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The Real Effects of Earnout Contracts in M&As[*]

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Abstract

Earnouts address merger valuation risk by deferring payment of a large part of deal consideration and making it contingent on targets' future performance. We find acquirers of unlisted targets using earnouts gain more (less) than those making full up-front payments in cash (stock). Larger and older acquirers benefit more from earnout-based deals, as do foreign acquirers and acquirers advised by top-tier or boutique advisors. We address identification through the PSM method and a quasi-natural experiment. Acquirers realize the highest returns from earnouts when the deferred payment is around 30% of deal value. Deferred payments are larger after the SFAS141(R) reform.

Keywords: Mergers and Acquisitions; Earnouts; Information Asymmetry; Financial Advisors; Risk-adjusted returns; SFAS141(R) reform.

JEL classifications: G12, G13, G14, G30, G34.

1. Introduction

Earnout is a contractual payment mechanism in Mergers and Acquisitions (M&As) where a relatively large part (often around a third) of the deal consideration is deferred and payable to the target's shareholders at multiple stages following the M&A announcement, contingent upon some observable measure(s) of the target firm's future performance within pre-specified periods (Cain et al., 2011; Barbopoulos et al., 2018a).[1] Earnouts are very popular among M&As of unlisted (i.e., private and subsidiary) target firms, particularly those operating in the hi-tech, healthcare, and other innovation- and patent-rich sectors, where valuation risk is generally high due to moral hazard and adverse selection (Kohers & Ang, 2000).[2] Prior studies show that earnouts are associated with higher acquirer gains, and also higher takeover premia, relative to counterpart M&As that are settled in single up-front payments at closing (Kohers & Ang, 2000; Barbopoulos & Adra, 2016). This is due to earnout helping to alleviate merger valuation risk through the reduction of adverse selection and moral hazard issues.

Earnouts affect thousands of firms and managers, and nowadays are used in sizeable investments involving the reallocation of assets worth billions of dollars. They are growing around the world, though the UK and US maintain their leading positions in terms of both absolute and relative earnout activities (Viarengo et al., 2018). The effectiveness of earnouts depends on their structure, which can be complex and highly sensitive to the valuation challenges of the target firm, and hence the calculations of the merger's expected payoff

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[1] Following an up-front payment in the form of cash, stock, or a mixture of both made at closing, one or more future payment(s) – commonly referred to as the earnout payment(s) – is payable (often over a period of 0.5 to 3 years), conditional on the target firm achieving pre-agreed (financial or operational) performance-related metrics. Financial metrics are typically revenue- or profit-based, e.g., revenues or EBITDA. Operational metrics are usually measured via milestones e.g., related to new product development. In the pharmaceutical sector, earnout payments are often conditional on the regulatory approval of a drug or the granting of a patent.

[2] In recent years, however, earnouts are increasingly used also in listed target M&As, yet their frequency remains low (<1% in our sample). While our analysis is based on unlisted target M&As, in a separate section we examine the valuation effects of earnouts in listed target M&As. We thank an anonymous reviewer for suggesting this analysis.

(Cain et al., 2011; Lukas et al., 2012; Battauz et al., 2021). As a result, earnout-design expertise and extensive negotiations are required to reach an agreement between the merging firms. Financial advisors are likely to possess the know-how to design "effective" earnout contracts (Bao & Edmans, 2011) and help the merging firms avoid "…convert[ing] today's disagreement over price into tomorrow's litigation over outcome" (Judge Laster, as quoted in Viarengo et al., 2018, p. 438). We are the first to address this important relation in the literature. We further study whether resourceful and experienced (larger and older) acquirers are more likely to better negotiate earnout terms, and to have an advantage in negotiations with relatively (mainly unlisted) small and valuation challenging targets. Moreover, the US regulatory framework under which earnouts operate (in M&As announced by US based acquirers) has undergone important reforms, particularly with the introduction of SFAS141(R) in 2009. The revised accounting standard requires acquirers to recognize the fair value of earnouts in the acquisition price as a liability in the company's accounts at the time of the acquisition, and to adjust earnout fair values each quarter (Cadman et al., 2014) (in Section 3.3 we offer a detailed discussion of this reform). We offer further evidence on these relations.

Given their growing popularity and the importance of earnouts in shaping the modern corporation, we set out to systematically examine the real effects of earnouts on acquirer returns.[3] Do investors react more favorably to earnout-based M&As of unlisted targets than counterpart deals settled in single up-front payments, and if so, when? What deal- and firm-specific characteristics contribute to the success of earnout-based M&As? What role do financial advisors play in the success of earnout-based M&As? Does the most basic aspect of the earnout structure – the size of the deferred part of the deal consideration – matter to returns? To what extent did the US policy reform (SFAS 141(R)) affect the use of earnout, its structure, and the stock market reaction to such deals? Finally, does the exclusion of listed

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[3] The business press has also pointed to the growing popularity of earnouts in unlocking COVID-19 valuation gaps. See Earnouts Are Rising Across Europe, But Can They Unlock COVID-19 Valuation Gaps? (Latham & Watkins LLP on September 21, 2020. Posted in M&A and Private Equity).

target M&As (given their limited earnout usage) affect the known valuation effects of earnouts on acquirer returns? These are questions of significant practical relevance to corporate managers, to which we provide comprehensive answers.

Arguably, the earnout payment mechanism encourages both ex-ante information sharing between the merging firms (thus reducing the risk of adverse selection, similar to stock financing in Hansen's (1987) model) and the retention of motivated and committed key personnel from the target firm during the integration phase of the merger (thus reducing moral hazard).[4] Put simply, target managers are motivated to remain in the firm and maximize its performance (to receive the deferred payments), especially if the managers are also the shareholders, which is often the case in unlisted companies (Barbopoulos & Sudarsanam, 2012). Therefore, earnouts are expected to reduce the underlying valuation gap between the merging firms by explicitly linking the target firm's payment in the acquisition to its future performance. This, in turn, is associated with an increased overall likelihood of merger success (and higher merger synergies), and, per our findings, higher acquirer gains relative to counterpart M&As without earnouts (consistent with, e.g., Kohers & Ang, 2000; Barbopoulos et al., 2018a, 2018b).[5] As a result, acquirers in earnout-based M&As are expected to gain more (less) than those in cash (stock) settled M&As without any (with strong and costless) contingent properties (Hansen, 1987; Chang, 1998; Kohers & Ang, 2000; Barbopoulos & Sudarsanam, 2012).

Our analysis is based on 31,214 M&As involving unlisted (i.e., private and subsidiary) target firms, made by either UK or US domiciled acquirers between 1986 and 2016. Our

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[4] Differences in opinion between buyers and sellers with regard to target value and expected merger synergies, if not managed and controlled effectively, may be detrimental to the merger payoff due to potential deal overpayment and failure to improve the resource allocation between the merging firms (Devos et al., 2009).

[5] We recognize that acquiring firms can use other means through which to provide incentives for target managers to share valuable information and remain with the acquirer in the integration phase of the deal, such as shares (Chang, 1998; Fuller et al., 2002). Our paper is not intended to analyze the relative merits of earnouts versus contractual solutions offered by other means.

preliminary univariate results show that acquirers in earnout-based M&As enjoy, on average, significant gains of 1.57 percentage points. M&As with earnouts outperform M&As settled fully in cash but underperform deals with stock and mixed single up-front payments. These findings hold regardless of the listing status of the target (i.e., private or subsidiary).[6] This suggests that earnout payments serve as another (in addition to stock) vehicle through which acquirers can reduce merger valuation risk by motivating both information sharing and the realization of high synergies from M&As of unlisted firms (Kohers & Ang, 2000). Importantly, our focus on M&As of unlisted target firms only in the study of the pricing effects of earnout versus non-earnout payments provides an ideal setting, as it avoids the negative pricing effects of stock-financed M&As of listed targets in the control group (Myers & Majluf, 1984; Travlos, 1987; Fuller et al., 2002).[7]

We further find that the age and size of the acquirer matters to earnout valuation effects: larger and more mature (and therefore more resourceful and possibly more experienced) acquirers are found to enjoy higher gains from earnout-based M&As relative to small and young acquirers, respectively. In addition, acquirers in smaller earnout-based deals relative to their size enjoy significant gains. Along these lines, we find that more resourceful acquirers, as proxied by their size or cash-to-assets ratio, are more likely to use more prestigious financial advisors. We find that the involvement of financial advisors matters to

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[6] While prior studies investigate the earnout effects on acquirers' gains by including listed target M&As, we offer the first analysis in which only M&As of unlisted targets are included, and we study whether the inclusion of listed target M&As can distort the analysis of earnout valuation effects.

[7] Recent evidence, however, challenges the traditional view that stock-swap listed target acquisitions are associated with a negative pricing effect on acquirer value. Alexandridis et al. (2017) find that stock-for-stock deals no longer destroy value, while Eckbo et al. (2018) argue that the more the target knows about the bidder, the less likely it is for the target to be paid with overpriced shares. De Bodt et al. (2019) further show that once a series of regulatory incentives are taken away (as they were starting in July 2001), the link between acquirer valuation and the choice to conduct a full stock-swap in an M&A deal is broken. Clearly and Hossain (2020) further show that the 3-year mean BHAR (Abnormal Operating Performance) increased significantly (at least at 5% level) by approximately 18.07% (1.34%) during the post-crisis period.

the earnout effect: top-tier investment banks, as well as boutique financial advisors, on either or both sides of the deal, add significant value to acquirers in earnout-based M&As. Prior earnout studies ignore the important effect of advisors when examining the valuation effects of earnouts in M&As.[8] We also find that the global diversification aspect of the deal matters, with acquirers enjoying higher gains from cross-border than domestic M&As based on earnouts. We further show there to be a curvilinear relation between the ratio of earnout value to total deal consideration (i.e., the relative earnout value, or REAV) and acquirers' gains. In particular, acquirers on average enjoy maximum benefit from earnout-based M&As when the REAV is roughly 30% of the total deal consideration. Lastly, we find that the REAV is significantly larger after the SFAS141(R) reform.

Our finding of strong correlations between the use of earnouts and acquirer gains might not reflect a causal relation, since certain firm or deal characteristics might affect both the choice of earnout and acquirer gains. To circumvent this identification problem, we examine the causal effect of earnout choice on acquirer gains by using two identification strategies, namely the Propensity Score Matching (PSM) method and a quasi-natural experiment. Our finding of a strong positive earnout effect remains robust after controlling for self-selection concerns using the PSM method, the effect of which is examined in the multivariate context after we apply the Hainmuller (2012) method and also the Stata routine developed by Hainmuller and Xu (2013). Our second approach addresses potential endogeneity concerns by utilizing the SFAS141(R) reform as a quasi-natural experiment. We find that acquirers enjoy higher gains from earnout-based M&As in response to an exogenous increase in earnout contract monitoring.

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[8] We focus only on financial advisors, rather than legal advisors, as it is the former who engage in financing and valuation matters during the deal process. An extensive discussion on the distinctive duties of financial and legal advisors is offered by Krishnan and Masulis (2013). However, we have also investigated the effect of legal advisors on the valuation effects of earnouts in M&As and found an insignificant relation. We thank an anonymous reviewer for suggesting this analysis.

Finally, our results are robust to various model specifications and alternative measures of acquirer gains. Our results add to our understanding of the workings and valuation effects of earnouts on acquirer value, and have important implications for managers and firms considering the use of earnout in M&As. Overall, we show that the earnout payment mechanism can help address merger valuation risk and create value for acquiring companies, but that the benefit of using earnouts varies significantly with firm- and deal-specific characteristics, deferred value size, and regulatory reforms, as well as with the type of external financial advisors involved.

The paper is structured as follows: Section 2 discusses the rationale for the use of earnout contracts in M&As and their associated valuation effects, and further sets out our testable hypotheses; Section 3 presents our methodology; Section 4 presents our sample and descriptive statistics; Section 5 presents and discusses our results; and finally, Section 6 offers our conclusions.

2. Rationale for Earnout Contracts in M&As and their Valuation Effects

2.1. The earnout valuation effects

Information asymmetries between companies in merger negotiations often lead to substantial disagreements over a merger's payoffs due to significant merger valuation risk (Hansen, 1987; Eckbo et al., 1990). This is more pronounced in deals involving unlisted (i.e., private or subsidiary) and often young acquired companies that operate in intangible-rich sectors such as hi-tech and healthcare. For such companies, in addition to the limited availability of firm-specific information (increasing the chance of adverse selection), the extent of intangibility of their assets can cause even larger and harder to estimate merger valuation risk. Moreover, in mergers involving such companies, the value of the combined entity is often highly sensitive to the continued commitment, effort, and creativity of only a few key personnel in the acquired company, whose retention in the combined entity during at least the integration phase of the deal presents an important source of value creation (creating a chance of moral hazard).

