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By *Leonidas Barbopoulos and John O.S. Wilson*

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WP N° 13-005

2nd Quarter 2013

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Abstract

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Keywords: Earnout; Methods of payment; Mergers and acquisitions; Financial institutions; Propensity score matching; Rosenbaum-bounds.

JEL Classification: G34

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[*] The authors thank Samer Adra, James Ang, Lamont Black, Matthew Cain, Santiago Carbo Valverde, Barbara Casu, Jerry Coakley, Bob DeYoung, Espen Eckbo, Scott Frame, John Goddard, Michael Goldstein, Owain ap Gwylim, Jens Hagendorff, David Marques Ibanez, Ed Kane, Donal McKillop, Phil Molyneux, Anna Sarkisyan, Bert Scholtens, Sotiris Staikouras and Larry Wall for comments and suggestions on previous drafts of this paper. The authors also thank Olga Kuzmina, Sarmistha Pal and other participants of IFABS conference (Valencia, Spain, June 2012); and Tarik Driouchi, Annita Florou, Alex Preda, and other participants at the King's College London seminar series for useful insights. Finally, we are grateful to Robert Van Ness (editor) and two anonymous referees for providing criticisms and insights that have allowed us to strengthen the paper. The usual disclaimer applies.

1. Introduction

Shareholders of bidding and target firms face valuation risk when negotiating the price and method of payment in mergers and acquisitions (M&A).[1] One way of managing, and very often mitigating, such risk is to make part of the payment contingent upon the future performance of the target firm under existing management via the utilization of an earnout contract. Under the terms of the earnout contract the selling firm receives additional future payments provided it achieves pre-specified performance requirements. The earnout involves two stages. In the first stage, the payment is delivered to the seller at the time of the M&A announcement (in the form of cash, stock, or mixed payments), while the second (normally in cash and linked to the target firm's realization of pre-specified performance goals) is delivered after a pre-determined period has elapsed following the M&A announcement. Earnout is still a relatively new and uncommon form of contract or payment method, but in recent years it has been used to finance acquisitions of private companies operating in service industries, where information asymmetry is high and the value of the firm is often dependent on the knowledge, skill, creativity, and flair of key personnel.[2]

Previous academic research uses samples of firms drawn primarily from hi-tech and other service and knowledge-based industries to investigate the determinants of earnout usage and its impact on the returns of bidding firms in the short- and long-run.[3] The use of earnout leads to significantly higher announcement period and long-run returns to bidding firm's shareholders compared to non-earnout payment methods (such as cash, stock, or mixed).[4] Higher returns are attributed to the ability of earnout to mitigate the extent of information asymmetry between merging institutions and (in the majority of cases) retain specialised human capital of the target firm, who are incentivized to maximise performance during the integration period (and thus receive the contingent payment). Upon the elimination of these issues, the likelihood of success of the M&A increases, which is reflected on the announcement period and long-run returns of the bidding firm.

[1] Valuation risk in M&A arises from information asymmetry. In order to appropriate a large proportion of any benefits arising from the transaction, each party has a strong incentive to propose a price that overvalues itself and undervalues the other party.

[2] As a proportion of M&A deals, the use of earnout has increased from approximately one per cent to three per cent since 2001. Earnout contracts have been used most extensively in the service and hi-tech industries (J.P Morgan, 2011).

[3] Earnout contracts share the risk of any mis-valuation between the bidder and the target. A target willing to accept a greater proportion of the total deal payment sends a credible signal of quality to the bidding firm and to the market more generally. Earnout can, however, be complex and give rise to substantial monitoring costs, which could offset some of the aforementioned benefits. Cain, Denis and Denis (2011) provide detailed examples on how an earnout contract is established.

[4] The results suggest that the use of earnout is associated with the length of period where there is likely to be valuation uncertainty (Cain, Denis, and Denis, 2011). Earnout financed deals yield positive announcement period and long-run returns for bidding firms' shareholders. These returns are superior to bidders in transactions financed by cash and stock, especially when targets are private or located in hi-tech and service industries (Kohers and Ang, 2000; Datar, Frankel, and Wolfson, 2001; Barbopoulos and Sudarsanam, 2012).

A large part of the market for corporate control involves M&A in which both the bidder and target are based in the financial services industry. Such transactions are often perceived as riskier, or subject to higher valuation uncertainty (due to the nature of assets held by both firms), compared to those involving non-financial firms. This is more severe when targets are private or when the merging firms are based in different segments of the financial services industry. Previous analyses of the use and impact of earnout have excluded financial institutions due to inherent differences arising from high leverage, perceived opacity and regulation.[5] As a consequence, evidence relating to the impact of earnout financing on announcement and long-run returns is not yet available for the financial services industry. This is somewhat surprising given that earnout financing appears to offer a well-calibrated mechanism towards the success of the M&A involving financial institutions. For example, the risks associated with loans and trading assets increase the level of valuation uncertainty in the financial services industry. Financial institutions tend to exhibit higher volatility of stock prices, earnings, and cash-flows compared to their non-financial counterparts (Houston and Stiroh, 2007). In banking, this is compounded by agency problems arising from high leverage (Morgan, 2002).[6] In the case of insurance companies, the uncertainties associated with the volatility of cash flows and stock prices, investment performance, and the loyalty of customers complicate asset valuations (Klumpes, 2002; Cummins and Weiss, 2010). Zhang, Cox and Van Ness (2009) discuss the sources of information opaqueness for banks and insurance companies and claim that adverse selection generated by information asymmetry specific to liabilities is more relevant to insurers. For asset management companies, client relationships are of particular importance to ensuring success. However, these client relationships are portable, and can move with particular managers (Bengtsson and Delbecque, 2011). Therefore, the retention of key personnel is essential. Overall, M&A involving financial institutions pose additional complexities for the bidding institution, both at the pre-bid (valuation and premium estimation) and during the integration (synergy realisation) periods. As a consequence, the extent to which earnout is a useful mechanism in mitigating valuation uncertainty compounded by opacity merits serious investigation. The financial services industry provides a useful laboratory for such an investigation.

[5] Outside investors may have trouble in valuing financial institutions as they do not have access to information collected by supervisors during on-site examinations.

