.757

Cohen, D. A., & Zarowin, P. (2010). Accrual-based and real earnings management activities around seasoned equity offerings. *Journal of Accounting & Economics*, *50*(1), 2–19. https://doi.org/10.1016/j.jacceco.2010.01.002

Cohen, S., Kadach, I., Ormazabal, G., & Reichelstein, S. (2023). Executive Compensation Tied to ESG Performance: International Evidence. *Journal of accounting research*, *61*(3), 805–853. https://doi.org/10.1111/1475-679x.12481

Coles, J. L., Daniel, N. D., & Naveen, L. (2006). Managerial incentives and risk-taking. *Journal of Financial Economics*, *79*(2), 431–468. https://doi.org/10.1016/j.jfineco.2004.09.004

Core, J., & Guay, W. (2002). Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility. *Journal of accounting research*, *40*(3), 613–630. https://doi.org/10.1111/1475-679x.00064

Cremers, K. J. M., & Nair, V. B. (2005). Governance Mechanisms and Equity Prices. *The Journal of Finance*, *60*(6), 2859–2894. https://doi.org/10.1111/j.1540-6261.2005.00819.x

Croci, E., & Petmezas, D. (2015). Do risk-taking incentives induce CEOs to invest? Evidence from acquisitions. *Journal of Corporate Finance*, *32*, 1–23. https://doi.org/10.1016/j.jcorpfin.2015.03.001

Datar, S., Frankel, R., & Wolfson, M. (2001). Earnouts: The effects of adverse selection and agency costs on acquisition techniques. *Journal of Law, Economics, and Organization*, *17*(1), 201–238.

Datta, S., Iskandar-Datta, M., & Raman, K. (2002). Executive Compensation and Corporate Acquisition Decisions. *The Journal of Finance*, *56*(6), 2299–2336. https://doi.org/10.1111/0022-1082.00406

Dechow, P. M., Sloan, R. G., & Sweeney, A. P. (1995). Detecting Earnings Management. *Accounting review*, *70*(2), 193–225. <Go to ISI>://WOS:A1995QT71600001

Devos, E., Elliott, W. B., & Warr, R. S. (2018). The Propensity to Split and CEO Compensation. *Financial Management*, *47*(1), 105–129. https://doi.org/10.1111/fima.12179

Dikova, D., Sahib, P. R., & van Witteloostuijn, A. (2010). Cross-border acquisition abandonment and completion: The effect of institutional differences and organizational learning in the international business service industry, 1981-2001. *Journal of International Business Studies*, *41*(2), 223–245. https://doi.org/10.1057/jibs.2009.10

Eckbo, B. E. (2009). Bidding strategies and takeover premiums: A review. *Journal of Corporate Finance*, *15*(1), 149–178. https://doi.org/10.1016/j.jcorpfin.2008.09.016

Edmans, A., & Gabaix, X. (2016). Executive Compensation: A Modern Primer. *Journal of Economic Literature*, *54*(4), 1232–1287. https://doi.org/10.1257/jel.20161153

Edmans, A., Heinle, M. S., & Huang, C. (2013). The real costs of disclosure. *NBER working paper*(w19420).

Edmans, A., Jayaraman, S., & Schneemeier, J. (2017). The source of information in prices and investment-price sensitivity. *Journal of Financial Economics*, *126*(1), 74–96. https://doi.org/10.1016/j.jfineco.2017.06.017

Eisdorfer, A., Giaccotto, C., & White, R. (2013). Capital structure, executive compensation, and investment efficiency. *Journal of Banking & Finance*, *37*(2), 549–562. https://doi.org/10.1016/j.jbankfin.2012.09.011

Elnahas, A. M., Hassan, M. K., & Ismail, G. M. (2017). Religion and mergers and acquisitions contracting: The case of earnout agreements. *Journal of Corporate Finance*, *42*, 221–246. https://doi.org/10.1016/j.jcorpfin.2016.11.012