Managers of merging companies may have access to superior information about the valuations of the companies they manage, which can give rise to adverse selection (Akerlof, 1970), while the (unobserved) efforts of the vendor towards the objective of maximizing the merger payoff give rise to moral hazard. As a result, the earnout payment mechanism is regularly employed to "bridge the gap" in expectations between the buyer and the seller with regard to merger outcomes. Moreover, an additional premium is usually offered in earnout-based deals to persuade the target owners to accept deferred payment(s) (Kohers & Ang, 2000; Barbopoulos & Adra, 2016). Therefore, earnouts allow the merging firms to agree to disagree about the value potential of the deal, and yet still continue with the deal. Earnouts also help to retain key people in the target firm, at least during the integration phase of the deal or the earnout period. Setting stretching performance goals allows the vendor to receive a high deal value if performance targets are met, but also protect the acquirer from overpayment should such performance forecasts prove too optimistic.

Prior studies on earnouts in M&A show a positive earnout effect on acquirer value, yet the earnout effect is highly sensitive to several deal- or firm-related characteristics. Kohers and Ang (2000) and Barbopoulos and Sudarsanam (2012) show that earnout-based M&As, especially those exposed to the highest merger valuation risk, yield greater acquirer gains compared to those financed with single up-front payments of cash or stock.[9] Barbopoulos and Sudarsanam (2012) further show that "optimally" classified earnout occurrences, based on a likelihood model that predicts the "correct" earnout choice in a deal, yield even higher acquirer gains. Mantecon (2009) examines alternative methods of valuation uncertainty avoidance in cross-border deals and shows that the use of earnout predominantly benefits acquirers of domestic rather than foreign companies.[10]

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[9] Kohers and Ang (2000), for example, report a 2.20% 2-day cumulative abnormal return for earnout acquirers compared to 1.80% for cash and 1.13% for stock acquirers.

[10] Datar et al. (2001) show that due to several differences in accounting practices and corporate governance mechanisms worldwide, foreign bidders of US targets are less likely to use earnout than domestic (US) bidders.

However, Barbopoulos et al. (2018a) show that the earnout effect in acquisitions of foreign companies is inversely related to the extent of the acquiring firm's existing degree of global diversification, with more value added from using earnouts to acquirers with limited or no global diversification prior to the cross-border M&A announcement. Moreover, Barbopoulos et al. (2018b) show that acquirers' gains in earnout-based M&As are sensitive to the choice of payment method (i.e., cash, stock, a combination of the two, or other forms of payment) in the initial and deferred payment stages. Lastly, Alexakis and Barbopoulos (2019) further show that the earnout effect is potentially elusive due to the presence of a significant acquirer information dissemination effect in the majority of earnout-based M&As, predominately involving small acquiring firms. Overall, the positive earnout effect appears to be derived from the ability of earnouts to motivate information sharing between the merging companies, which contributes to the reduction in both adverse selection and moral hazard concerns, and, as a result, to the higher likelihood of merger success.

The use of earnout in a merger should therefore by itself be a strong signal regarding the quality of the acquired company's managers (often owners), who are prepared to accept the earnout terms and signal to the market their commitment to strive to maximize the performance of the combined entity during the integration phase of the deal. Our first hypothesis (H1) is therefore: *Earnout-based M&As yield higher acquirer risk-adjusted returns relative to M&As with single up-front payment (i.e., non-earnout).*

2.2. Firm and deal characteristics, and the earnout valuation effects

Typical earnout-based M&As involve small companies, with vendors being private or divested subsidiary (unlisted) companies operating in intangible-rich sectors. The merger valuation risk in such deals is high due to the limited information often available, particularly for small, unlisted companies (Barbopoulos et al. (2020) offer a comprehensive discussion of the valuation effects of small deals on acquirer value). In addition, the nature of acquired assets may lead to significant disagreements between the merging companies regarding the value and future prospects of the target firm. While earnouts are expected to reduce valuation risk in such deals, they come with their own issues. Their structure can be complex and highly

sensitive to the challenges involved in the valuation of the acquired company, in addition to bidder default risk and litigation risk, and hence the calculations of the merger's expected payoff (Kohers & Ang, 2000; Cain et al., 2011; Lukas et al., 2012; Battauz et al., 2021). These empirical facts suggest that the efficient risk sharing properties offered via the earnout can be largely attributed to the effective design of earnout payments, including the size of earnout payments, the time interval(s) between them, as well as the choice of performance metrics. Failure to structure earnouts properly may lead to significant legal disputes and to value-destroying M&As. Therefore, intense negotiations and technical expertise on how to structure the earnout contract is essential. We hypothesize that larger and older acquirers, with perhaps more resources and acquisition experience, are better able to negotiate earnout terms, and to have more of an advantage in negotiations with relatively small targets (i.e., when the relative deal size is low).

The relative earnout value (i.e., the fraction of deferred value relative to the full deal value) may also affect the stock price reaction around the announcement date of earnout-based M&As. While a high relative earnout value may signal significant disagreements between the merging partners about the merger payoff, it may also signal the high quality of the vendor, given they are prepared to accept a larger part of the deal's value being deferred and made contingent on future performance. The earnout valuation effects are therefore expected to vary with several deal- and firm-specific features, as well as different earnout structures. Our second hypothesis (H2) is therefore as follows: *Earnout-based M&As yield superior acquirer risk-adjusted returns in:*

a) *small deals,*

b) *deals announced by larger acquirers and hence [in combination with (a) above] low relative deal size transactions,*

c) *and deals announced by older acquirers,*

relative to remaining earnout-based M&As and M&As settled with single up-front payments.
2.3. Financial advisors and acquirer gains from earnout-based M&As

Earnout contracts exhibit several interesting peculiarities pertinent to their structure and whether their terms align with expectations regarding the successful M&A completion (Cain et al., 2011; Barbopoulos et al., 2018b). Cain et al. (2011) show that expected earnout payments are strongly related to various proxies for valuation uncertainty, as well as the characteristic properties of earnouts in mitigating valuation uncertainty.

Lukas et al. (2012) further argue that earnouts constitute intricate payments with substantial heterogeneity in contract terms and structures among different deals. Therefore, the effective risk sharing properties offered via the earnout can be largely attributed to the effective design of earnout payments. While these terms are endogenously determined, being part of the overall contract negotiations, they may significantly affect outcomes as they affect incentives. Accordingly, the outcome of earnout-based M&As can be expected to be positively related with the technical expertise and negotiation abilities required to structure earnouts well. As a result, external financial advisors (i.e., investment banks and boutique financial advisors), known for their specialization and value enhancing services, are likely to improve the terms of the earnout contract and increase the likelihood of merger success (see Bao & Edmans (2011) and Song et al. (2013) for discussions on the impact of financial advisors on merger outcomes). Such advisors are likely to be experienced in dealing with earnout contract terms.

The involvement of investment banks in the M&A process has been shown in prior literature to improve the merger payoff, given the advisor's ability to identify and extract significant synergies from the merger. This literature, however, concentrates on (a) the impact of mainly buy-side financial advisors, and (b) M&As that are settled in single up-front payments of cash or stock, whose contractual design avoids contingency considerations about future payments. Several scholars have also investigated the extent to which the advisor's reputation affects the variation in acquirers' risk-adjusted returns through the channels of better and more experienced advice (see Kale et al., 2003; Hunter & Jagtiani, 2003). Moreover, the involvement of boutique financial advisors in the M&A process of public target M&As has been shown to be associated with favorable M&A outcomes, such as a

decrease in takeover premia (Song et al., 2013). The authors present the *skill hypothesis*, which posits that boutique financial advisors tend to be hired in complex deals due to their specialization and industry expertise that can help acquirers address the valuation challenges in informationally demanding deals. They also present the *scale hypothesis*, which predicts that full-service banks focus their efforts on large M&As with substantial resources and advisory fees, which therefore makes boutique financial advisors' services likely to be concentrated in small and low-profile deals.

However, the literature has so far ignored the role of investment banks and boutique financial advisors on acquirer gains from earnout-based M&As. In this paper we set out to fill this void in the literature by studying the pricing effects of earnouts in M&As receiving external financial advice on one or both sides of the deal. We therefore set out our third (H3) hypothesis as follows: *Earnout-based M&As yield higher acquirer risk-adjusted returns in deals advised by top-tier financial advisors or boutique financial advisors compared to other earnout M&As and M&As settled in single up-front payments.*

3. Methodology

3.1. Measurement of acquirer returns

Our analysis is focused primarily on the effect of earnout provision on the returns of acquirers around the day of the M&A announcement. Consistent with numerous studies with similar sample characteristics (e.g., Fuller et al., 2002; Faccio et al., 2006; Barbopoulos et al., 2012, 2018a), the announcement period returns for acquirer i are estimated using the adjusted market model (AMM), consistent with Brown and Warner (1980; 1985):

$$AR_{it} = R_{it} - R_{mt} \qquad (1)$$

where AR_{it} is the abnormal return to acquirer i on day t, R_{it} is the stock return of acquirer i on day t, and R_{mt} is the value-weighted market return index (FTSE All Share or DataStream-US Market index, for the UK and the US, respectively) on day t. The announcement period Cumulative Abnormal Returns (CAR), our main performance measure, for acquirer i, is the

sum of the abnormal returns over a five-day window ($t-2$ to $t+2$) surrounding the deal's announcement (day $t=0$), as follows:

$$CAR_i = \sum_{t-2}^{t+2} AR_{it} \qquad (2)$$

To verify the robustness of our results, we also use other asset pricing techniques (the market model, CAPM, 3-factor Fama and French model, and 4-factor Carhart model) to estimate the acquiring firm's abnormal returns. The choice of model does not affect our results.

3.2. Multivariate analysis and factors shaping acquirer returns

We use the following regression specification (Equation 3) to test our main hypotheses, in addition to controlling for other known factors influencing the acquirer abnormal returns:

$$CAR_i = \beta_0 + \sum_{j=1}^{k} \beta_j X_{ij} + \tilde{\gamma}_t + \tilde{\delta}_c + \varepsilon_i \qquad i = 1 \dots N \qquad (3)$$

where CAR_i is the 5-day ($t-2$ to $t+2$) cumulative abnormal return for the acquirer, as estimated in Equation (2). The information set X_{ij} includes variables representing the presence and structure of earnout in M&As along with several other deal- and firm-specific factors that are known to affect the acquiring firm's value; the impact of each is measured and stacked in the vector β_j. The list of variables in X_{ij} includes the earnout dummy; the relative size of the deal, measured by the ratio of deal value to the acquirer value measured by its market capitalization 20 days prior to the M&A announcement day; the natural logarithm of the acquirer value, measured by its market capitalization 20 days prior to the M&A announcement day; the natural logarithm of deal value; the acquirer sigma; the acquirer market to book value as at 20 days prior to the M&A announcement day; the natural logarithm of acquirer age, measured by the number of days between the M&A announcement date and the date when the firm was first recorded in DataStream; and dummy variables assigned the value of one if the target is a private firm, if the deal is diversifying, if the target is based in a different country than the acquirer, and if the target is based in an intangible-rich sector, and zero otherwise, respectively. All variables are defined in Appendix Table A. $\tilde{\gamma}_t$

and $\tilde{\delta}_c$ represent year and acquirer nation fixed effects, respectively, and ε_i is a white noise error term.

3.3. Reforms to the earnout regulatory framework – SFAS141(R)

Traditionally, earnout consideration was recognized in the buyer's financial statements if and when the conditions for the payment of the earnout were satisfied. As recognized by the US Financial Accounting Standards Board (FASB, 2007), this could result in "…the appearance but not the economic substance of a bargain purchase. For example, no liability often was recognized for some contingent payment arrangements (for example, earnouts) at the acquisition date, which could result in the appearance of a bargain purchase by understating the consideration paid" (SFAS141(R), B379). This changed with the introduction of the revised US accounting standard for Business Combinations (SFAS141(R)). "This Statement, in contrast, requires the measurement and recognition of substantially all liabilities at their fair values on the acquisition date" (B379). Since the introduction of the revised accounting standard, effective from 2009, earnouts are now required to be recorded at fair value at the date of the deal closing. The recorded fair value is then subject to periodic adjustments based on the likelihood of payment or actual earnout payments that have occurred. Any such adjustment must be recorded as gain or loss in the buyer's income statement. The result of this rule is to accelerate the recording of contingent liabilities related to the earnout, improve monitoring of earnout payments, increase accountability and transparency, and reduce the likelihood of opportunistic manipulation or setting of overly optimistic performance goals. As this reform is expected to directly affect the demand for earnouts and the earnout contract design, we examine the impact of the policy reform on earnout use and its valuation effects.

Therefore, following the reform of the US accounting standard, we anticipate that merging firms' incentives to employ earnouts, as well as the structure of earnouts, will be

different compared to the pre-reform period.[11] Particularly, we anticipate that target managers who may be skeptical about the earnout process will be more prepared to accept the earnout contract terms and, possibly, accept even larger relative earnout fractions (i.e., higher REAV). Higher REAV would also be associated with higher takeover premia.[12] In addition, we expect the requirement for stricter disclosure and the need to be more transparent about the settlement of earnout payments to make them more attractive also to acquirers. For acquirers aiming to maximize value from M&As, higher transparency in the settlement phase of earnout payments helps market participants more easily evaluate the value creation potential of the deal. Lastly, higher transparency can also lead to fewer disputes between the merging firms, and also to bidders facing a lower risk of lawsuits in the integration phase of the deal. Therefore, the use of earnout in the post-reform period sends a strong signal that the merging firms are highly motivated and committed to maximizing value via earnout-based M&As.