[6] Evidence suggests that CEO certification of financial statements led to increases in the value of banks following the passing of the Sarbanes-Oxley Act. This suggests that certification reduced the opacity of bank balance sheets. No such effect was apparent for non-financial firms (Hirtle, 2006).

Against this background, we present a comprehensive analysis of the returns to bidding firms' shareholders around announcements and over the long-run (or integration period) of M&A transactions involving financial institutions when various payment methods are employed (including cash, stock, mixed, and earnout). As such this paper is the first to explore the effects of earnout financing on bidders' short- and long-run returns when both merging institutions operate in the financial services industry.[7]

We employ a two stage approach. The first stage comprises a standard univariate analysis of bidders' announcement period and long-run returns. This involves comparing the risk-adjusted returns of bidders financing deals using earnout relative to counterparts using traditional methods of payment only, such as full-cash (cash), full-stock (stock), and mixed payments (involving only cash and stock). To confirm that the results of our study are not driven by sample selection bias, we employ a propensity score matching (PSM) approach accompanied by the Rosenbaum-bounds method. This approach addresses self-selection concerns with regard to the endogeneity of the decision of financial institutions to use earnout. Specifically, the PSM approach allows us to identify identical M&A transactions which did not use earnout contracts, thus creating a counterfactual which is then compared with announcement period and long-run returns to those transactions using earnout. As such this robustness check represents a methodological contribution to the established literature.[8] To identify whether the market reacts more favourably when earnout is used around the announcement date of deals involving financial institutions compared to other industries, we compare bidders' returns from M&A involving financial institutions to those accrued to bidders from deals involving firms from the hi-tech and other service or knowledge-based industries (such as telecommunications, retail and healthcare).[9] This allows us to test, not only the statistical significance of earnout use on bidders' returns

[7] Using only deals involving financial institutions provides the opportunity to incorporate factors specific to the financial sector when assessing how the market reacts to M&A announcements and whether that reaction persists in the long-run.

[8] The PSM provides a useful robustness check to our analyses of both short- and long-run returns. For the analysis of short-run returns, a benchmark portfolio of deals that do not use earnout is selected. This is then compared to the main portfolio of deals that financed with earnout. Our long-run analysis is based on buy-and-hold-abnormal-returns (BHARs) which represents the most commonly used methodology in measuring long-run returns in event time (Ritter, 1991; Barber and Lyon, 1997; Lyon et al, 1999). The calculation of BHARs requires the product of the post-merger returns of the portfolio of interest (using earnout) and the product of the post-merger returns of a benchmark portfolio (not using earnout). Control firms for each transaction financed with earnout are determined using the PSM method. To our knowledge this is the first time that the PSM approach has been used in the M&A literature to identify the benchmark portfolio in the calculation of BHARs.

[9] Earlier studies confirm that earnout is used more commonly in deals involving firms from intangible-rich industries (Kohers and Ang, 2000). We use earnout financed M&A from such industries (hi-tech, retail, healthcare, telecommunication) as a benchmark to investigate the magnitude of the impact of earnout financing in M&A involving only financial institutions.

in M&A involving only financial institutions, but also its economic significance relative to counterparts based in other industries.[10]

The second stage of our analysis comprises a multiple regression analysis of the impact of earnout on bidders' announcement period and long-run returns, while controlling for the impact of several transaction- and merging institution-specific features (including target firm listing status, relative size of transaction, the mid-industry segments of bidding and target institutions, and foreign acquisitions deals).

The main findings of our analysis indicate that the use of earnout in M&A involving financial institutions results in significantly higher announcement period and long-run returns to bidders' shareholders, compared to deals financed with cash, stock or a mix of cash and stock payments. This is confirmed using a propensity score matching (and Rosenbaum-bounds) approach. We find that earnout interacts with several transaction- and merging institution-specific characteristics (such as the target firm's listing status, the relative size of the transaction, and the mid-industry segments of merging institutions), in determining the announcement period and long-run returns of bidders. Furthermore, the results suggest that the higher the size of the earnout contract, as a fraction of the total transaction value, the higher the announcement period and long-run returns of bidders. We also find that the announcement period gains to bidders increase when the management team of the target firm is retained. Finally, we find that the presence of earnout in M&A yields higher announcement period returns in deals involving financial institutions compared to firms from other knowledge-based industries. Our long-run analysis shows that bidders using earnout significantly outperform their non-earnout counterparts over the period of two years following the announcement.

Overall, the results presented in this paper suggest that the market reacts favourably to the use of earnout contracts in M&A involving financial institutions. Our long-run analysis also confirms the contribution of earnout in the synergy creation process during the integration period. The remainder of the paper is organised as follows. Section 2 examines the incentives relating to the choice of payment method in M&A transactions, and how such a choice affects returns to bidding institutions. Section 3 formulates testable hypotheses and outlines the methods used to conduct the empirical analysis. This section also discusses the determinants of bidders' announcement period returns. Section 4 provides a description of the data employed and discusses the main findings. Finally, Section 5 provides a conclusion.

[10] We thank Bob DeYoung, Michael Goldstein, and Bert Scholtens for this suggestion.

2. Literature

The method of payment used to pay for an M&A signals different (private) information sets regarding the bidding and target firms' valuations during the pre-bid period, as well as the value of the deal (including the M&A bid premium).[11] For the bidder in cash-financed deals, and for both the bidder and target in stock-exchanged deals, information asymmetry creates valuation uncertainty and leads them to demand a discount to the apparent value of the bidding or target firm (Myers and Majluf, 1984; Travlos, 1987; Eckbo, Giammarino and Henkel, 1990). As a consequence, announcement period returns are significantly higher in cash-financed than in stock-exchanged M&A bids, for both bidding and target firms' shareholders (Becher, 2000; Anderson, Becher and Campbell, 2004; Kiymaz, 2004; Hagendorff, Collins and Keasey, 2008; and Gupta and Misra, 2010).[12] The remainder of this section provides a brief review of relevant literature that has explored the effects of cash, stock, and earnout financing, on bidders' returns.[13]

2.1 Non-Earnout Financing

M&A transactions financed fully at the settlement date (i.e., deals which do not contain earnout) by cash, stock, or mixed (combination of cash and stock) payment are defined as non-earnout. A cash offer is usually made by bidders who attach a high value to the target firm under their control, and by so doing signal their confidence that the target firm will be of high-value during the post-merger (or integration) period (Fishman, 1989).[14] Less confident bidders could prefer instead, to use a stock-exchange or an earnout contract, which is conditional upon the current and future value of the target.[15] The opaque nature of assets held by financial institutions may reduce the bidder's confidence with respect the target's current and future

[11] Akerlof (1970) argues that buyers can find it costly to identify the accurate value of assets sold when sellers have incentives to mislead buyers by hiding (important) bad news. In an M&A setting, this could be more applicable to unlisted, or privately held targets, where there may be significant lack of information (arising from limited disclosure) of the target firm's value.