Erel, I., Liao, R. C., & Weisbach, M. S. (2012). Determinants of Cross-Border Mergers and Acquisitions. *The Journal of Finance*, *67*(3), 1045–1082. https://doi.org/10.1111/j.1540-6261.2012.01741.x

Erickson, M., & Wang, S. W. (1999). Earnings management by acquiring firms in stock for stock mergers. *Journal of Accounting & Economics*, *27*(2), 149–176. https://doi.org/10.1016/S0165-4101(99)00008-7

Ewelt-Knauer, C., Gefken, J., Knauer, T., & Wiedemann, D. (2018). Acquirers' Cultural Background and the Use of Earnouts. *Journal of Accounting, Auditing & Finance*, *36*(1), 30–55. https://doi.org/10.1177/0148558x18787118

Faccio, M., McConnell, J. J., & Stolin, D. (2006). Returns to Acquirers of Listed and Unlisted Targets. *Journal of Financial and Quantitative Analysis*, *41*(1), 197–220. https://doi.org/10.1017/S0022109000002477

Ferreira, M. A., & Matos, P. (2008). The colors of investors' money: The role of institutional investors around the world. *Journal of Financial Economics*, *88*(3), 499–533. https://doi.org/10.1016/j.jfineco.2007.07.003

Frankel, M. E. S. (2005). Save that deal using Earn-outs. *Journal of Corporate Accounting & Finance*, *16*(2), 21–25. https://doi.org/10.1002/jcaf.20084

Fuller, K., Netter, J., & Stegemoller, M. (2002). What Do Returns to Acquiring Firms Tell Us? Evidence from Firms That Make Many Acquisitions. *The Journal of Finance*, *57*(4), 1763–1793. https://doi.org/10.1111/1540-6261.00477

García Lara, J. M., García Osma, B., & Penalva, F. (2020). Conditional conservatism and the limits to earnings management. *Journal of Accounting and Public Policy*, *39*(4), 106738. https://doi.org/10.1016/j.jaccpubpol.2020.106738

Gogineni, S., & Puthenpurackal, J. (2014). Target-Management-Involved Buyouts: Impact on Takeover Competition, Litigation Risk, and Shareholder Returns. *Journal of Financial Research*, *37*(3), 323–356. https://doi.org/10.1111/jfir.12039

Golubov, A., Petmezas, D., & Travlos, N. G. (2012). When It Pays to Pay Your Investment Banker: New Evidence on the Role of Financial Advisors in M&As. *The Journal of Finance*, *67*(1), 271–311. https://doi.org/10.1111/j.1540-6261.2011.01712.x

Gong, G. J., Louis, H., & Sun, A. X. (2008). Earnings management, lawsuits, and stock-for-stock acquirers' market performance. *Journal of Accounting & Economics*, *46*(1), 62–77. https://doi.org/10.1016/j.jacceco.2008.03.001

Gormley, T. A., Matsa, D. A., & Milbourn, T. (2013). CEO compensation and corporate risk: Evidence from a natural experiment. *Journal of Accounting & Economics*, *56*(2-3), 79–101. https://doi.org/10.1016/j.jacceco.2013.08.001

Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting & Economics*, *40*(1-3), 3–73. https://doi.org/10.1016/j.jacceco.2005.01.002

Grinstein, Y., & Hribar, P. (2004). CEO compensation and incentives: Evidence from M&A bonuses. *Journal of Financial Economics*, *73*(1), 119–143. https://doi.org/10.1016/j.jfineco.2003.06.002

Guay, W. R. (1999). The sensitivity of CEO wealth to equity risk: an analysis of the magnitude and determinants. *Journal of Financial Economics*, *53*(1), 43–71. https://doi.org/10.1016/S0304-405x(99)00016-1

Guo, L., Jalal, A., & Khaksari, S. (2015). Bank executive compensation structure, risk taking and the financial crisis. *Review of Quantitative Finance and Accounting*, *45*(3), 609–639. https://doi.org/10.1007/s11156-014-0449-1

Hagendorff, J., & Vallascas, F. (2011). CEO pay incentives and risk-taking: Evidence from bank acquisitions. *Journal of Corporate Finance*, *17*(4), 1078–1095. https://doi.org/10.1016/j.jcorpfin.2011.04.009