4. Sample and Descriptive Statistics

4.1. The sample

The sample consists of M&As announced by UK and US listed companies between 01/01/1986 and 31/12/2016 (inclusive) and recorded by the Security Data Corporation (SDC) Thomson ONE. For a deal to remain in the sample, it must meet the following sample selection criteria: (a) the acquirer is a UK or a US firm listed on one of the major stock exchanges in the UK and the US, with a market value of at least $1 million, measured as at 20 days prior to the announcement of the M&A; (b) the deal value is at least $1 million, excluding fees; (c) the acquirer owned less than 10% of the acquired company's shares prior

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[11] While the relevant UK and International Accounting Standards (applicable in the UK since 2005) have also evolved over time, with a protracted debate about the appropriate accounting for contingent liabilities arising from acquisitions, there has not been such a clear regulatory change in the accounting for earnouts in the UK as took place in the US with the introduction of SFAS141(R). While IFRS3 requires acquirers to recognize contingent liabilities, there is no explicit reference to earnouts in the standard. We therefore restrict our analysis of the impact of regulatory change on the use of earnouts to our sample of US M&As.

[12] Barbopoulos and Adra (2016) have also shown that the premia offered in earnout-based deals increases with the REAV.

to the M&A announcement and aimed to control at least 50% of the shares after the deal's completion (so as to ensure the deal would involve a change in control); (d) the acquired company is private or a subsidiary (anywhere in the world); (e) to avoid the confounding effects of multiple deals, all M&As announced within five days surrounding another M&A by the same acquirer are excluded from the sample; (f) buy-backs, recapitalizations, spin-offs, exchange offers, and repurchases are excluded from the sample; (g) deals with acquirers having negative book value of equity, in the most recent reporting, are excluded from the sample (as in Lyon et al., 1999); and (h) M&As in which either the acquiring or the acquired company is a government organization are also excluded from the sample. Finally, we keep only M&As for which the daily stock price and market value of equity of the acquirer are available from DataStream (for the US sample we also confirm our findings based on data collected from CRSP and Compustat). Satisfying the above criteria leaves us with 31,214 M&As (9,577 announced by UK acquirers and 21,637 by US acquirers). 5,008 M&As (16% of the total sample) included earnouts – 2,688 announced by UK and 2,320 announced by US domiciled acquirers. However, while the total number of earnout deals is similar in the two countries, the proportion of M&As involving earnouts is much higher in the UK (at 28% of all M&As) compared to the US (11%).

Earnouts are increasingly common in the UK, the US, and many other countries with strong property rights and legal enforcement of contracts. Our data reveals that more than one in four unlisted target M&As announced by UK domiciled acquirers since 1986, and almost one in three since 2001, involve earnout payments. At their peaks in 2008 (2011), 38% (35%) of all unlisted target M&As announced by UK acquirers involved earnout payments. Similarly, the use of earnout has increased from less than 5% of all unlisted target M&As announced by US acquirers in the late 1980s to more than 10% each year since 2000, with peaks of 18% in both 2008 and 2011. Notably, after 2011, and in particular in 2016, earnout activity dropped for M&As announced by both UK and US acquirers of unlisted targets, to 24% and 10%, respectively. Moreover, the size of earnout-based M&As announced by UK (US) acquirers is substantial, representing at its peak 54% (24%) of the total deal value of all

unlisted target M&As (in 2009 and 2003, respectively).[13] Arguably, the increased use of earnouts in M&As announced by both UK and US acquirers since 2000 has been fueled by the record growth of M&As involving hard-to-evaluate target companies operating in the hi-tech, healthcare, and other intangible-rich sectors (Kohers & Kohers, 2001; Officer et al., 2009; Barbopoulos et al., 2018a).[14] Other countries with significant earnout activity include Ireland, Canada, Australia, South Africa, Germany, and the Nordic countries (see also Barbopoulos et al., 2018a). The UK and US markets for corporate control present excellent laboratories to study earnout-based M&As, given that they are the most earnout-active markets in the world (in terms of both absolute and relative activities).

The annual distribution of the relative earnout activity (i.e., annual ratio of earnout activity to total M&A activity) for M&As made by UK and US acquirers, separately, is shown in Figure 1. As also discussed by Maksimovic et al. (2013), Figure 1 shows that the variation in the activity of earnout-based M&As is cyclical, reaching peaks during periods of economic expansion (the late 1990s and mid-to-end-2000s) and troughs during periods of economic contraction (early 2000s and the period following the 2008 financial crisis). The lower earnout activity in the post-recession period in the US may also be due to the regulatory reforms (effective from 2009) that made earnouts potentially more carefully selected.

(Insert Figure 1 about here)

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[13] These figures are likely to be driven by the nature of the market for corporate control in the UK and US, respectively. Faccio and Masulis (2005) show that approximately 90% of UK (and Irish) acquisitions involve unlisted target firms, while Draper and Paudyal (2006) report that approximately 87% of UK acquisitions involve privately held targets. However, Moeller et al. (2007) show that approximately only 53% of US acquisitions involve unlisted targets.

[14] Increasing media attention has also been devoted to the earnout payment mechanism. In 2017, three articles in the Wall Street Journal (WSJ) highlight the importance of earnout growth in the era of high valuation risk. See "In Age of High Valuations, Earnouts Grow in Importance" (Haggin, on June 23, 2017), "Rise of 'Earnouts' Muddies M&A Waters" (Gormley & Haggin, updated on August 30, 2017) and "Startups Push for Leverage in Earnout Acquisition Deals" (Gormley, on October 3, 2017).

Table 1, which offers a detailed annual distribution of our sample, shows that the aggregate M&A activity (including earnout-based M&As) follows a pro-cyclical pattern, with significant declines during periods of economic downturn, such as the recession in the early 2000s and the aftermath of the global financial crisis of 2008. About half the deals in our sample are industry diversifying, and one in five with a foreign target. Regarding the payment method in non-earnout settled M&As, we find the largest share of the deals to be settled in cash (38.7%). The remaining deals in our sample are split between transactions settled with stock (15.0%) and mixed payment (30.3%). Almost two thirds (65.7%) of the deals in our sample involve private target firms, with the remainder being acquisitions of subsidiaries.

(Insert Table 1 about here)

4.2. Summary statistics

Summary statistics are recorded in Table 2. Earnout-based deals are generally smaller than deals settled in single up-front payments in cash, stock, or mixed payment ($78 million vs. $136 million). For the earnout sample, the maximum transaction value is $9.8 billion (unreported). The average stated earnout value, reflecting the full amount of potential earnout payments, is approximately $22 million, with a maximum earnout value of $4 billion and a minimum value of $130,000 (unreported).

Earnout-based M&As are smaller on average when the target firm is private, compared to earnout-based M&As of subsidiary target firms ($59 million vs. $157 million), yet the relative earnout ratio (i.e., the ratio of deferred deal value to total deal value) is much larger for M&As of private than subsidiary target M&As (38% vs. 32%). Cain et al. (2011) show that the relative earnout ratio is positively related to the riskiness of the deal and, hence, in deals that are subject to higher merger valuation risk or higher disagreement between the merging firms about the deal's valuation, the relative earnout ratio is much larger than otherwise.

(Insert Table 2 about here)

The summary statistics further show that M&As of companies operating in one of the intangible-rich sectors (i.e., Media, Retail, High Technology, Healthcare, or Telecoms

sectors, defined as in Barbopoulos et al. (2018a, 2018b)) have higher maximum stated earnout value, as well as high relative earnout ratio ($25 million and 39%, respectively), relative to the average earnout-based M&A in the sample. Once again, high values in these figures reflect the higher merger valuation risk embedded in M&As of companies operating in intangible-rich sectors. Further statistics show that, on average, acquiring firms engaged in earnout-based M&As are smaller, compared to acquirers in non-earnout M&As ($2,208 million vs. $3,709 million).[15] This suggests that smaller acquiring firms, who may be more sensitive to merger valuation risk, or have less access to external finance and are less likely to finance an M&A using their own shares (Bates et al., 2018), are more prone to employ the earnout payment mechanism in valuation-challenging M&As. Finally, the relative deal size shows that earnout-based deals have, on average, smaller relative deal size compared to non-earnout M&As (26% vs. 47%). Overall, the statistics indicate that earnout-based deals exhibit some interesting heterogeneities across different types of deals, which we expect to have different valuation effects upon the M&A announcements.

5. Results

5.1. Results from univariate tests

Results from our univariate tests are presented in Table 3. The average acquirer in our sample enjoys 1.72 percentage points cumulative abnormal returns (CAR) over the five-day event window. This is consistent with prior studies analyzing the valuation effects of unlisted target M&As, including private (CAR of 1.61 percentage points) and subsidiary (CAR of 1.93 percentage points) target M&As on acquirer returns (Chang, 1998; Fuller et al., 2002; Faccio et al., 2006; Barbopoulos et al., 2020). Acquirers in earnout-based M&As earn, on average, a significant CAR of 1.57 percentage points in the five-day event window. We further find that

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[15] Noticeably, the significantly larger (almost double in size) acquirers in non-earnout deals (=$4,879m), compared to earnout ones (=$2,442m), is generally driven by acquirers in cash (=$7,049m) or stock (=$4,728m) settled deals, rather than mixed (=$2,590m) deals. Acquirers in earnout-based, listed target deals are larger than counterparts in non-earnout-based M&As, whereas acquirers in earnout-based, private target deals are on average older than counterparts in non-earnout deals.

while acquirers in earnout and non-earnout-based M&As enjoy similar CARs (statistically insignificant differential of -0.17), some interesting heterogeneity is observed, which is pertinent to the contingent properties embedded in the corresponding non-earnout payment.[16] Specifically, while we find that acquirer returns from earnout-based M&As are 36 basis points higher than acquirer returns in deals settled in up-front cash payments without any contingent properties, they are 97 (45) basis points lower than acquirers' returns in deals settled in up-front stock (mix of cash and stock) payments with (some) contingent properties. Unreported results (available upon request) show that M&As announced by both US and UK domiciled acquirers contribute to these findings. These results offer partial support to the predictions of the earnout hypothesis (H1), that the contingent properties embedded in the earnout payment help acquirers alleviate valuation risk. As a result, earnout-based M&As create more value than deals with cash payments without any contingent payment properties.

(Insert Table 3 about here)

Unreported univariate results further show that acquirers in earnout-based M&As enjoy higher gains relative to non-earnout M&As from focused, as well as foreign target, deals, than from diversified and domestic ones, respectively. Acquirers also enjoy 69 and 22 basis points higher CAR from earnout-based M&As, with a larger component of the deal value being deferred (depending on whether the earnout value or the REAV is the underlying variable), relative to earnout deals with only a small component of deal value being deferred.

5.2. Results from multivariate tests

In this section, we examine the earnout effect within a multivariate setting where we simultaneously include factors we hypothesize to interact with the earnout effect, along with other factors known from prior literature to affect acquirers' gains. We also include non-linear effects, time fixed effects, and acquirer-nation fixed effects. Results from this analysis are reported in Table 4, based on the estimation of several versions of Equation (3). Model (1)

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[16] In a separate analysis (reported in Section 5.7 below), we show that the inclusion of listed targets in our analysis makes the earnout valuation effect higher and significant at the 1% level.

employs 31,214 acquisitions, 5,008 of which include earnout payments. The relationship between the acquirer CAR and earnout in Model (1) is found to be statistically insignificant, consistent with the overall earnout effect also reported in Table 3. Unreported results further show that the insignificant earnout effect is even obtained after we balance our treated and control samples based on the method proposed by Hainmuller (2012) and Hainmuller and Xu (2013).