[12] Cornett and De (1991) and Becher (2009), however, show that the choice of payment method has little effect on bidder returns.

[13] DeYoung, Evanoff and Molyneux (2009) provide a comprehensive review of the accounting and market based evidence in relation to M&A involving financial institutions.

[14] A cash offer is a 'clean' and 'secure' method of financing for the target firm as it ignores both the current and future value of the bidding firm's equity. However, it is not free of problems for the bidding firm's shareholders. Since the bidding firm's shareholders do not share any of the target firm's overvaluation risk with the target firm's shareholders, any valuation error or failure of the realisation of future cash flows will rest entirely with the bidding firm's shareholders. In contrast stock payments reduce the potential valuation errors as the bidder shares any of the target firm's overvaluation risk with the target firm's shareholders during the post-merger period.

[15] Target firm shareholders are likely to prefer cash payment as it is not conditional upon the future value of merging firms. Nevertheless, target shareholders could be disadvantaged, if the M&A creates more value during the integration period than is implied in the cash offer premium.

value (and the future value of the combined entity), which leads to a preference for non-cash methods of payment.[16]

Previous literature shows that the method of payment in M&A interacts with the listing status of the target firm in shaping bidders' returns.[17] Numerous studies investigate the impact of stock financed M&A involving targets of different listing status on the announcement period returns of bidding firms (Travlos, 1987; Fuller, Netter and Stegemoller, 2002). These studies suggest that stock financing of listed targets signals the overvaluation of the bidding firm's stock, which is therefore perceived as bad news.[18] Hansen (1987) presents a theoretical model that shows common stock (due to its contingent pricing properties) reduces the valuation risk for the bidder by forcing the target firm's shareholders to share the risk of overvaluation during the post-merger period. Officer, Poulsen and Stegemoller (2009) provide evidence which suggests that bidders enjoy higher returns when paying with stock rather non-stock, and where targets are private and young firms (with extensive intangible assets and high valuation risk).

Earlier studies show that stock-financed M&A of privately held target firms force the creation of outside blockholders. This leads to more effective monitoring of the bidding firm's managerial performance during the post-merger period, which is perceived as good news (Chang, 1998; Fuller, Netter and Stegemoller, 2002; Faccio, McConnell and Stolin, 2006). Thus, bidders seeking to reduce the valuation risk arising from information asymmetry in M&A of financial institutions are more likely, ceteris paribus, to make a stock than a cash offer. Overall, the revaluation risk (which arises from information asymmetry, asset opacity, and the high volatility of cash flows and stock prices) is shared during the post-merger period between the bidding and the target institutions.[19] Therefore, it remains unclear as to whether stock financing provides the most preferable form of payment in M&A transactions involving financial institutions.

[16] This is confirmed by either small positive or negative returns to bidders' shareholders around cash-financed M&A involving financial institutions (Kiymaz, 2004; Hagendorff, Collins and Keasey, 2008).

[17] M&A bids of unlisted (private and subsidiary) targets yield higher announcement period returns to bidders' shareholders relative to bids of listed targets (Chang, 1998; Fuller, Netter, and Stegemoller, 2002 and Faccio, McConnell, and Stolin, 2006). Among others, Chang (1998) shows that the lower premiums offered to unlisted target firms' shareholders enhance bidders' announcement period gains.

[18] Target shareholders could also suspect that the bidder offers stock to capitalise on its overvalued equity (Myers and Majluf, 1984). As a result, the target firm is likely to demand a high premium to accept such a bid.

[19] Evidence suggests that bidders experience losses from M&A of listed target financial institutions financed with stock (Becher, 2000). To our knowledge, only Gupta and Misra (2010) examine bidders' gains around M&A of unlisted target financial institutions that financed with stock.

2.2 Earnout Financing [20]

Evidence relating to the impact of earnout contracts on the announcement period returns of bidding firms involved in M&A is rather limited. A small number studies utilise samples of firms from service industries (non-financial firms) to investigate the impact of earnout on the returns of bidders in the short- and long-run. Kohers and Ang (2000) show that earnout financed bids yield positive announcement period and long-run returns for bidding firms' shareholders. These returns are superior to bidders' returns in transactions financed by cash and stock (especially when targets are private and located in hi-tech and service sectors). Datar, Frankel, and Wolfson (2001) show that foreign bidders use earnout less frequently than domestic bidders. The managers of foreign target institutions appear to be unwilling to accept deferred payments owing to possible future conflicts arising from discrepancies in calculations of the payment amount and performance goals, and differences in accounting practices and other corporate governance mechanisms.[21] Barbopoulos and Sudarsanam (2012) show that UK bidders of non-financial firms using earnout experience higher announcement and long-run returns compared to other payment methods. Such benefits are greater in deals involving firms operating in industries where intangible assets are important.

Cain, Denis, and Denis (2011) examine the determinants of earnout use in M&A bids of US non-financial firms. They show that the size and the length of the earnout contract are greater when the uncertainty surrounds the value of the target firm is higher. In a recent contribution, Lukas, Reuer, and Welling (2012) examine the impact of uncertainty on the optimal timing of M&A using earnout. Based on a game-theoretic option pricing approach they show that optimal size of the earnout contract and initial payment combinations are endogenously determined.

[20] Equity derivatives, such as collars and caps provide an alternative method for reducing the valuation risk arising from the short-run share price movements of bidding or target firm. Contingent Value Rights (CVRs) are commitments by the bidder to provide additional payments, in the form of cash or securities, to the target firm's shareholders if the share price of the new entity in the integration period does not exceed a pre-specified level. Chatterjee and Yan (2008) show that: bidders' gains are higher in M&A in which CVRs are offered along with cash and stock versus all-stock. Firms facing cash contraints or greater information asymmetry are more likely to offer CVRs.