Harford, J., Humphery-Jenner, M., & Powell, R. (2012). The sources of value destruction in acquisitions by entrenched managers. *Journal of Financial Economics*, *106*(2), 247–261. https://doi.org/10.1016/j.jfineco.2012.05.016

Harris, O., Karl, J. B., & Lawrence, E. (2019). CEO compensation and earnings management: Does gender really matters? *Journal of business research*, *98*, 1–14. https://doi.org/10.1016/j.jbusres.2019.01.013

Haugen, R. A., & Senbet, L. W. (1981). Resolving the Agency Problems of External Capital through Options. *Journal of Finance*, *36*(3), 629–647. https://doi.org/10.2307/2327523

Hayes, R. M., Lemmon, M., & Qiu, M. M. (2012). Stock options and managerial incentives for risk taking: Evidence from FAS 123R. *Journal of Financial Economics*, *105*(1), 174–190. https://doi.org/10.1016/j.jfineco.2012.01.004

Heckman, J. J. (1979). Sample Selection Bias as a Specification Error. *Econometrica*, *47*(1), 153–161. https://doi.org/10.2307/1912352

Hillier, D., McColgan, P., & Tsekeris, A. (2020). Value creation around merger waves: The role of managerial compensation. *Journal of Business Finance & Accounting*, *47*(1-2), 132–162. https://doi.org/10.1111/jbfa.12419

Hirshleifer, D., Low, A., & Teoh, S. H. (2012). Are Overconfident CEOs Better Innovators? *The Journal of Finance*, *67*(4), 1457–1498. https://doi.org/10.1111/j.1540-6261.2012.01753.x

Hirshleifer, D., & Thakor, A. V. (1992). Managerial Conservatism, Project Choice, and Debt. *Review of Financial Studies*, *5*(3), 437–470. https://doi.org/10.1093/rfs/5.3.437

Holmström, B. (1999). Managerial Incentive Problems: A Dynamic Perspective. *The Review of Economic Studies*, *66*(1), 169–182. http://www.jstor.org/stable/2566954

Horrace, W. C., & Oaxaca, R. L. (2006). Results on the bias and inconsistency of ordinary least squares for the linear probability model. *Economics Letters*, *90*(3), 321–327. https://doi.org/10.1016/j.econlet.2005.08.024

Huang, C., & Li, Z. (2024). The role of Cross-Border alliances in corporate social responsibility: International evidence. *Journal of Financial Research*, *47*(3), 823–875. https://doi.org/10.1111/jfir.12385

Iacus, S. M., King, G., & Porro, G. (2012). Causal Inference without Balance Checking: Coarsened Exact Matching. *Political Analysis*, *20*(1), 1–24. https://doi.org/10.1093/pan/mpr013

Jensen, M. C., & Murphy, K. J. (1990). Performance Pay and Top-Management Incentives. *Journal of Political Economy*, *98*(2), 225–264. http://www.jstor.org/stable/2937665

John, K., Litov, L., & Yeung, B. (2008). Corporate Governance and Risk-Taking. *The Journal of Finance*, *63*(4), 1679–1728. http://www.jstor.org/stable/25094487

Kang, S. H., Kumar, P., & Lee, H. (2006). Agency and corporate investment: The role of executive compensation and corporate governance. *Journal of Business*, *79*(3), 1127–1147. https://doi.org/10.1086/500671

Kau, J. B., Linck, J. S., & Rubin, P. H. (2008). Do managers listen to the market? *Journal of Corporate Finance*, *14*(4), 347–362. https://doi.org/10.1016/j.jcorpfin.2008.03.002

Kepler, J. D., Naiker, V. I. C., & Stewart, C. R. (2023). Stealth Acquisitions and Product Market Competition. *The Journal of Finance*, *n/a*(n/a). https://doi.org/10.1111/jofi.13256

Kohers, N., & Ang, J. (2000). Earnouts in mergers: Agreeing to disagree and agreeing to stay. *The Journal of Business*, *73*(3), 445–476.