However, Models (2-4) provide the first evidence of interesting heterogeneity among earnout-based M&As according to several deal and merging firms' characteristics. Specifically, we find that acquirers enjoy significant gains from small earnout-based deals (Model 2), suggesting that the earnout contributes to a reduction of the merger valuation risk associated with small unlisted and mostly opaque target firms, consistent with our hypothesis H2(a). We further find that large acquirers enjoy superior gains from earnout-based deals (Model 3), suggesting larger acquirers are better able to structure earnouts effectively and have the necessary resources to support them, consistent with our hypothesis H2(b). Model (4) further confirms this finding after examining the role of deal relative size, where we find that low relative size earnout-based deals add more value, consistent with our hypothesis H2(b). Results reported in Model (5) suggest that earnouts are more effective in M&As announced by more mature acquirers, indicating that more experienced acquirers, who have been around longer, are more able to support earnouts, consistent with our hypothesis H2(c). We further find that acquirers enjoy higher gains from earnout-based M&As of foreign targets, as shown by the marginally significant coefficient of *Foreign × Earnout* in Model (8). This adds to prior studies indicating that earnouts help acquirers mitigate merger valuation risk in complex deals (Mantecon, 2009; Barbopoulos et al., 2018a, 2018b). Overall, these results extend evidence from prior studies showing that earnouts are particularly challenging

to structure and, thus, more resourceful acquirers are likely better able to structure earnouts effectively (Cain et al., 2011).[17]

(Insert Table 4 about here)

In Models (9-11) we employ only the sample of earnout-based deals (N=5,008) to examine the relation between acquirers' gains and relative earnout value. The central variable in this model is the REAV. We find in Model (9) a negative and significant relation between acquirers' CAR and the REAV (coefficient of -1.292, significant at the 1% level). While this depicts an inverse relation between acquirers' CAR and REAV, this is against our theoretical predictions on earnout use, suggesting that a more complex and possibly nonlinear relation between acquirers' CAR and REAV is potentially present. We therefore set out to test this by including in the model both the REAV and its squared term (= $REAV^2$).[18] We find a significant curvilinear relation between acquirers' CAR and the REAV. The curve slopes upward until REAV reaches approximately 30% (29.8%) and then slopes downward. Figure 2 depicts this relation. Therefore, firms appear to benefit most from earnout-based deals when about 30% of the deal value is deferred to a future stage. This is consistent with prior discussions in this paper and in prior literature (Cain et al., 2011). In particular, deferring too

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[17] It is noteworthy that our analysis shows no significant gains from earnout-based diversifying M&As, as well as M&As involving targets operating in one of the intangible-rich sectors (defined in Appendix Table A).

[18] The main advantage of the quadratic regression model is that the turning point is determined empirically. It also assumes that there is only one turning point. Being aware of the limitations of this model regarding the sensitivity of the positioning of the turning point to the model's specification, we apply two sensitivity tests, as in McConnell and Servaes (1990). First, we include additional independent variables into the regression to determine whether our results are sensitive to the inclusion of other factors that have been found in prior studies to be important determinants of acquirers' CAR. These include financial leverage and the cash-to-assets ratio, among others. Our results are consistent with the general prediction of our initial nonlinear relation between REAV and acquirers' CAR. Second, we truncate the distributions of REAV at the 5th and 95th, as well as 10th and 90th, percentiles and re-estimate the regressions. This procedure ensures that a few large outliers do not drive our results. The significant curvilinear relation between REAV and acquirers' CAR is still borne out in the regressions on the truncated samples.

small a proportion of the deal value may provide insufficient incentive for information sharing and alignment of interests, while still requiring costly negotiations of the earnout contract terms and post-acquisition monitoring of target firm performance. On the other hand, deferring too large a proportion of the deal value may highlight the high degree of disagreements between the merging firms regarding the value of the target and hence the riskiness of the deal.

(Insert Figure 2 about here)

5.3. The impact of financial advisors on acquirer gains from earnout-based M&As

We now turn to the study of the effect of financial advisors on acquirer gains from earnout-based M&As. We classify financial advisors into top-tier investment banks and boutique financial advisors. We proceed by performing the following regression:

$$CAR_i = \beta_0 + \beta_1 \times Earnout + \beta_2 FA + \beta_3 \times (Earnout \times FA) + \sum_{j=1}^{k} \varphi_j X_{ij} + \tilde{\gamma}_t + \tilde{\delta}_c + \varepsilon_i \quad (4)$$

where CAR_i is the acquirer cumulative abnormal returns, as described in Equation (2). FA represents financial advisors, either top-tier or boutique financial advisors, on either the acquirer or target side, or both, depending on model specification. The information set X_{ij} accounts for several deal and firm characteristics, such as deal relative size, acquiring firm i's size, sigma, market-to-book ratio and age, and several dummy variables accounting for the presence of a private target firm, the extent of a target firm's sector intangibility of assets, whether the deal is a diversifying one, and finally whether the target firm is based in a foreign market. All variables are defined in the Appendix Table A. $\tilde{\gamma}_t$ and $\tilde{\delta}_c$ represent year and acquirer nation fixed effects, respectively, and ε_i is a white noise error term. Results from this analysis are reported in Table 5, based on the estimation of several versions of Equation (4).

(Insert Table 5 about here)

Results, in general, support the view that external financial advisors, whether top-tier investment banks or boutique advisors, contribute positively to acquirers' gains. Models (1, 3, and 5) extend evidence from prior literature that top-tier investment banks add value to acquirers of listed targets M&As (Kale et al., 2003; Golubov et al., 2012). We extend this

evidence by studying the impact of advisers in M&As involving unlisted targets. Importantly, besides that top-tier investment banks add value to acquirers in general, our analysis further reveals that top-tier investment banks add significantly more value to acquirer shareholders in earnout-based M&As (Models 2, 4, and 6). Interestingly, we find that such gains are more pronounced when top-tier investment banks are involved on the target firm's side (Model (4); coefficient of 1.311, significant at the 5% level), and even more when top-tier investment banks are used by both sides of the deal (Model (6); coefficient of 1.208, significant at the 5% level). We conjecture that target top-tier investment banks have much more profound incentives to structure earnouts effectively so as to deliver the expected payoffs to their clients (and receive the deferred payments), consistent with the 'better merger' and 'skilled negotiation' hypotheses of Kale et al. (2003) and Golubov et al. (2012), as well as with findings reported by Bao and Edmans (2011). These findings are consistent with hypothesis H3.

While Models (7, 9, and 11) reveal that acquirers overall break even in deals with boutique advisors, our analysis further shows that acquirers enjoy significant gains from earnout-based deals with boutique advisors on one or both sides of the deal (Models 8, 10, and 12). Song et al. (2013) show (in a sample of listed acquirers and targets) that boutique financial advisors are more likely to be used in smaller (listed target) M&As, and that deals where acquirers use boutique advisors are associated with lower premia. Our results suggest acquirers benefit the most from earnouts when they either have boutique financial advisors on their side (Model 8; coefficient of 2.097, significant at the 10% level) or when both merging firms are advised by boutique financial advisors (Model 10; coefficient of 1.254, significant at the 5% level). These findings support our hypothesis H3. Notably, we are the first to study the effect of both top-tier investment banks and boutique financial advisors on unlisted target deals, and where such deals include earnout payments. Lastly, unreported results (available upon request) show that acquirers employing top-tier investment banks in earnout-based M&As are potentially more resourceful firms: (a) they are significantly larger firms, (b) they

have a significantly higher cash-to-assets ratio in the most recent reporting, and (c) they have a significantly higher return-on-assets ratio in the most recent reporting.

5.4. Control variables

Results reported in Tables 4 and 5 are estimated after controlling for various factors that are known to affect the acquirers' gains. Specifically, Asquith et al. (1983) and Fuller et al. (2002) show that acquirer CAR is positively related to the relative size of the deal (i.e., the ratio of the deal value to the market value of the acquirer 20 trading days prior to the M&A announcement). Across all models in which the relative size of the deal is employed as a control factor, we find a strong positive relation between the acquirer CAR and the relative size of the deal to the size of the acquirer. Moeller et al. (2004) demonstrate that the acquirer CAR is negatively related to the acquirer size, measured by the natural logarithm of the acquirer's market capitalization 20 days prior to the M&A announcement day. Our results, which are in line with prior literature, show that shareholders of small acquirers experience, on average, significantly higher CAR than large acquirers. The size of the deal is also shown to affect the acquirer CAR (Barbopoulos et al., 2018b; Stulz et al., 1990). To control for this effect in our multivariate tests, the natural logarithm of the deal value is employed. Our results show that acquirers of larger deals enjoy significant gains in the short run (Model (3) of Table 4).

Moeller et al. (2007) demonstrate the importance of information asymmetry on acquirer CAR. Following their approach, we proxy for the extent of the acquiring firm's information asymmetry in our multivariate tests, using the acquirer's sigma, measured by the standard deviation of the residuals in the CAPM model over the period $t - 256$ and $t - 6$, where $t = 0$ is the M&A announcement day. Across all models in which the acquirer sigma is employed, we find a positive relation between the acquirer CAR and acquirer sigma, consistent with prior studies (Alexakis & Barbopoulos, 2019). Previous research has also shown that an acquiring firm's valuation affects its CAR in the short run (Chemmanur et al., 2009; Moeller & Schlingemann, 2005). Along these lines, Rau and Vermaelen (1998) have shown that the acquirer CAR is sensitive to its market-to-book valuation. Across all models in

which the acquirer MTBV is employed, we find a negative relation between acquirer CAR and acquirer MTBV.

Zhang (2006) shows that investors tend to have more information on firms with a longer trading history, and such firms tend to have lower information asymmetry. Therefore, we employ in our analysis the age of the acquirer, measured by the log of the number of days between the day of the M&A announcement and the date when the company was first recorded in Datastream. The listing status of the target firm has also been shown to affect acquirer CAR (Chang, 1998; Draper & Paudyal, 2006; Faccio et al., 2006). Chang (1998) argues that private target acquisitions are more profitable investments for acquirers compared to public target ones, due to limited information and competition for private target firms, as well as the more effective monitoring of targets' managers in the combined entity during the merger integration period. While our analysis is restricted to unlisted targets, our sample includes acquisitions of both private targets and subsidiaries. We include a dummy variable taking the value of one when the target is private, and zero otherwise. We find that acquirers of private targets experience, on average, significantly lower short-run abnormal returns than acquirers of subsidiary targets, as in Fuller et al. (2002).

Both the target valuation risk and the overall deal's post-acquisition integration challenges increase with the target's level of intangible assets. To account for this effect in our analysis, an intangible-rich sector dummy, assigned the value of one if the target is operating within Media, Retail, High Technology, Healthcare, or Telecommunication sectors, and zero otherwise, is employed. We find that acquirers of targets operating in an intangible-rich sector, in general, experience significant negative announcement period abnormal returns. If both the target and the acquirer belong to the same industrial sector, their integration may be easier, and the synergy gains are likely to be higher (Barbopoulos & Sudarsanam, 2012). On the other hand, firms acquiring targets that operate in an unrelated sector may also gain from diversification, thereby resulting in a reduction in the volatility of the combined firm's cash flows and the cost of capital. However, Morck et al. (1990) find that returns to acquirer shareholders are lower when their firm diversifies. Therefore, to control

for the potentially influential effect of corporate diversification, a dummy variable that is assigned the value of one for diversifying deals (i.e., where the target and acquirer do not share the same two-digit Standard Industrial Classification (SIC) code), and zero otherwise, is employed in our tests. Our results show, in general, mixed evidence regarding the industrial diversification effect on acquirer CAR. Finally, if the target firm is operating in a foreign country, its valuation risk, as well as the overall deal's post-acquisition integration challenges, are likely to be higher. To account for the impact of foreign acquisitions on acquirer CAR, we employ a dummy variable assigned the value of one if the target is foreign, and zero for domestic deals. Once again, our results show mixed international diversification effect on acquirer CAR.

5.5. Addressing self-selection concerns in univariate and multivariate tests

Our finding of strong correlations between the use of earnout and acquirer gains might not reflect a causal relation since certain characteristics might affect both the choice of using earnout, and acquirer's gains. To address identification problems in our analysis, we examine the causal effect of earnout choice on acquirer gains by using two identification strategies, namely the Propensity Score Matching (PSM) method and a quasi-natural experiment.

5.5.1. Propensity Score Matching

We first address self-selection bias concerns based on the Propensity Score Matching (PSM) method (Rosenbaum & Rubin, 1985; Rosenbaum, 2002), where results are confirmed based on a multivariate reweighting method described in Hainmueller (2011). We use six different matching ratios (1-to-1, 2-to-1, 3-to-1, 4-to-1, 5-to-1, and 10-to-1), with close propensity scores, in which we allow replacement, except in the 1-to-1 matching ratio. where we perform analyses with and without replacement. Results are reported in Table 6.

Panel A (of Table 6) reports results from our univariate analysis of acquirer CAR based on the PSM approach. Our 1-to-1 matching ratio, with or without replacement, shows that acquirers earn 67 and 56 basis points higher CAR from earnout than non-earnout deals. These differences are statistically significant at the 5% level. Similar conclusions are obtained with

the remaining matching ratios. Therefore, our results are robust to controlling for self-selection bias concerns using the PSM method.

(Insert Table 6 about here)

To address self-selection bias concerns in a multivariate framework, we estimate the earnout effect in the matched sample that is comprised of earnout and non-earnout based M&As sharing similar characteristics. The sample is constructed based on the PSM method. In Panel (B) we report OLS regression estimates on the impact of earnout on acquirer gains without applying the multivariate reweighting method before estimating each regression. However, in Panel (C) we report estimates from OLS regressions on the impact of earnout on acquirer gains after applying the multivariate reweighting method (Hainmuller & Xu, 2013). As in our univariate tests, we use six matching ratios (1-to-1 with and without replacement, 2-to-1, 3-to-1, 4-to-1, 5-to-1, and 10-to-1), with close propensity scores, in which we allow replacement except in the 1-to-1 matching ratio, where we perform analyses both with and without replacement. The results show that acquirers enjoy significant gains from earnout-based M&As, irrespective of the matching ratio that we use. Specifically, the coefficients for the earnout dummy variable range from 0.54 and 0.64 in Panel (B), all significant at least at the 5% level. Coefficients estimated after we apply the entropy balancing (Hainmuller & Xu, 2013) range from 0.48 and 0.60 in Panel (C), again all significant at least at the 5% level. Overall, the results reported in Table 7, which are less likely to be affected by self-selection bias concerns, offer further support to our earnout hypotheses (H1) predicting the positive earnout effect of earnout-based M&As.