[21] Mantecon (2009) confirms the aforementioned results by showing that the use of earnout is advantageous for domestic, but not foreign bidders' shareholders.

3. Hypotheses and methods

3.1 Hypotheses

Previous studies show that the returns of bidders in the short-run are affected by a number of transaction- and merging firm-specific factors. Among others, the method of payment used to finance the M&A is found to significantly influence the returns of bidding firms.

M&A transactions involving financial institutions present greater challenges to merging institutions' managers compared to deals involving non-financial firms (given the opaque nature of the assets held by the financial institutions, the volatility of current and future cash flows and stock prices, and the degree of uncertainty over the period that the synergistic gains will be realised). This can reduce the expectations of net synergistic gains originating from the M&A, which in turn is reflected into the lower announcement period returns to bidder shareholders.

For the purposes of the current analysis, bids of unlisted financial institutions are expected to be subject to higher valuation uncertainty than bids of non-financial firms of the same listing status, given the higher volatility of cash flows experienced by financial services firms (especially in more recent times). Given its two payment structure, and its ability to motivate the retention of the target firm's managers (and thus reduce moral hazard issues), the use of earnout can contribute to a reduction in the degree of information asymmetry and valuation uncertainty in M&A involving exclusively financial institutions. Therefore, earnout can have an immediate and positive impact on the synergistic gains of the M&A, and thus yield higher announcement period returns to the bidding firm's shareholders. Our first hypothesis (stated in the alternate) is as follows:

H1: Bidders using earnout to finance M&A of financial institutions experience higher announcement period returns than counterparts using non-earnout methods of payment.

Earnout is often involved in M&A transactions involving firms from industries where the value of the assets exchanged is dependent on the human creativity of a few individuals. Similarly, earnout is used in M&A of private targets operating in a different industry to that of the bidding firm, which gives rise to the information asymmetry and valuation disagreement (valuation risk) between the merging partners. In M&A involving financial institutions, however, the valuation risk is driven, to a great extent, by the opaque nature

of assets being exchanged (Zhang, Cox and Van Ness, 2009). As a result, the estimation of the intrinsic value of the deal becomes difficult and the retention of the target firm's key personnel becomes essential. Therefore, we anticipate that the market reaction is likely to differ around M&A involving financial institutions, versus firms from other industries where earnout is used. Our second hypothesis (stated in the alternate) is as follows:

H2: Bidders using earnout to finance M&A of financial institutions experience higher announcement period returns than counterparts in other industries using earnout.

Kohers and Ang (2000) and Barbopoulos and Sudarsanam (2012) contend that earnouts guarantee the retention of the target firm's 'skilled human capital' during the post-acquisition or integration period. The same authors also contend that the earnout motivates the management of the target firm to achieve pre-specified performance related goals in order to ensure receipt of the contingent or second payment. Overall, the retention of valuable human capital is likely to reduce problems associated with integrating the merged firms in the post-merger period, and thus improve the odds of a value enhancing M&A. As a result, the earnout may significantly contribute to value creation in both the immediate post-acquisition period and in the long-run. Accordingly we expect that the post-acquisition performance of bidders involved in M&A of financial institutions using earnout to be superior to that of bidders employing other methods of financing such as cash, stock, or mixed payments. Our third and final hypothesis (stated in the alternate) is as follows:

H3: Bidders using earnout in M&A outperform counterparts using non-earnout methods of payment in the post-acquisition period.

3.2 Methods

In this section we present the methodology used to estimate bidders' announcement period and long-run returns. We also explain a propensity score matching approach augmented by the Rosenbaum-bounds method, which is used in Section 4 to assess the robustness of our central findings.

3.2.1 Measurement of Announcement Period Abnormal Returns

In general, methods used for estimating announcement period excess returns of bidders require a long estimation period. The sample used in this study includes frequent bidders. As a consequence, these methods are to some extent inappropriate. Instead we follow a number of recent studies (including Fuller, Netter, and Stegemoller, 2002; Faccio, McConnell, and Stolin, 2006) with similar sample characteristics to calculate announcement period excess returns using the market-adjusted model as follows:[22]

$$AR_{i,t} = R_{i,t} - R_{m,t} \qquad (1)$$

Where: $AR_{i,t}$ is the excess return of bidder i on day t; $R_{i,t}$ is the return of bidder i on day t measured as the percentage change in price index of bidder i; and $R_{m,t}$ is the market return defined as the percentage change of the corresponding Datastream value-weighted market index (TOTMKUS) for the United States on day *t*. The announcement period cumulative excess return is the sum of the excess returns of the 5-days (*t*-2 to *t*+2) surrounding the day of the announcement of the M&A bid, *t*, which is day 0, as outlined in Equation 2 as follows:

$$CAR_i = \sum_{t=-2}^{t=+2} (R_i - R_m)_t \qquad (2)$$

The mean announcement period abnormal returns (mean of CAR_i) of bidders is analyzed by the method of payment used to finance the deals (cash, stock, mixed, and earnout). To assess the comparative performance of bidders using earnout versus different methods of payment, we test for differences in mean returns using a *t*-test. To further test the validity of our main conclusions, we compare the mean CAR_i of the portfolio consisting of deals financed with earnout to a matched portfolio of deals using non-earnout methods of payment. The appropriate matched deals are identified using the PSM method which is validated using the Rosenbaum-bounds method (discussed in detail in section 3.2.2).

3.2.2 Propensity Score Matching (PSM)

Earnout contracts are only used in a small proportion of our large sample of M&A transactions. This raises concerns as to whether sample-selection bias reduces the reliability of our derived results and

[22] Brown and Warner (1980) suggest that adjusting for systematic risk, *beta*, does not improve the precision of the short-run abnormal returns. Hence, the use of market adjusted return does not affect the robustness of our findings. Nevertheless, we estimate the abnormal returns using the market model and incorporate a dummy variable in the multiple regression analysis to account for the impact of frequent bidders. We confirm that our results remain qualitatively similar.

conclusions. Such bias can arise if there is an endogenous relationship between the choice of the earnout and the other covariates used in our empirical analysis. To address such concerns, we need to identify a group of institutions involved in M&A deals which share similar characteristics to our sample of deals using earnout. Unfortunately, matching directly on individual covariates becomes infeasible if the number of covariates is large. Consequently, we utilise a Propensity Score Matching (PSM) approach along with the Rosenbaum-bounds method. This approach allows us to aggregate all covariates to derive a single score using a likelihood function.