Lawrence, E. R., Raithatha, M., & Rodriguez, I. (2021). The effect of cultural and institutional factors on initiation, completion, and duration of cross-border acquisitions. *Journal of Corporate Finance*, *68*, 101950. https://doi.org/10.1016/j.jcorpfin.2021.101950

Lee, G., & Masulis, R. W. (2011). Do more reputable financial institutions reduce earnings management by IPO issuers? *Journal of Corporate Finance*, *17*(4), 982–1000. https://doi.org/10.1016/j.jcorpfin.2011.04.012

Lin, C., Officer, M. S., & Shen, B. (2018). Managerial Risk-Taking Incentives and Merger Decisions. *The Journal of Financial and Quantitative Analysis*, *53*(2), 643–680. https://www.jstor.org/stable/26591922

Louis, H. (2004). Earnings management and the market performance of acquiring firms. *Journal of Financial Economics*, *74*(1), 121–148. https://doi.org/http://dx.doi.org/10.1016/j.jfineco.2003.08.004

Loureiro, G., & Silva, S. (2021). The impact of securities regulation on the information environment around stock-financed acquisitions. *Journal of International Financial Markets Institutions & Money*, *73*, 101374. https://doi.org/10.1016/j.intfin.2021.101374

Lukas, E., Reuer, J. J., & Welling, A. (2012). Earnouts in mergers and acquisitions: A game-theoretic option pricing approach. *European Journal of Operational Research*, *223*(1), 256–263.

Luo, Y. (2005). Do Insiders Learn from Outsiders? Evidence from Mergers and Acquisitions. *The Journal of Finance*, *60*(4), 1951–1982. https://doi.org/10.1111/j.1540-6261.2005.00784.x

Mao, C. X., & Zhang, C. (2018). Managerial Risk-Taking Incentive and Firm Innovation: Evidence from FAS 123R. *Journal of Financial and Quantitative Analysis*, *53*(2), 867–898. https://doi.org/10.1017/S002210901700120x

Masulis, R. W., Reza, S. W., & Guo, R. (2023). The sources of value creation in acquisitions of intangible assets. *Journal of Banking & Finance*, *154*, 106879. https://doi.org/10.1016/j.jbankfin.2023.106879

Mayberry, M., Park, H. J., & Xu, T. (2021). Risk-Taking Incentives and Earnings Management: New Evidence. *Contemporary accounting research*, *38*(4), 2723–2757. https://doi.org/10.1111/1911-3846.12704

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics*, *73*(2), 201–228.

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2005). Wealth Destruction on a Massive Scale? A Study of Acquiring-Firm Returns in the Recent Merger Wave. *The Journal of Finance*, *60*(2), 757–782. https://doi.org/10.1111/j.1540-6261.2005.00745.x

Morck, R., Shleifer, A., & Vishny, R. W. (1988). Characteristics of targets of hostile and friendly takeovers. In *Corporate takeovers: Causes and consequences* (pp. 101–136). University of Chicago Press.

Officer, M. S. (2003). Termination fees in mergers and acquisitions. *Journal of Financial Economics*, *69*(3), 431–467. https://doi.org/10.1016/S0304-405x(03)00119-3

Officer, M. S., Poulsen, A. B., & Stegemoller, M. (2009). Target-firm information asymmetry and acquirer returns. *Review of Finance*, *13*(3), 467–493. https://doi.org/10.1093/rof/rfn017

Prencipe, A., & Viarengo, L. (2022). Should I Trust You? Bidder's Earnings Quality as an Indicator of Trustworthiness in Earnout Agreements. *The International Journal of Accounting*, *57*(01), 2250002. https://doi.org/10.1142/s1094406022500020

Ragozzino, R., & Reuer, J. J. (2009). Contingent earnouts in acquisitions of privately held targets. *Journal of Management*, *35*(4), 857–879.