5.5.2. SFAS141(R) as a quasi-natural experiment

In this section we aim to test whether the reform of the US regulatory framework under which earnouts operate (SFAS141(R), effective from 2009) affected the valuation effects of earnouts to acquirer shareholders. The reforms were expected to improve the monitoring, accountability, and transparency of the earnout payment process, while also reducing the likelihood of opportunistic manipulation or setting of overly optimistic performance goals, or even unintentional errors affecting accounting-based benchmarks. Therefore, firms employing

earnouts in the post-reform period send a signal about their quality regarding their efforts in maximizing synergies from the deal. In examining the impact of the reform on the valuation effects of earnouts, we estimate the following difference-in-difference specification:

$$CAR_i = \beta_0 + \beta_1 \times Earnout_i + \beta_2 \times PostSFAS(R)_t + \beta_3(Earnout_i \times PostSFAS(R)_t) +$$

$$\sum_{j=4}^{k} \beta_j X_{ij} + \tilde{\gamma}_t + \varepsilon_i \ \ i = 1 \ldots N \tag{5}$$

CAR_i represents the acquirer CAR (estimated in Equation 2). Earnout is a dummy variable assigned the value of one if a deal includes earnout payments (the treatment group), and zero if the deal is fully settled with an up-front payment (the control group). The $PostSFAS(R)_t$ is a dummy variable taking the value of one after the regulatory reform (the treatment), effective from 2009, and zero otherwise. $\sum_{j=4}^{k} \beta_j X_{ij}$ represents the effects of a diverse set of control variables, and ε_i is a white noise error term. In Equation (5), β_0 captures the baseline average, β_1 captures the treatment group specific effect (to account for average permanent differences between treatment and control), β_2 captures the time trend common to control and treatment groups, while β_3 represents the differences in change over time or the true effect of the treatment. Results are reported in Table 7 (Models 1-5).

(Insert Table 7 about here)

Our results on the impact of the policy reform on acquirer CAR reveal that acquirer returns are in general (irrespective of payment method) significantly lower after the introduction of SFAS141(R) than they were before ($\beta_2 = -1.007$). However, the results further reveal a positive and significant increase in the earnout effect ($\beta_3 = 1.088$). To examine the estimated mean difference in acquirer CAR between the treatment (earnout) and control (non-earnout payment) groups after the regulatory reform, we test whether $\beta_1 + \beta_3 = 0$. The hypothesis of $\beta_1 + \beta_3 = 0$ is rejected in most models, hence suggesting a significant treatment effect following the implementation of the SFAS141(R) reform.

5.6. Tests of the impact of policy reform (SFAS141(R)) on earnout structure (REAV)

As discussed in the Introduction and also in Section 3.3, we next aim to test whether the reform of the US regulatory framework under which earnouts operate (SFAS141(R),

effective from 2009) affected the earnout structure. The reforms were expected to improve the monitoring, accountability, and transparency of the earnout payment process, while also reducing the likelihood of opportunistic manipulation or setting of overly optimistic performance goals, or even unintentional errors affecting accounting-based benchmarks.

In examining the impact of the reform on the earnout structure and the valuation effects of earnouts, we estimate the following difference-in-difference specification:

$REAV_i =$

$\beta_0 + \beta_1 \times Earnout_i + \beta_2 \times Post\ SFAS\ (R)_t + \beta_3(Earnout_i \times Post\ SFAS\ (R)_t) +$

$\sum_{j=4}^{k} \beta_j X_{ij} + \tilde{\gamma}_t + \varepsilon_i \ \ i = 1 \dots N$ (6)

$REAV_i$ represents the relative earnout value. Earnout is a dummy variable assigned the value of one if a deal includes (additional) payments (the treatment group), and zero if the deal is fully settled with an up-front payment (the control group). The $PostSFAS(R)_t$ is a dummy variable taking the value of one after the regulatory reform (the treatment) effective from 2009, and zero otherwise. $\sum_{j=4}^{k} \beta_j X_{ij}$ represents the effects of a diverse set of control variables, and ε_i is a white noise error term. In Equation (5), β_0 captures the baseline average, β_1 captures the treatment group specific effect (to account for average permanent differences between treatment and control), β_2 captures the time trend common to control and treatment groups, while β_3 represents the differences in change over time, or the true effect of the treatment. Results are reported in Table 7 (Models (6-10)).

Our results on the impact of the policy reform (SFAS141(R)) on REAV (Model (1)) suggest that the REAV is significantly larger ($\beta_3 = 0.019$, significant at the 5% level) in the post-intervention period (effective in 2009), relative to the pre-intervention period. Ceteris paribus, the proportion of deal value deferred in earnout deals increased from approximately 32% to 34% following the regulatory change.

5.7. Acquirer gains from listed target earnout-based M&As

In addition to our main analysis that is executed based on private and subsidiary target M&As only, we investigate the valuation effects of earnout payments in listed target M&As.

Earnout payments in listed target M&As in our sample are used in only 63 deals (less than 1% of the sample). For the full sample (both US and UK) we find that acquirers earn 1.76 percentage points higher gains from earnout-based M&As of listed companies relative to counterpart deals settled with single up-front payments. For the US sample, we find this differential to be 2.16 percentage points.[19] When differentials are calculated between the earnout and stock or mixed portfolios, we find the earnout gains to be economically significant, averaging between 2.50 and 3.00 percentage points higher CARs for earnouts than for stock or mixed, respectively.

Moreover, our univariate analysis shows that once listed target acquisitions are included in the analysis, the overall earnout effect on acquirer gains is 0.36 percentage points and significant at the 1% level. The multivariate analysis further confirms this (coefficient of earnout dummy = 0.230). Therefore, the inclusion of listed target M&As in the analysis has a negative effect on the performance of the control portfolio comprised of single up-front payments in cash, stock, or mixed, ultimately distorting the earnout effect in deals where it is mostly used. (To conserve space these results are unreported but available upon request).

5.7. Practical implications for corporate managers

The results of this paper have several important implications for corporate managers who are considering participation in earnout-based M&As, for equity investors, and for the investment management community more generally. We recognize that while these three groups of managers maximize different objectives, a common objective to them all is their desire to participate in investments that deliver higher value and, hence, higher returns. Firstly, corporate managers of acquiring firms may like to reflect upon our findings when negotiating the acquisition of targets which are difficult to value and that tend to operate in

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[19] A long-standing result in the M&A literature is that stock settled, listed target M&As are associated with significant acquirer losses due to information asymmetry over the acquiring firm and the signalling that its equity is overvalued (Myers & Majluf, 1984; Hansen, 1987; Travlos, 1987). We show that acquirers can benefit from earnouts that reduce merger valuation risk due to information asymmetry over the acquired company, while also avoiding most of the well-established stock-financing mispricing discount.

intangible-rich or valuation-opaque sectors and consider the use of earnout payment mechanism in the deal. The value of the target firm in such deals often depends on the flair, creativity, and skill of only a few key personnel, whose retention in the integration period of the deal plays a critical role for the successful integration and completion of the deal. Earnouts can motivate such retention and, depending on their structures, can enhance commitment and the successful creation of merger synergies. Corporate managers of target firms may also like to reflect upon our findings when negotiating their participation in an earnout-based M&A. In particular, in maximizing the merger payoff, and also the odds of receiving the maximum amount of earnout payment, the acquired company's managers may like to embed the suggestions derived from our findings in their carefully designed earnout agreements.

Secondly, equity investors who are considering committing funds to a project or a firm may reflect upon our findings and invest in firms that carefully design earnouts, and, hence, participate in earnout-based M&As of companies operating in intangible-rich sectors. Earnout-based M&As are more likely to deliver higher returns relative to M&As that are settled in single up-front payments of cash, as shown by our univariate and multivariate tests. Investing in projects whose valuation is carefully executed, and where incentives to achieve their future potential are aligned via earnout contracts, are more likely to maximize investors' primary objectives of maximum returns while also minimizing merger valuation risk.

Thirdly, portfolio managers may also like to reflect upon our findings when constructing equity portfolios. Specifically, they may like to consider our findings when investing in the equity of firms that are participating in earnout-based M&As. Considering the various factors that interact with the earnout effect in M&As, portfolio managers may like to consider our results when designing equity portfolios that maximize their return maximization principle.

6. Conclusions

Over the past three decades, there has been a surge of Mergers and Acquisitions (M&As) with an earnout as part of the merger agreement. Earnout-based M&As are in

general subject to higher merger valuation risk, and earnouts are commonly used in acquisitions of unlisted (private or subsidiary) companies, with high information asymmetry and often operating in an intangible-rich sector such as hi-tech or healthcare. Considerable media attention has also been devoted to earnout-based M&As. In this paper we provide comprehensive answers regarding the pricing effects of earnouts in M&As. Our results are of significant practical relevance to corporate managers. We employ standard event study methodology and a comprehensive sample of 31,214 M&A transactions involving unlisted target firms that are announced by UK and US domiciled acquirers.

Our results show that, on average, acquirers' gains are higher in earnout deals than in conventional M&As with a single up-front payment in cash, but lower than in stock-based acquisitions. We also find that earnout-based deals add more value for large and mature acquirers engaged in M&As with relatively small targets. We further find earnout effects to be higher for acquirers of foreign firms and acquirers advised by top-tier or boutique advisors. The results suggest that the earnout effect is particularly pronounced in riskier deals of private and subsidiary companies, and when announced by large and mature acquirers with perhaps more experience, and also more resources to effectively design and support earnouts. We address identification concerns using the PSM method, the effect of which is examined in the multivariate context after we apply the Hainmuller (2012) and Hainmuller and Xu (2013) method, as well as through a quasi-natural experiment. We also find that regulatory change has affected the use and impact of earnouts, with the relative earnout value (REAV) in the US significantly larger in the post-reform (SFAS141(R)) period (effective from 2009).

Lastly, we present three results for the first time in this line of research. Firstly, we show that once listed target M&As are excluded from the analysis of earnout effects on M&As, the generally positive effect of earnout fades away. This is due to the negative effect of stock-financed listed target M&As in the control group of non-earnout deals. Secondly, we are the first to examine the valuation effects of earnouts in M&As where the acquirer or the target firms are either individually or jointly advised by top-tier investment banks or boutique financial advisors. Third, acquirers realize the highest returns from earnout-based M&As

when the deferred part of the deal consideration is roughly 30% of the total deal consideration. Our results have several practical implications to corporate managers who wish to employ earnouts in their M&As or to invest in firms undertaking earnout-based M&As.

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Table 1. Annual distribution of our sampled M&As by deal and firm characteristics

Year	All Deals	Domestic	Focused	Cash	Stock	Mixed	Earnout	Private	Deal Val. (All)	Acq. MV (All)	Deal Val. (Earnout)	Acq. MV (earnout)	Relative Size	CAR	Earnout Value	Rel. Earn. Value
1986	163	143	94	43	66	46	8	104	136	1,347	123	520	37%	0.876	24.93	38%
1987	260	231	140	91	82	56	31	169	78	941	45	395	47%	1.412	22.42	42%
1988	461	382	202	182	53	119	107	309	55	790	12	439	28%	0.641	5.76	46%
1989	677	545	317	281	103	159	134	388	49	711	25	400	29%	0.259	7.61	45%
1990	483	381	228	221	67	113	82	253	49	910	12	326	33%	0.726	5.02	45%
1991	468	389	247	165	90	140	73	262	40	1,080	16	333	27%	2.278	4.22	35%
1992	699	592	375	214	163	247	75	415	40	907	35	1,130	40%	1.620	8.23	37%
1993	935	821	484	319	228	282	106	559	43	702	23	235	34%	2.277	6.99	39%
1994	1,164	1,018	638	393	239	413	119	767	45	811	20	354	52%	1.890	5.90	35%
1995	1,166	982	638	387	282	365	132	769	51	763	54	356	54%	1.726	10.84	35%
1996	1,448	1,224	761	474	368	455	151	1,004	63	1,187	58	573	31%	2.112	11.9	32%
1997	1,888	1,585	958	614	398	658	218	1,270	96	1,513	36	612	28%	1.747	8.56	36%
1998	1,891	1,560	1,006	672	370	620	229	1,291	84	1,940	44	868	24%	1.754	13.0	34%
1999	1,602	1,303	898	536	398	460	208	1,104	120	4,689	46	947	43%	3.911	10.38	37%
2000	1,679	1,321	936	463	487	478	251	1,193	134	7,427	83	3,388	43%	1.064	17.83	41%
2001	1,151	897	612	373	206	345	227	737	156	3,766	64	814	53%	3.047	18.83	39%
2002	1,090	900	590	476	121	300	193	679	96	2,542	50	1,226	46%	3.160	14.91	39%
2003	891	743	513	411	94	219	167	559	88	2,806	106	2,618	45%	2.976	23.85	34%
2004	1,210	972	695	554	93	344	219	827	95	4,816	64	1,849	37%	2.336	21.27	35%
2005	1,406	1,105	795	645	129	387	245	1,002	137	3,435	70	2,146	81%	3.024	18.19	36%
2006	1,368	1,076	738	646	87	359	276	947	129	3,648	75	2,418	61%	2.004	13.73	35%
2007	1,379	1,051	783	635	81	352	311	979	160	5,614	61	2,865	56%	2.195	21.85	35%
2008	946	717	536	434	64	221	227	653	123	3,778	87	1,465	45%	1.770	25.21	37%
2009	603	462	346	279	62	141	121	366	242	4,450	161	3,477	49%	2.411	31.05	38%
2010	819	599	440	418	66	166	169	512	237	5,709	84	3,649	105%	2.555	32.23	40%
2011	852	616	433	417	63	182	190	531	186	4,752	99	3,349	33%	1.877	31.46	39%
2012	826	620	453	457	42	172	155	502	237	5,554	173	3,468	28%	2.456	45.00	36%
2013	771	605	424	421	51	153	146	487	218	5,819	140	4,149	36%	1.672	47.33	36%
2014	975	757	540	510	66	224	175	654	259	6,838	147	6,416	37%	2.604	38.13	34%
2015	1,097	849	532	259	39	650	149	684	270	5,455	160	4,858	33%	1.872	56.65	33%
2016	846	676	387	97	17	618	114	517	237	5,837	257	7,717	40%	2.118	86.54	32%
Sum	31,214	25,122	16,739	12,087	4,675	9,448	5,008	20,493	-	-	-	-	-	-	-	-
%	-	80.48	53.63	38.72	14.98	30.26	16.04	65.65	-	-	-	-	-	-	-	-
Average	-	-	-	-	-	-	-	-	127	3,468	78	2,208	44%	1.721	22.09	37%