Although PSM has become a popular approach in estimating casual effects in policy impact research, it has been only recently used in the finance literature (Behr and Heid, 2011; Saunders and Steffen, 2011; Carbo-Valverde, Rodriguez-Fermandez, and Kane, 2012; and Casu, Clare, Thomas, and Sarkisyan, 2012). In the current setting, the PSM approach allows us to assess whether matching, or selected, bids from the non-earnout (untreated) group of transactions shape bidders' announcement period returns differently to earnout (treated) financed bids. More specifically, we select matching M&A bids (with similar ex-ante institution- and transaction-specific characteristics) from the non-earnout group, and assess whether the announcement period and long-run returns arising from these bids differ from their earnout counterparts.

The casual effect of earnout financing is assessed by investigating what the announcement period and long-run performance of bidders that used earnout would have been if they had not used earnout in the M&A transaction. The conditional probability of earnout presence, $p(x)$, is estimated in a logistic regression based on several ex-ante institution- and transaction-specific characteristics 'x'. Therefore, the PSM approach identifies similar earnout financed M&A bids, from the non-earnout group, by matching based on the propensity score $p(x)$. This is shown in Equation 3.

$$\begin{aligned} p(x) &= pr(D=1|x) \\ 0 &\le pr(D=1|x) \le 1 \end{aligned} \tag{3}$$

Where D the event dummy equals 1 for earnout financed bids and 0 otherwise (non-earnout). The conditional probability is computed from a discrete choice model such as a logit or a probit (Rosenbaum and Rubin, 1983; Rosenbaum and Rubin, 1985; Heckman, Ichimura, and Todd, 1997).

Following previous theoretical and empirical literature we choose the variables 'x' which are likely to affect the decision of merging firms to earnout (Kohers and Ang, 2000; Cain, Denis and Denis, 2011). These

include: the age of the bidder; the size of the bidder; target firm size (or transaction value of M&A); the listing status of the target firm; the target firm's domicile; the mid-industry segments of the merging institutions; and bidder capital-to-assets ratio. We also employ the Rosenbaum-bounds (RB) method to ensure that our logistic model produces estimates that are free of any hidden-bias, or that are not sensitive to any bias caused due to omitted covariates in our logistic model (Rosenbaum, 2002).

3.2.3 Measurement of Post-Merger Period Abnormal Returns

The post-merger period excess returns of bidders are analyzed based on the buy-and-hold-abnormal-returns (BHARs) approach. This approach represents the most commonly used method to determine long-run returns in event time (Ritter, 1991; Barber and Lyon, 1997; Lyon et al, 1999). BHARs are derived as the difference between the buy-and-hold-return of an investor in the bidding company and the buy-and-hold-return of the benchmark portfolio. The benchmark portfolio is the corresponding Datastream value-weighted market index (TOTMKUS) for the US (shown in Equation 4). To ensure that the estimation of the BHARs is robust, the benchmark portfolio is also identified based on the PSM approach (shown in Equation 5).[23]

$$BHAR_{i,t} = \prod_{t=s}^{s+T}\left(1+R_{i,t}\right) - \prod_{t=s}^{s+T}\left(1+R_{m,t}\right) \quad (4)$$

$$BHAR_{i,t} = \prod_{t=s}^{s+T}\left(1+R_{i,t}\right) - \prod_{t=s}^{s+T}\left(1+R_{control\_firm,t}\right) \quad (5)$$

Both Equations (4) and (5) calculate the BHARs for a period of 12, 24, and 36 months following the month of M&A announcement. We test for difference in mean returns using a *t*-test.

3.2.4 Multiple Regression Cross-Section Analysis

We further examine the impact of earnout based on a multiple regression model, where the effects of all other factors shaping the announcement period and long-run bidders' returns are controlled simultaneously. These factors include: the bidding institution's age; the bidding institution's size; the transaction value; the relative size of the transaction; the bidding institution's growth opportunities; the target institution's listing

[23] Market values and market-to-book-ratios have been frequently used in prior research as matching criteria (Lyon et al, 1999; Mitchell and Stafford, 2000; Rau and Vermaelen, 1998; and Loughran and Vijh, 1997). Our approach uses several transaction- and firm-specific covariates are used to estimate propensity scores, which are then used in matching.

status; the mid-industry segments of the merging institutions; the target institution's domicile; the size of the earnout contract as a proportion of the total deal value (relative earnout value); the length of the earnout contract; the common equity as percentage of total assets; a variable representing the matched bids based on the PSM approach; a variable that represents a sub-group of earnout deals in which the target firm's management team is retained during the integration period; and a dummy variable representing the merger wave or the timing of M&A announcement. Two dummy variables that represent the impact of earnout in M&A involving financial institutions, and firms based in hi-tech or other service industries are also included. Table 1 provides a full definition of the variables used and their respective sources. The estimable model is:

$$CAR_i = \alpha + \sum_{i=1}^{N} X_i + \varepsilon_i \quad (6)$$

$$BHAR_i = \alpha + \sum_{i=1}^{N} X_i + \varepsilon_i \quad (7)$$

Where: CAR_i, is the announcement period cumulative abnormal return of bidders, as estimated in Equations 1 and 2; 'α' measures the announcement period excess returns to bidders' shareholders after controlling for the effects of all other covariates, denoted 'X'. BHARs are buy-and-hold-abnormal-returns of bidders as estimated in Equation 4; 'α' measures the long-run excess returns to bidders' shareholders after controlling for the effects of all other covariates, denoted 'X'. The remainder of this section provides a rationale for the inclusion of these covariates.

(Insert Table 1 near here)

Bidder Age (AGE). Age of the bidder, measured by the log of the number of days between the day of bid announcement and the date of the institution's first record is included in the Equations 6 and 7. Research suggests that investors have more information on firms with longer histories (Zhang, 2006).