Reuer, J. J., Shenkar, O., & Ragozzino, R. (2004). Mitigating risk in international mergers and acquisitions: the role of contingent payouts [journal article]. *Journal of International Business Studies*, *35*(1), 19–32. https://doi.org/10.1057/palgrave.jibs.8400053

Ross, S. A. (2004). Compensation, incentives, and the duality of risk aversion and riskiness. *Journal of Finance*, *59*(1), 207–225. https://doi.org/10.1111/j.1540-6261.2004.00631.x

Rossi, S., & Volpin, P. F. (2004). Cross-country determinants of mergers and acquisitions. *Journal of Financial Economics*, *74*(2), 277–304. https://doi.org/10.1016/j.jfineco.2003.10.001

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting & Economics*, *42*(3), 335–370. https://doi.org/10.1016/j.jacceco.2006.01.002

Sani, J., Shroff, N., & White, H. (2023). Spillover effects of mandatory portfolio disclosures on corporate investment. *Journal of Accounting & Economics*, *76*(2-3), 101641. https://doi.org/10.1016/j.jacceco.2023.101641

Schwert, G. W. (2002). Hostility in Takeovers: In the Eyes of the Beholder? *The Journal of Finance*, *55*(6), 2599–2640. https://doi.org/10.1111/0022-1082.00301

Shen, C. H. H., & Zhang, H. (2020). What's good for you is good for me: The effect of CEO inside debt on the cost of equity. *Journal of Corporate Finance*, *64*, 101699. https://doi.org/10.1016/j.jcorpfin.2020.101699

Shleifer, A., & Vishny, R. W. (1986). Large Shareholders and Corporate Control. *Journal of Political Economy*, *94*(3, Part 1), 461–488. https://doi.org/10.1086/261385

Shuto, A. (2009). Earnings Management to Exceed the Threshold: A Comparative Analysis of Consolidated and Parent-only Earnings. *Journal of International Financial Management & Accounting*, *20*(3), 199–239. https://doi.org/10.1111/j.1467-646X.2009.01031.x

Smith, C. W., & Stulz, R. M. (1985). The Determinants of Firms Hedging Policies. *Journal of Financial and Quantitative Analysis*, *20*(4), 391–405. https://doi.org/10.2307/2330757

Spolaore, A., & Le Moign, C. (2023). Market impacts of the 2020 short selling bans. *Journal of Financial Research*, *46*(S1), S29–S58. https://doi.org/10.1111/jfir.12355

Sunder, J., Sunder, S. V., & Zhang, J. J. (2017). Pilot CEOs and corporate innovation. *Journal of Financial Economics*, *123*(1), 209–224. https://doi.org/10.1016/j.jfineco.2016.11.002

Uhde, A. (2016). Risk-taking incentives through excess variable compensation: Evidence from European banks. *Quarterly Review of Economics and Finance*, *60*, 12–28. https://doi.org/10.1016/j.qref.2015.11.009

Vallascas, F., & Hagendorff, J. (2013). CEO Bonus Compensation and Bank Default Risk: Evidence from the U.S. and Europe. *Financial Markets, Institutions & Instruments*, *22*(2), 47–89. https://doi.org/10.1111/fmii.12004

Viarengo, L., Gatti, S., & Prencipe, A. (2018). Enforcement quality and the use of earnouts in M&A transactions: International evidence. *Journal of Business Finance & Accounting*, *45*(3-4), 437–481. https://doi.org/10.1111/jbfa.12314

Wong, P., & O'Sullivan, N. (2001). The determinants and consequences of abandoned takeovers. *Journal of Economic Surveys*, *15*(2), 145–186. https://doi.org/10.1111/1467-6419.00135

Zang, A. Y. (2012). Evidence on the Trade-Off between Real Activities Manipulation and Accrual-Based Earnings Management. *The Accounting Review*, *87*(2), 675–703. https://doi.org/10.2308/accr-10196

Zuo, L. (2016). The informational feedback effect of stock prices on management forecasts. *Journal of Accounting & Economics*, *61*(2-3), 391–413. https://doi.org/10.1016/j.jacceco.2016.03.001