The table presents the annual distribution of the main variables entering our analysis. "All" corresponds to all M&As; "Domestic" corresponds to deals where the acquirer's and target's domiciles coincide; "Focused" corresponds to deals in which acquirer and target operate in the same industry, i.e., they share the same two-digit SIC code; "Cash" corresponds to single up-front financed deals in cash; "Stock" corresponds to single up-front financed deals in stock; "Mixed" corresponds to single up-

front financed deals in cash and stock; "Earnout" corresponds to earnout-based M&As; "Private" corresponds to deals involving private targets; "Deal value" reflects the deal's transaction value (in $mil.); "Acquirer Market Value" corresponds to the acquiring firm's market capitalization (measured 20 days prior to the deal's announcement); "Deal Relative Size" corresponds to the relative size of the deal (=deal value/acquirer's market value 20 days prior to the deal's announcement); "CAR" reflects the acquirer cumulative abnormal returns as in Eq. 2.; "Earnout value" refers to the value (in $m) of the deferred payment in an earnout-based M&A; "Relative Earnout Value" corresponds to the relative earnout size of the deal (=earnout value/deal value). Variables are defined in Appendix A.

Figure 1. Annual relative earnout activity in M&As announced by US and UK domiciled acquirers
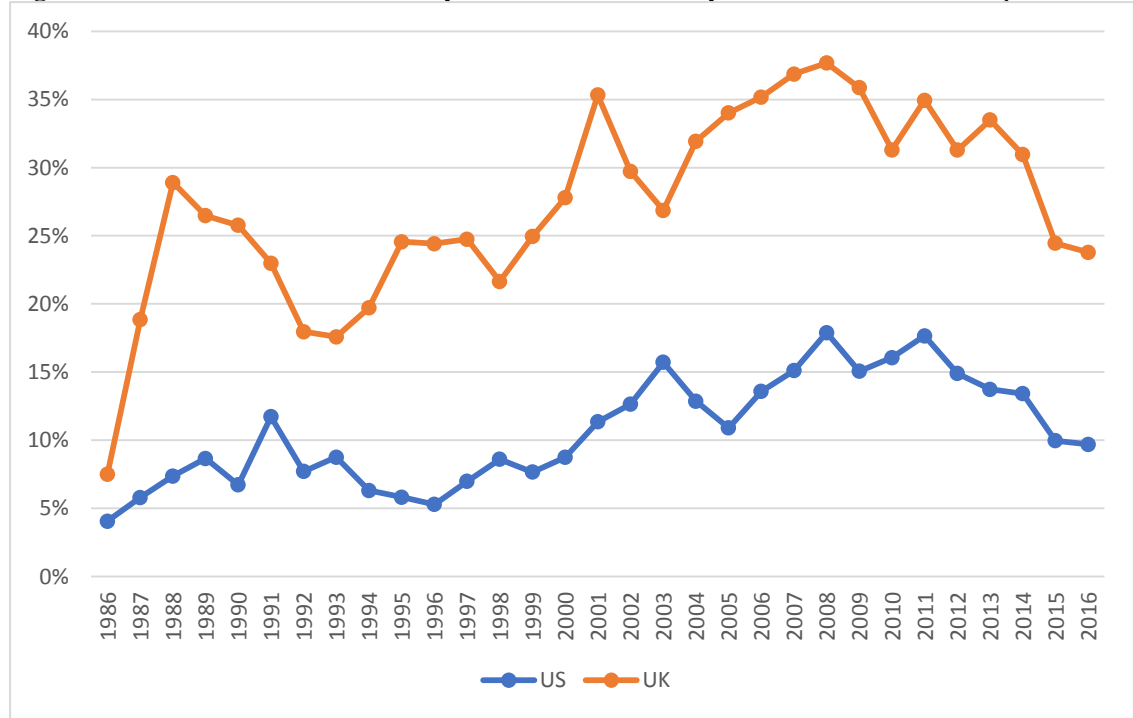
The figure depicts the annual relative earnout activity (=ratio of number of earnout-based M&As/total number of M&As) announced by US and UK domiciled acquirers, respectively.

Figure 2. Curvilinear relation between REAV and Acquirers' CAR
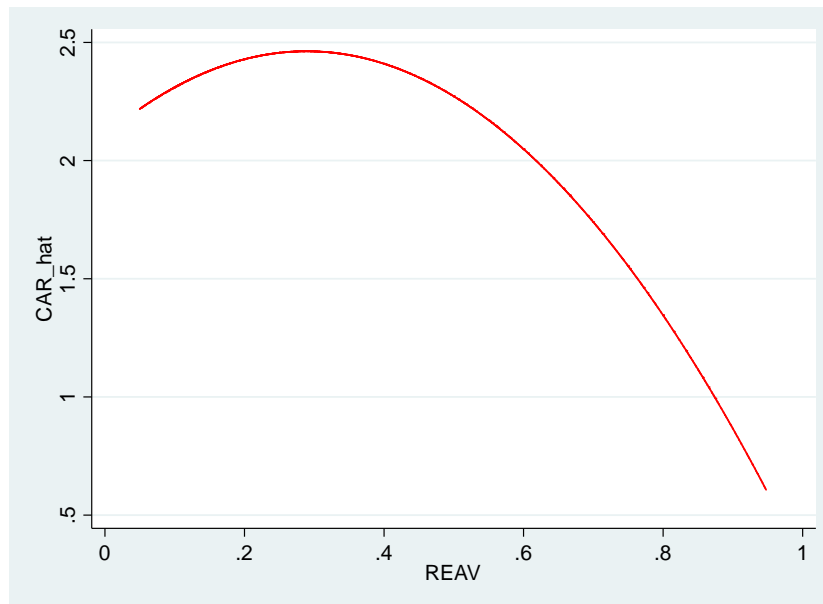
The figure depicts the estimated mean announcement period five-day $(t-2, t+2)$ cumulative abnormal returns (CAR) as a function of the proportion of deal value that is deferred (i.e., the relative earnout value as a fraction of total deal value, or REAV).

Table 2. Descriptive statistics

	N	Deal Value	Acquirer Market Value	Deal Relative Size	Acquirer Age	Earnout Value (N)	Relative Earnout Value (N)
All	31,214	127	3,468	0.436	12.2	22.09 (5,008)	0.368 (5,008)
Earnout (EA)	5,008	78	2,208	0.263	12.1	22.09 (5,008)	0.368 (5,008)
Non-Earnout (NEA)	26,206	136	3,709	0.469	12.2	-	-
Cash	12,087	136	5,200	0.181	14.8	-	-
Stock	4,675	76	3,549	1.148	7.9	-	-
Mixed	9,444	167	1,879	0.502	11.1	-	-
Private	20,493	70	2,879	0.426	11.3	20.10 (4,037)	0.379 (4,037)
EA	4,037	59	1,800	0.268	11.9	20.10 (4,037)	0.379 (4,037)
NEA	16,456	72	3,144	0.464	11.2	-	-
Subsidiary	10,721	237	4,593	0.455	13.9	30.36 (971)	0.323 (971)
EA	971	157	3,902	0.240	13.1	30.36 (971)	0.323 (971)
NEA	9,750	245	4,662	0.477	14.0	-	-
Focused	16,739	148	3,000	0.360	11.4	28.02 (2,624)	0.367 (2,624)
EA	2,624	94	2,743	0.258	11.4	28.02 (2,624)	0.367 (2,624)
NEA	14,115	158	3,048	0.379	11.4	-	-
Diversified	14,475	103	4,009	0.523	13.2	15.57 (2,384)	0.370 (2,384)
EA	2,384	60	1,618	0.267	13.0	15.57 (2,384)	0.370 (2,384)
NEA	12,091	111	4,480	0.574	13.2	-	-
Target in Intangible-Rich Sector	19,411	120	4,148	0.434	10.7	25.27 (3,595)	0.390 (3,595)
EA	3,595	78	2,659	0.234	11.0	25.27 (3,595)	0.390 (3,595)
NEA	15,816	129	4,487	0.479	10.6	-	-
Domestic	25,122	123	2,957	0.424	11.4	21.22 (3,800)	0.367 (3,800)
EA	3,800	73	2,072	0.278	11.3	21.22 (3,800)	0.367 (3,800)
NEA	21,322	132	3,115	0.450	11.4	-	-
Foreign	6,092	145	5,573	0.484	15.7	24.83 (1,208)	0.372 (1,208)
EA	1,208	95	2,636	0.214	14.8	24.83 (1,208)	0.372 (1,208)
NEA	4,884	157	6,299	0.551	15.9	-	-

The table presents descriptive statistics of the main variables entering our analysis. "All" corresponds to all M&As; "Earnout" corresponds to earnout-based M&As; "Non-Earnout" or "NEA" corresponds to non-earnout-based M&As; "Cash" corresponds to single up-front financed deals in cash; "Stock" corresponds to single up-front financed deals in stock; "Mixed" corresponds to single up-front financed deals in cash and stock; "Private" corresponds to deals involving private targets; "Subsidiary" corresponds to deals involving subsidiary targets; "Focused" corresponds to deals in which acquirer and target operate in the same industry, i.e., they share the same two-digit SIC code; "Diversified" corresponds to diversifying deals in which acquirer and target operate in different industries, i.e. they do not share the same two-digit SIC code; "Target in Intangible-Rich Sector" corresponds to deals involving targets operating in intangible-rich sectors (consumer products and services, financials,

healthcare, hi-tech, media and entertainment, and telecommunications); "Domestic" corresponds to deals where the acquirer's and target's domiciles coincide; "Foreign" corresponds to cross-border acquisitions in which the acquirer and target are based in different countries; "Deal value" reflects the deal's transaction value (in $mil.); "Acquirer Market Value" corresponds to the acquiring firm's market capitalization (measured 20 days prior to the deal's announcement); "Deal Relative Size" corresponds to the relative size of the deal (=deal value/acquirer's market value 20 days prior to the deal's announcement); "Acquirer Age" corresponds to the number of years between the acquirer's first recorded day on Datastream and the deal's announcement day; "Earnout value" refers to the value (in $m) of the deferred payment in an earnout-based M&A; "Relative Earnout Value" corresponds to the relative earnout size of the deal (=earnout value/deal value). All variables are defined in Appendix A.