Bidder Market Value (MV). Bidder size, measured by the log of the market value 4 weeks prior to the announcement of the bid, is included in Equations 6 and 7. Evidence suggests that on average, smaller bidders gain more from takeovers than their larger counterparts (Moeller, Schlingemann, and Stulz, 2004). Larger bidders could have exhausted growth opportunities. Also, managers of large corporations (suffering from hubris) are often motivated to build empires, which leads them to engage in value destroying acquisitions (Masulis, Wang, and Xie, 2007). The impact of the size of the bidder on the returns to bidders'

shareholders can also be explained in the context of the "Too Big To Fail" (TBTF) literature. Recent evidence suggests that bidders (banks) are prepared to pay higher premiums for larger deals, which is also positively associated with their estimates of the probability of becoming TBTF (Brewer and Jagtiani, 2013).

Relative Size of the Deal (RS). The relative size of the deal, measured by the ratio of deal value to the market value of the bidder is included in Equation 6. Previous literature suggests that bidders' short-run returns are positively related to the relative size of the bid (Asquith, Bruner, and Mullins, 1983; Comett and De, 1991; Houston and Ryngaert, 1994; Hagendorff, Collins, and Keasey, 2008). Related evidence suggests that financial institutions are willing to pay premiums to become too-big-to-fail (Brewer and Jagtiani, 2013).

Deal Value (DV). The log of the deal value is included in the Equations 6 and 7. Extant literature shows that the size of the bid could affect bidder's returns (Stulz, Walkling, and Song, 1990).

Earnout Value (EAV). The size of the earnout contract (measured by the earnout value, EAV) is determined by the riskiness of the M&A deal (i.e. the exposure of merging firms to risk concerning the accurate estimation of the deal value and the M&A bid premium). Cain, Denis, and Denis (2011) confirm that, on average, the size of the earnout is positively related to proxies associated with moral hazard issues. Earnout is designed to provide a solution to such issues. Moral hazard in M&A is associated with the net benefits arising from the bid, which in turn depend on the unobservable efforts of the target firms' managers in maximizing the value of the combined firm. As a consequence, earnout size should be positively related to target firm's managerial efforts towards the maximization of value of the combined firm. In our empirical setting, Relative Earnout Value **(REAV)**, which is computed as the ratio of earnout value (**EAV)** to deal value **(DV)** is included in the Equations 6 and 7 to control whether the impact of earnout size, on the likelihood of success of the M&A, is reflected in announcement and post-merger period returns.

Earnout Length (EALGTH). The length of the earnout contract is determined by the exposure of the bidding firm to several issues allied to valuation uncertainty. Earnout length should be positively related to the uncertainty exposure of bidders in valuing the target, and the uncertainty of the target firm's performance during the post-merger period. Managers that are confident of the future performance of the combined firm should be more willing to accept shorter contracts compared to their less confident counterparts (Cain, Denis, and Denis, 2011). We use the log of the length of the earnout contract as a proxy for the different risk

exposure for the bidding firm, while we test its impact on bidders' short- and long-run returns in Equations 6 and 7.

Target Management Retention (TMGT_RTN). Previous evidence suggests that the use of earnout in M&A helps in maximizing the likelihood of success. Earnout mitigates the level of information asymmetry between the buyer and the seller and motivates the retention of experienced and well-incentivized human capital from the target firm's side (Kohers and Ang, 2000; Cain, Denis and Denis, 2011). Following Kohers and Ang (2000), we identify a large number of deals using earnout where the target firm's management is retained during the integration period following the M&A. Accordingly we test directly whether the retention of the target firm's management team has a positive effect on the announcement period and long-run returns in Equations 6 and 7.

Merger Wave Dummy (MWD). Previous studies identify cyclical patterns in the level of merger activity, and claim there is a correlation with macroeconomic activity and stock market prices (Shleifer and Vishny, 2003; Bouwman, Fuller and Nain, 2009). These studies also find that M&A occurring during boom periods yield significantly higher announcement, but lower long-run returns to bidders. In order to capture the effects of the merger wave which took place in the late 1990s, we follow Schlingemann and Stulz (2007 to introduce a dummy variable (in Equations 6 and 7) that equals one for offers during the period 1998-2000.

Bidder Market-to-Book Value (MTBV). Evidence suggests that value bidders with low market-to-book values outperform glamour bidders with high market-to-book values (Rau and Vermaelen, 1998). Martin (1996) suggests that the higher likelihood of using stock to finance an acquisition is associated with the higher growth opportunity of the bidding firm. The higher MTBV of the bidder is expected to affect the use of earnout in the M&A and thus affect the returns to bidding firm's shareholders. Accordingly we test directly (in Equations 6 and 7) whether the bidding firm's MTBV has a significant impact on the short- and long-run returns of bidders.

Capital (CPTL). Many financial institutions are subject to capital requirements. In principle a financial institution's capacity to absorb unforeseen losses determines its risk (Berger, Herring, and Szego, 1995). Several ratios are commonly used to proxy for risk, including the capital-assets ratio. A high capital-assets ratio could signify that a financial institution operating over-cautiously and ignoring profitable investment opportunities. The cost of insurance against bankruptcy can be high for a financial institution with a low

capital-assets ratio, suggesting a positive association between the capital-assets ratio and performance (in Equations 6 and 7).

Diversification (DVRSFN). A dummy variable taking a value of 1 for diversifying deals (i.e. target and bidder are based in different mid-industry segments) and 0 for focused deals is included to control for the effects of diversification. Clearly, if target and bidder belong to the same mid-industrial segment, integration of the two institutions should not only be easier but the synergistic gains should be higher. However, institutions bidding for targets that operate in an unrelated business could gain from diversification, thus causing a reduction in the volatility of cash flows of the combined entity.[24] Evidence related to the performance and diversification of US financial institutions suggests that expansion into less traditional financial activities is associated with more volatile revenue streams that can offset any positive risk-spreading benefits of diversification (DeYoung and Rice, 2004; Stiroh, 2010). Schmid and Walter (2009) find that combinations of financial activities under the umbrella of one large institution leads to a conglomerate discount (albeit that combinations between commercial banks and insurers sometimes produce a significant valuation premium). Accordingly we test directly (in Equations 6 and 7) for the impact of corporate diversification on the short- and long-run returns of bidders.

The magnitude of earnout financing in M&A of financial institutions (FI). In our analysis we investigate whether earnout provides a more calibrated way of reducing the extent of valuation risk when financial institutions are involved in the M&A, relative to firms from other industries (consistent with Hypothesis 2). In doing so, we test whether the announcement period gains accrued to M&A involving only financial, versus firms from other industries where earnout is often used, are higher (given the higher levels of uncertainty associated with these deals). To perform this analysis we add (in Equation 6) two dummy variables 'FI' and 'Non-FI', and use a sample in which only earnout is used in the payment process.[25] 'FI' represents only deals of financial institutions that financed with earnout, while 'Non-FI' represents only deals of non-financial firms that financed with earnout. M&A involving non-financial firms include hi-tech, retail, healthcare and telecommunication firms.

[24] Akbulut and Matsusaka (2010) show that corporate diversification destroys value because of agency problems or internal investment distortions.

[25] Using two dummy variables within a sample which comprises only deals of financial (FI) versus non-financial (Non-FI) firms we can identify which group outperforms the other in terms of the market reaction at the announcement period. To avoid the singular matrix problem, our NFI dummy variable represents deals of retail, telecommunication, healthcare and hi-tech firms while leaving the effect of deals involving real estate firms in the constant term.

Additional dummy variables. Dummy variables that take the value of 1 (0) are included in Equations 6 and 7 to take account of: cross-border (domestic) bids (**CBD)**; private (public and subsidiary) target bids (**PRV)**; subsidiary (public and private) target bids (**SBS);** unlisted (listed) target bids (**UNL)**; earnout (non-earnout) methods of payment (**EA)**; and matched bids (non-matched bids) (**MBD).**[26]

4. Data and results

4.1 Data

The sample comprises M&A bids announced by US bidders between 1st of January 1986 and 31st December 2009, which are recorded by the Security Data Corporation (SDC) database. The SDC database records 230,067 cases of M&A bids involving US bidders of any listing status over the sample period. For an M&A bid to remain in the sample, the bidder must be a US financial institution listed in one of the main US stock market indices, while the target institution must be an institution operating in the financial sector.[27] Domestic and foreign public, private, and subsidiary targets are included in the sample. To avoid small transactions, the bidder must have a market value of at least $1 million (four weeks prior to the announcement of the transaction), while the deal value should be at least $1 million. We keep only completed deals in our sample in order to ensure that we investigate the impact of different payment methods (including earnout) in the post-merger period. To ensure that the bidder enjoys control over the target institution's assets, only M&A bids of at least 50 percent of a target institution's equity to be acquired are included. To avoid the confounding effects of multiple M&A bids, cases where more than one bid is announced by the same bidder within a 5-day window (window analyzed) are excluded. For an M&A bid to be included in the sample, the daily stock return index, inclusive of dividends, and the market value of the bidder should be available from Datastream.[28] Once all the aforementioned criteria have been satisfied, 2,973 bids remain in our sample.[29]

[26] The matched bids dummy (MBD) represents the matched deals, which are identified via the PSM method from the non-earnout, or untreated, group in our sample.

[27] For the purpose of investigating the magnitude of earnout financing in M&A involving financial institutions, versus others firms based in knowledge-based industries, we augment our sample with deals in which both the bidder and the target are based in the retail, hi-tech, healthcare, real estate, and the telecommunication sectors. Table 5, Panel F, shows the distribution of deals. This is the only part of the empirical analysis where this sample is used.

[28] Data relating to whether the target firm's management team is retained post-merger is collected from Factiva.

[29] Our final sample comprises 13 'multiple' bidders using earnout. These bidders announce 30 M&A deals in total. There are also 57 'unique' bidders that announce only one M&A deal during the sample period. On average, unique bidders are larger, younger, and

The annual distribution of M&A bids of financial institutions in our sample covers three major merger waves since the mid-1980s (see Table 2). The first merger wave of financial institutions was observed towards the late-1980s, while the second and largest wave was observed in the late-1990s. This (observed) rapid increase can be attributed to several factors, such as: the liberalization of trade and investment; deregulation of financial services sector; privatization of state-owned enterprises; relaxation of controls regarding capital mobility across many countries; and the integration of international financial markets. The most recent (third) merger wave commenced in 2003, only to stop abruptly as a result of the onset of the recent financial crisis.

(Insert Table 2 near here)

Table 2 shows the frequency of earnout use. Similar to other payment methods, the use of earnout is highly correlated with overall (total) M&A activity. Clearly, stock offers represent the preferred medium of M&A financing, while cash offers are relatively scarce by comparison. Almost 3% of M&A transactions use earnout in the financing process, while the remainder utilizes non-earnout methods of payment such as cash, stock and mixed.[30] Similar proportions of earnout activity in samples of non-financial firms are reported by earlier US research. This is somewhat surprising given the opacity and valuation uncertainty surrounding financial institutions. The high uncertainty involved in receiving a second stage payment, could make the earnout unattractive to the target firm's management team. We do note however, that the use of earnout contracts is much more prevalent in M&A involving targets (such as asset management companies) where the retention of managers with specialised skills is of crucial importance in the post-integration period. Furthermore, the average contract length is longer for financial institutions relative to their non-financial counterparts.

Table 3 provides a description of the mid-industry relatedness of merging institutions. In the majority of transactions, merging institutions share the same mid-industry segments (shown in the diagonal of the Panels

have lower MTBV-ratios than multiple bidding counterparts. Furthermore, unique bidders are involved in larger deals and deals in which a large part of the deal value is contingent on future performance. In order to conserve space, we do not report these results. However, these results are available from the authors upon request. Furthermore, we identify that 70 (= 13+57) bidders in our sample involved in M&A using earnout are also involved in 181 M&A that do not use earnout as a method of payment. Among them, 37 are unique (involved in only one deal) with the other 33 involved in 144 M&A.

[30] Previous evidence for non-financial firms also suggests that the earnout activity is particularly high in countries with strong investor protection and corporate governance standards (Anglo-Saxon legal system), whereas in foreign acquisitions the majority of earnouts are observed in transactions involving firms operating under the Anglo-Saxon legal system (Kohers and Ang, 2000). In a brief investigation of an international sample of earnout financed M&A involving financial institutions, we can confirm that the US is the most active market. We thank both James Ang and Phil Molyneux for raising this issue.

A and B). Panel C depicts the mid-industry relatedness of merging institutions involved in M&A of financial institutions that use earnout in the financing process. The use of earnout is more prevalent in the asset management, banking, and insurance mid-industry segments. Earnout contracts are more prevalent in deals involving asset management companies. This illustrates the importance of earnout as a tool in ensuring the retention of target institution's managers with specific specialized skills following the merger (Bengtsson and Delbecque, 2011).