Table 3. Univariate analysis of acquirer abnormal returns

ALL		All	Private	Subsidiary
All	Mean	1.72***	1.61***	1.93***
	N	31,214	20,493	10,721
Earnout (1)	Mean	1.57***	1.47***	1.99***
	N	5,008	4,037	971
Non-Earnout (2)	Mean	1.74***	1.64***	1.92***
	N	26,206	16,456	9,750
Cash (3)	Mean	1.21***	0.95***	1.48***
	N	12,087	6,119	5,968
Stock (4)	Mean	2.55***	2.37***	3.54***
	N	4,675	3,948	727
Mixed (5)	Mean	2.03***	1.85***	2.40***
	N	9,444	6,389	3,055
Differentials				
(1) vs. (2)	Mean	-0.17	-0.16	0.07
(1) vs. (3)	Mean	0.36***	0.52***	0.51**
(1) vs. (4)	Mean	-0.97***	-0.89***	-1.55***
(1) vs. (5)	Mean	-0.45***	-0.37**	-0.41

The table presents mean announcement period 5-day ($t - 2, t + 2$) cumulative abnormal returns for all acquisitions split by target listing status (All, Private target, and Subsidiary target) and method of payment (All, Earnout, Non-Earnout, Cash, Stock, and Mixed). "All" refers to all M&As, "Earnout" corresponds to a dummy variable assigned the value of 1 for earnout-based M&As, and 0 otherwise (single up-front paid M&As); "Non-Earnout" corresponds to a dummy variable assigned the value of 1 for non-earnout M&As (single up-front paid M&As), and 0 otherwise; "Cash" corresponds to a dummy variable assigned the value of 1 for fully settled M&As in cash, and 0 otherwise; "Stock" corresponds to a dummy variable assigned the value of 1 for fully settled M&As in stock, and 0 otherwise; "Mixed" corresponds to a dummy variable assigned the value of 1 for fully settled M&As in mixed payment (cash and stock), and 0 otherwise; "Private" corresponds to a dummy variable assigned the value of 1 for deals involving a private target, and 0 otherwise; "Subsidiary" corresponds to a dummy variable assigned the value of 1 for deals involving a subsidiary target, and 0 otherwise. All variables are defined in Appendix A. The statistical significance of differences in returns between groups of acquirers is tested using the t-test for equality of means. ***, **, and * indicate significance at 1%, 5%, and 10% respectively of the mean for each covariate presented. N refers to the number of observations in each portfolio/group.

Table 4. Multivariate analysis of acquirer abnormal returns

	1	2	3	4	5	6	7	8	9	10	11
Earnout	-0.190	0.432***	-0.623***	0.340**	0.976***	0.520*	-0.228	0.581**			
Relative Deal Size	0.036***	0.012	0.181***		0.203***	0.203***	0.203***	0.203***	0.413**	0.413**	0.416**
Log(MV)	-0.539	-0.685		-0.496	-0.855	-0.539	-0.539	-0.857	-0.578	-0.578	-0.576

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	***	***		***	***	***	***	***	***	***	***
Log(DV)			0.335***								
Low DV		-1.517***									
Low DV × Earnout		0.499**									
High MV			-1.433***								
High MV × Earnout			0.601**								
Low Relative Size				-0.689***							
Low Relative Size × Earnout				0.704***							
High Age					-0.386**						
High Age × Earnout					1.110***						
Target in Intangible-Rich Sector × Earnout						0.111					
Diversified × Earnout							-0.452				
Foreign × Earnout								0.601*			
Relative Earnout Value (REAV)									-1.292***	-1.505***	0.385
REAV^2										0.243***	
(REAV – 0.30) × Dummy *iff* REAV > 0.30											-2.273**
Sigma	7.462***	9.842***	4.212***	8.609***	7.825***	7.646***	7.600***	7.670***	0.205***	0.222***	0.000***
MTBV	-0.129***	-0.096***	-0.395***	-0.119***	-0.441***	-0.445***	-0.445***	-0.445***	-0.181***	-0.181***	-0.183***
Age	0.101**	0.119***	-0.052	0.114***		-0.110	-0.111	-0.110	-0.113	-0.113	-0.112
Private Target	-0.703***	-0.640***	-0.326**	-0.674***	-0.412***	-0.409***	-0.410***	-0.413***	-0.527*	-0.526*	-0.551**
Target in Intangible-Rich Sector	-0.223**	-0.191**	-0.352**	-0.201**	0.397**	0.422**	0.407**	0.408**	0.001	0.001	-0.008
Diversified	-0.111	-0.099	0.428**	-0.085	0.367**	0.373**	0.445**	0.375**	-0.222	-0.223	-0.223
Foreign	0.032	0.042	-0.427**	0.061	-0.517***	-0.501***	-0.505***	-0.615***	-0.129	-0.128	-0.133
Intercept	3.568***	4.745***	-2.264**	3.233***	-0.981	-0.322	-0.353	-0.323	-0.256	-0.231	-0.536
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer nation fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	3.27%	3.78%	2.19%	3.32%	2.08%	2.07%	2.07%	2.07%	1.59%	1.58%	1.62%
F-stat											

	87.93***	87.59***	49.80***	82.50***	55.31***	54.97***	55.03***	55.05***	7.32**	6.70**	6.84**
Min VIF	1.01	1.02	1.02	1.02	1.01	1.01	1.01	1.01	1.03	1.03	1.03
Max VIF	1.23	1.96	1.59	1.91	2.10	3.66	2.11	1.56	1.24	1.78	5.83
Mean VIF	1.10	1.34	1.25	1.30	1.27	1.53	1.28	1.18	1.10	1.21	1.89
N	31,214	31,214	31,214	31,214	31,214	31,214	31,214	31,214	5,008	5,008	5,008

The table records results from the multivariate analysis examining the wealth effects of earnout-based deals. The dependent variable consists of the announcement period market-adjusted five-day $(t-2, t+2)$ abnormal returns of acquirers which are regressed against a set of explanatory variables. Regression outputs are estimated using ordinary least squares, with the coefficients adjusted for possible heteroscedasticity using White (1980) heteroscedasticity-consistent standard errors and covariance. The "Intercept" measures the abnormal returns to acquirers after accounting for the effects of the explanatory variables included in the specification or model. "Earnout" corresponds to a dummy variable assigned the value of 1 for earnout-based M&As, and 0 otherwise (single up-front paid M&As); "Relative Deal Size" corresponds to the ratio of Deal Value to Acquirer Market Value at 20 days prior to the deal's announcement; "Log(MV)" corresponds to the natural logarithm of Acquirer Market Value at 20 days prior to the deal's announcement; "Log(DV)" corresponds to the natural logarithm of Deal Value; "Low DV" corresponds to a dummy variable assigned the value of 1 for the one-third smallest deals in the sample, and 0 otherwise; "Low Relative Size" corresponds to a dummy variable assigned the value of 1 for the one-third smallest Relative Size deals in the sample, and 0 otherwise; "High MV" corresponds to a dummy variable assigned the value of 1 for the largest one-third acquirers in the sample, and 0 otherwise; "High Age" corresponds to a dummy variable assigned the value of 1 for the oldest one-third acquirers in the sample, and 0 otherwise; "Target in Intangible-Rich Sector" corresponds to a dummy variable assigned the value of 1 for deals involving targets operating in an intangible-rich sector (i.e., Consumer Products and Services, Financials, Healthcare, Hi-Tech, Media and Entertainment, and Telecommunications), and 0 otherwise; "Diversified" corresponds to a dummy variable assigned the value of 1 for diversifying deals (the acquiring and target firms do not share the same 2-digit SIC code), and 0 otherwise (Focused deals); "Foreign" corresponds to a dummy variable assigned the value of 1 for international deals, and 0 otherwise (Domestic deals); "Relative Earnout Value (REAV)" corresponds to the relative earnout size of the deal (=earnout value/deal value); "Sigma" corresponds to the acquirer's sigma, measured by the standard deviation of the residuals in the CAPM model over the period t-256 and t-6, where t=0 is the M&A announcement day; "MTBV" corresponds to the acquiring firm's market-to-book ratio measured at 20 days prior to the deal's announcement day; "Age" corresponds to the number of days between the acquirer's first recorded day on CRSP or Datastream and the deal's announcement day; "Private Target" corresponds to a dummy variable assigned the value of 1 for deals involving a private target, and 0 otherwise. All variables are defined in Appendix A. N refers to the number of observations. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 5. Multivariate analysis of acquirer abnormal returns: The impact of financial advisors

	1	2	3	4	5	6	7	8	9	10	11	12
Earnout	-1.164*	-1.514**	0.051	-0.192	-0.134	-0.384*	-0.347	-0.518*	-0.452	-0.626	0.087	0.234
Top-Tier AFA	0.950**	0.713*										
Top-Tier AFA × Earnout		1.990**										
Top-Tier TFA			0.854**	0.704**								
Top-Tier TFA × Earnout				1.311**								
Top-Tier AFA and TFA					0.905**	0.760**						
Top-Tier AFA and TFA × Earnout						1.208**						
Boutique AFA							0.210	-0.008				
Boutique AFA × Earnout								2.097*				
Boutique TFA									-0.354	-0.516		
Boutique TFA × Earnout										1.561*		
Boutique AFA and TFA											0.009	-0.126
Boutique AFA and TFA × Earnout												1.254**

Relative Deal Size	0.302***	0.301***	0.027	0.027	0.060**	0.060**	0.099**	0.099**	0.121**	0.121**	0.068*	0.068*
Log(MV)	-0.634***	-0.634***	-0.535***	-0.538***	-0.589***	-0.590***	-0.542***	-0.543***	-0.657***	-0.657***	-0.518***	-0.518***
Sigma	95.798*	95.686*	28.186***	28.251***	22.662***	22.674***	37.029***	36.583***	67.393*	67.258*	29.459***	29.233***
MTBV	-0.463*	-0.461*	0.021	0.022	-0.061	-0.059	-0.127*	-0.130*	-0.244*	-0.246*	-0.070	-0.071
Age	-0.319	-0.322	-0.054	-0.051	-0.029	-0.029	-0.022	-0.026	-0.376*	-0.376*	-0.040	-0.039
Private Target	-1.219***	-1.211***	-1.082***	-1.085***	-0.999***	-0.999***	-1.167***	-1.158***	-1.266***	-1.260***	-1.096***	-1.088***
Target in Intangible-Rich Sector	-0.509*	-0.504*	-0.621***	-0.632***	-0.523***	-0.528***	-0.593***	-0.581***	-0.783***	-0.775***	-0.572***	-0.563***
Diversified	-0.307	-0.285	-0.199	-0.195	-0.179	-0.170	-0.172	-0.180	-0.420	-0.431	-0.176	-0.185
Foreign	-0.743**	-0.746**	-0.103	-0.108	-0.245	-0.249	0.472**	0.471**	-0.334	-0.337	-0.281*	-0.281*
Intercept	5.651***	5.661***	4.488***	4.494***	4.724***	4.729***	5.492***	5.528***	6.820***	6.862***	4.521***	4.554***
Time fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer nation fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared	2.08%	2.09%	3.43%	3.49%	3.31%	3.35%	3.37%	3.42%	1.42%	1.42%	3.14%	3.17%
F-stat	12.80***	11.97***	24.36***	22.99***	32.98***	31.05***	21.02***	19.80***	9.86***	9.20***	31.19***	29.25***
Min VIF	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Max VIF	1.83	1.83	1.60	1.60	1.73	1.73	1.68	1.68	1.55	1.55	1.65	1.65
Mean VIF	1.21	1.25	1.18	1.22	1.19	1.23	1.19	1.20	1.17	1.19	1.18	1.21
N	7,848	7,848	8,925	8,925	12,539	12,539	7,848	7,848	8,925	8,925	12,539	12,539

The table records results from the multivariate analysis examining the wealth effects of earnout-based deals. The dependent variable consists of the announcement period market adjusted five-day ($t-2, t+2$) abnormal returns of acquirers which are regressed against a set of explanatory variables. Regression outputs are estimated using ordinary least squares, with the coefficients adjusted for possible heteroscedasticity using White (1980) heteroscedasticity-consistent standard errors and covariance. The "Intercept" measures the abnormal returns to acquirers after accounting for the effects of the explanatory variables included in the specification or model. "Earnout" corresponds to a dummy variable assigned the value of 1 for earnout-based M&As, and 0 otherwise (single up-front paid M&As); "Top-Tier AFA" corresponds to a dummy variable that is assigned the value of 1 if the acquirer financial advisor is a top-tier investment bank, and 0 otherwise; "Top-Tier TFA" corresponds to a dummy variable that is assigned the value of 1 if the target financial advisor is a top-tier investment bank, and 0 otherwise; "Top-Tier AFA and TFA" corresponds to a dummy variable that is assigned the value of 1 if the acquirer and target financial advisors are top-tier investment banks, and 0 otherwise; "Boutique AFA" corresponds to a dummy variable that is assigned the value of 1 if the acquirer financial advisor is a boutique financial advisor, and 0 otherwise; "Boutique TFA" corresponds to a dummy variable that is assigned the value of 1 if the target financial advisor is a boutique financial advisor, and 0 otherwise; "Boutique AFA and TFA" corresponds to a dummy variable that is assigned the value of 1 if the acquirer and target financial advisors are boutique financial advisors, and 0 otherwise; "Relative Deal Size" corresponds to the ratio of Deal Value to Acquirer Market Value at 20 days prior to the deal's announcement; "Log(MV)" corresponds to the natural logarithm of Acquirer Market Value at 20 days prior to the deal's announcement; "Sigma" corresponds to the acquirer's sigma, measured by the standard deviation of the residuals in the CAPM model over the period t-256 and t-6, where t=0 is the M&A announcement day; "MTBV" corresponds to the acquiring firm's market-to-book ratio measured at 20 days prior to the deal's announcement day; "Age" corresponds to the number of days between the acquirer's first recorded day on CRSP or Datastream and the deal's announcement day; "Private Target" corresponds to a dummy variable assigned the value of 1 for deals involving a private target, and 0 otherwise; "Target in Intangible-Rich Sector" corresponds to a dummy variable assigned the value of 1 for deals involving targets operating in an intangible-rich sector (i.e., Consumer Products and Services, Financials, Healthcare, Hi-Tech, Media and Entertainment, and

Telecommunications), and 0 otherwise; "Diversified" corresponds to a dummy variable assigned the value of 1 for diversifying deals (the acquiring and target firms do not share the same 2-digit SIC code), and 0 otherwise (Focused deals); "Foreign" corresponds to a dummy variable assigned the value of 1 for international deals, and 0 otherwise (Domestic deals). All variables are defined in Appendix A. *N* refers to the number of observations. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 6. Addressing self-selection bias concerns using the Propensity Score Matching (PSM) method

		(1) 1-to-1 W/o Repl.	(2) 1-to-1 W/ Repl.	(3) 2-to-1 W/ Repl.	(4) 3-to-1 W/ Repl.	(5) 4-to-1 W/ Repl.	(6) 5-to-1 W/ Repl.	(7) 10-to-1 W/ Repl.
Panel A: Univariate Analysis on the Matched Sample								
All Matched	Mean	1.88***	1.98***	1.87***	1.80***	1.78***	1.77***	1.81***
	N	7,163	7,047	10,221	12,179	13,507	14,503	17,076
Earnout (1)	Mean	2.13***	2.25***	2.12***	2.07***	2.05***	2.04***	2.07***
	N	4,502	3,593	4,439	4,737	4,870	4,934	4,999
Non-Earnout (2)	Mean	1.46***	1.69***	1.69***	1.63***	1.63***	1.64***	1.70***
	N	2,661	3,454	5,782	7,442	8,637	9,569	12,077
Diff: (1) vs. (2)	Mean	0.67**	0.56**	0.43**	0.44**	0.42**	0.40**	0.37**
Panel B: Multivariate Analysis on the Matched Sample (w/out Entropy Balancing)								
Earnout		0.54**	0.62**	0.57***	0.62***	0.64***	0.62***	0.61***
Controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer nation fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared (in %)		1.74	1.87	1.62	1.64	1.64	1.59	1.57
F-stat		4.32***	4.51***	4.68***	6.01***	6.33***	6.38***	7.76***
N		7,163	7,047	10,221	12,179	13,507	14,503	17,076
Panel C: Multivariate Analysis on the Matched Sample (w/ Entropy Balancing)								
Earnout		0.60**	0.58**	0.48**	0.51***	0.52***	0.49***	0.48**
Controls		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Acquirer nation fixed effects		Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared (in %)		1.84	1.91	1.63	1.65	1.66	1.62	1.63
F-stat		3.75***	4.58***	4.06***	4.73***	4.83***	4.73***	5.15***
N		7,163	7,047	10,221	12,179	13,507	14,503	17,076

The table records results from the PSM analysis examining the wealth effects of earnout-based deals in the univariate analysis (Panel A), multivariate analysis (in the matched sample) without balancing the covariates in the matched sample (Panel B), and multivariate analysis (in the matched sample) with balancing the covariates in the matched sample based on the method developed by Hainmuller (2012) and the Stata routine developed by Hainmuller and Xu (2013) (Panel C). The dependent variable in Panels B and C consists of the announcement period market-adjusted five-day $(t-2, t+2)$ abnormal returns of acquirers which are regressed against a set of explanatory variables. Regression outputs are estimated using ordinary least squares, with the coefficients adjusted for possible heteroscedasticity using White (1980) heteroscedasticity-consistent standard errors and covariance. The "Intercept" measures the abnormal returns to acquirers after accounting for the effects of the explanatory variables included in the specification or model. "Earnout" corresponds to a dummy variable assigned the value of 1 for earnout-based M&As, and 0 otherwise (single up-front paid M&As). Control variables include: "Relative Deal Size," which corresponds to the ratio of Deal Value to Acquirer Market Value at 20 days prior to the deal's announcement; "Sigma," which corresponds to the acquirer's sigma, measured by the standard deviation of the residuals in the CAPM model over the period $t-256$ and $t-6$, where $t=0$ is the M&A announcement day; "MTBV," which corresponds to the acquiring firm's market-to-book ratio measured at 20 days prior to the deal's announcement day; "Age," which corresponds to the number of days between the acquirer's first recorded day on CRSP or Datastream and the deal's announcement day; "Private Target," which corresponds to a dummy variable assigned the value of 1 for deals involving private targets, and 0 otherwise; "Target in Intangible-Rich Sector," which corresponds to a dummy variable assigned the value of 1 for deals involving targets operating in an intangible-rich sector (i.e., Consumer Products and Services, Financials, Healthcare, Hi-Tech, Media and Entertainment, and Telecommunications), and 0 otherwise; "Diversified," which corresponds to a dummy variable assigned the value of 1 for diversifying deals (acquiring and target firms do not share the same 2-digit SIC code), and 0 otherwise (Focused deals); and "Foreign," which corresponds to a dummy variable assigned the value of 1 for international deals, and 0 otherwise (Domestic deals). All variables are defined in Appendix A. *N* stands for the number of observations. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Table 7. The market reaction to M&A announcements, and the earnout fraction (=REAV), due to change in SFAS141(R)

Model:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Cut-off year:	Post 2009	Post 2008	Post 2007	Post 2006	Post 2005	Post 2009	Post 2008	Post 2007	Post 2006	Post 2005
Dependent Variable:	CAR	CAR	CAR	CAR	CAR	REAV	REAV	REAV	REAV	REAV
Earnout	-1.295***	-1.237***	-1.118***	-1.136***	-1.136***	0.324***	0.323***	0.321***	0.322***	0.324***
Post SFAS141(R)	-1.007**	-1.108**	-1.193***	-1.124***	-1.373***	0.004***	0.004**	0.005**	0.005**	0.003**
Earnout × Post SFAS141 (R)	1.088**	0.790	0.366	0.389	0.370	0.019**	0.015	0.014	0.015	0.007
Intercept	5.771***	5.701***	5.451***	5.453***	5.170***	-0.004	-0.003	-0.002	-0.003	-0.005
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared (in %)	4.94	4.94	4.95	4.95	4.97	65.92	65.94	65.97	65.94	65.90
F-stat	93.70***	93.67***	93.90***	93.80***	94.17***	3,486***	3,488***	3,492***	3,488***	3,483***
Min VIF	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02	1.02
Max VIF	2.54	2.95	2.95	3.23	3.49	2.54	2.95	2.95	3.23	3.49
Mean VIF	1.50	1.59	1.59	1.67	1.74	1.50	1.59	1.59	1.67	1.74
N	21,637	21,637	21,637	21,637	21,637	21,637	21,637	21,637	21,637	21,637

The table records estimates from difference-in-difference tests based on the sample of US M&As. The dependent variable is the announcement period market-adjusted five-day ($t-2, t+2$) abnormal returns of acquirers (as in Eq. 2) in models (1-5) and the REAV (=ratio of earnout value to total deal consideration) in models (6-10). Regression outputs are estimated using ordinary least squares, with the coefficients adjusted for possible heteroscedasticity using White (1980) heteroscedasticity-consistent standard errors and covariance. The "Intercept" measures: in models (1-5) the average abnormal returns to acquirers after accounting for the effects of the explanatory variables included in the specification or model, and in models (6-10) the average REAV after accounting for the effects of the explanatory variables included in the specification or model, effectively the REAV in the control sample or the single up-front paid M&As. "Earnout" corresponds to a dummy variable assigned the value of 1 for earnout-based M&As, and 0 otherwise (single up-front paid M&As); "Post SFAS141(R)" corresponds to a dummy variable assigned the value of 1 for deals announced after the cut-off year, and 0 otherwise. Control variables include: "Relative Deal Size," which corresponds to the ratio of Deal Value to Acquirer Market Value at 20 days prior to the deal's announcement; "Sigma," which corresponds to the acquirer's sigma, measured by the standard deviation of the residuals in the CAPM model over the period $t-256$ and $t-6$, where $t=0$ is the M&A announcement day; "MTBV," which corresponds to the acquiring firm's market-to-book ratio measured at 20 days prior to the deal's announcement day; "Age," which corresponds to the number of days between the acquirer's first recorded day on CRSP or Datastream and the deal's announcement day; "Private Target," which corresponds to a dummy variable assigned the value of 1 for deals involving private targets, and 0 otherwise; "Target in Intangible-Rich Sector," which corresponds to a dummy variable assigned the value of 1 for deals involving targets operating in an intangible-rich sector (i.e., Consumer Products and Services, Financials, Healthcare, Hi-Tech, Media and Entertainment, and Telecommunications), and 0 otherwise; "Diversified," which corresponds to a dummy variable assigned the value of 1 for diversifying deals (the acquiring and target firms do not share the same 2-digit SIC code), and 0 otherwise (Focused deals); and "Foreign," which corresponds to a dummy variable assigned the value of 1 for international deals, and 0 otherwise (Domestic deals). *N* stands for the number of observations. ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Appendix Table A. Variable Definitions
This table defines the variables used in the empirical analysis and indicates the data source used. SDC denotes the Thomson-Reuters SDC ONE Banker database.

Variable Name	Description	Source
All	Refers to the entire sample analyzed in this paper.	SDC
Acquirer Age	Number of days between the acquirer's first recorded day on Datastream and the deal's announcement day.	Datastream
Acquirer Cash Ratio	Acquirer's ratio of total cash and cash equivalents to total assets in the quarter prior to the announcement of the deal.	Datastream
Acquirer MV	Acquirer's market value of equity (measured 20 days prior to the deal's announcement).	Datastream
Acquirer MTBV	Acquirer's ratio of market value over book value of equity (measured 20 days prior to the deal's announcement).	Datastream
Boutique AFA	Dummy = 1 if the acquiring company is advised by a boutique bank, and 0 otherwise.	SDC; as in Song et al. (2013)
Boutique TFA	Dummy = 1 if the target company is advised by a boutique bank, and 0 otherwise.	SDC; as in Song et al. (2013)
Boutique TFA and TFA	Dummy = 1 if the acquiring and the target companies are advised by boutique banks, and 0 otherwise	SDC; as in Song et al. (2013)
CAR	Acquirer Cumulative Abnormal Returns.	Equation 2
Cash	Dummy = 1 when payment is 100% cash.	SDC
Deal Value	Deal transaction value, in millions of US dollars.	SDC
Diversified	Dummy = 1 when acquirer and target do not share the same two-digit primary SIC code, and 0 otherwise.	SDC
Domestic	Dummy = 1 when acquirer and target are domiciled in the same country, and 0 when the deal involves a foreign target (= Foreign).	SDC
Earnout	Dummy = 1 when payment includes an earnout provision, and 0 otherwise (=Non-Earnout).	SDC
Earnout Value	Value of deferred payment, in millions of US dollars.	SDC
Foreign	Dummy = 1 when acquirer and target are domiciled in different countries, and 0 when the deal involves a domestic target (= Domestic).	SDC
Mixed	Dummy = 1 when the payment is a mixture of cash, stock, and/or other methods of payment, excluding earnout provisions, and 0 otherwise.	SDC
Non-Earnout	Dummy = 1 for full cash, full stock, or mixed payment without earnout provisions, and 0 when an earnout provision is included.	SDC
Private target	Dummy = 1 if the acquired company is a private one, and 0 otherwise.	SDC
Relative earnout value	Ratio of earnout value to Deal Value.	SDC
Relative Size of the deal	Ratio of Deal Value to acquirer MV at 20 days prior to the deal's announcement.	SDC & Datastream
Stock	Dummy = 1 when payment is 100% stock exchange.	SDC
Subsidiary target	Dummy = 1 if the acquired company is a subsidiary one, and 0 otherwise.	SDC
Target in Intangible-Rich Sector	Dummy = 1 when the acquired company belongs to an intangible-rich sector (Media, Retail, High Technology, Healthcare, or Telecommunications), and 0 otherwise.	SDC
Top-Tier AFA	Dummy = 1 if the acquiring company is advised by any of the following companies: Goldman Sachs, Merrill Lynch (now Bank of America Merrill Lynch), Morgan Stanley, JP Morgan, Citi/Salomon Smith Barney, Credit Suisse First Boston, Lehman Brothers (now Barclays Capital), and Lazard), and 0 otherwise.	SDC League Tables

Continued

Appendix Table A: Variable Definitions

Variable Name	Description	Source
Top-Tier TFA	Dummy = 1 if the target company is advised by any of the following companies: Goldman Sachs, Merrill Lynch (now Bank of America Merrill Lynch), Morgan Stanley, JP Morgan, Citi/Salomon Smith Barney, Credit Suisse First Boston, Lehman Brothers (now Barclays Capital), and Lazard), and 0 otherwise.	SDC League Tables
Top-Tier TFA and TFA	Dummy = 1 if the acquiring and target companies are advised by any of the following companies: Goldman Sachs, Merrill Lynch (now Bank of America Merrill Lynch), Morgan Stanley, JP Morgan, Citi/Salomon Smith Barney, Credit Suisse First Boston, Lehman Brothers (now Barclays Capital), and Lazard), and 0 otherwise.	SDC League Tables