(Insert Table 3 near here)

Table 4 (Panel A) shows that M&A bids are more common where merging institutions share the same mid-industry segment (SMIS) than different mid-industry segment (DMIS). Bids of domestic target institutions are more common compared to those of foreign targets. Table 4 (Panel A) also reveals that the majority of M&A transactions in our sample involve unlisted targets (private and subsidiary institutions) followed by M&A bids of listed targets.

(Insert Table 4 near here)

The average transaction value varies significantly between: non-earnout and earnout financed M&A bids; M&A involving listed and unlisted target firms; domestic and foreign M&A bids; and SMIS and DMIS M&A bids. On average, cash financed M&A are used in smaller deals compared to those financed with stock, mixed, and earnout payments. Within the group of stock financed deals, M&A of listed, versus unlisted target institutions, represent the highest average transaction value. The average transaction value for DMIS M&A bids is much higher, compared to SMIS counterparts irrespective of the listing status of the target institution. Similarly, the average transaction value in foreign transactions is much higher, compared to that for domestic transactions, irrespective of the listing status of the target institution.

Additional information presented in Table 4, Panel B, reveals that bidders using non-earnout methods of payment are on average much smaller than those using earnout. This contradicts previous evidence presented for non-financial firms, but nevertheless is confirmed by the lower relative size ratio of bids using earnout versus bids using other methods of payment. This finding could reflect the ability of larger bidders to convince target institution's managers to agree to the use of earnout in the M&A transaction.[31] Bidders for

[31] Larger bidders are: more likely to enjoy more power in merger negotiations; more prepared to offer higher premiums due to hubris (Roll, 1986); and more likely to maximise the probability of becoming TBTF (Brewer and Jagtiani, 2012). Large bidders are more

listed target institutions appear much larger than those bidding for unlisted targets. The average earnout value for bids of unlisted targets is much higher than for bids of listed targets.

Table 4, Panel B also highlights that the value of the earnout (i.e. earnout size) is much larger in M&A bids involving financial institutions that share different mid-industry segments (DMIS) compared to those sharing the same mid-industry segments (SMIS). The average length of the earnout contract (which is collected from LexisNexis) in M&A transactions of financial institutions is approximately three years, which is longer than the two-year period reported by previous studies of non-financial firms.[32]

4.2 Univariate Analysis of Announcement Period Returns

Table 5 reports the findings of our univariate analysis of announcement period returns. Results are presented according to: the payment used to finance the M&A; the listing status of the target institution (unlisted (which involve private and subsidiary) and listed); the domicile of merging institutions; and the mid-industry segment of the merging institutions.

M&A transactions involving financial institutions yield insignificant abnormal returns to bidders' shareholders (0.06%). This finding is clearly shaped from bids of unlisted target institutions (which yield returns of 0.99%) compared to bids of listed counterparts (which experience losses of 1.01%). Deals involving subsidiary targets (1.98%) contribute more to the latter figure than deals involving private counterparts (0.70%). Overall, we find that the listing status of the target institution and the method of payment employed to finance the M&A transaction are important factors in explaining the distribution of bidders' announcement period returns, further confirming evidence from earlier studies based on samples of non-financial firms (Chang, 1998; Fuller, Netter and Stegemoller, 2002).

Our findings suggest that M&A transactions involving financial institutions yield significantly higher returns to bidders' shareholders when earnout is employed, compared to cases when non-earnout methods of payment (such as cash, stock and mixed) are used. Specifically, when the different methods of financing are considered, bidders using earnout significantly outperform their counterparts using non-earnout methods of

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likely to have exhausted growth opportunities and thus, bidding for a private target with earnout could boost their profitability during the post-merger period.

[32] Cain, Denis, and Denis (2011) show, that while the interquartile range for the earnout period ranges from one to three years, 'the data indicate that post-merger performance is typically measured over a period of two years. Similar figures are reported by Eckbo (2009).

payment by 2.56%. This is also confirmed in our multiple regression cross-sectional analysis (discussed in Section 4.4). Overall, our findings provide strong support for our first hypothesis, which asserts higher returns to bidders' shareholders utilizing earnout to finance M&A transactions. It also confirms findings of previous studies that examine the impact of earnout on bidders' returns around M&A transactions involving non-financial firms (Kohers and Ang, 2000; Barbopoulos and Sudarsanam, 2012).

(Insert Table 5 near here)

Although our findings provide strong evidence that M&A bids of financial institutions financed with earnout add significantly more value to the portfolios of bidders' shareholders, this difference is clearly driven by bids financed with stock versus earnout. In short, M&A bids of financial institutions using stock offers experience significant losses (of -0.40%), which are composed mainly by M&A bids of listed targets that financed with stock (-1.21%). We obtain a highly significant differential of 2.94% when comparing the performance of the stock financed portfolio (-0.40%) to that constructed from earnout financed M&A bids (2.54%).[33] Bids financed with earnout also outperform counterparts using cash offers (by a differential of 1.88%).

We compare the announcement period returns of bidders' shareholders from earnout versus non-earnout (as a group and by different methods of payment) financed bids that involve unlisted (private and subsidiary together and individually) and listed targets. Bids of unlisted target institutions that financed with earnout outperform their counterparts using other forms of payment. M&A bids of private target institutions using earnout yield higher returns compared to non-earnout counterparts (when subsidiary targets are involved, only median differences are significant at the 5% level). This could be due to the ability of the earnout to reduce adverse selection and moral hazard. In fact, earnout financed bids of unlisted targets outperform those using non-earnout payments by 1.77% (which is mainly driven by M&A involving private targets). The portfolio of M&A transactions financed with earnout yields significantly higher returns compared to deals financed with cash or stock. Finally, when listed targets are involved in the M&A using earnout, no statistically significant differentials are obtained between the earnout and each of the non-earnout methods of

[33] Gupta and Misra (2010) offer similar results in their analysis of a large sample of bank mergers in which both listed and unlisted targets are involved and financed with cash and stock payment methods.

payment. This is likely to be caused by the low number of deals financed with earnout involving listed targets.[34]

The findings discussed above are clearly influenced by M&A bids of domestic target institutions and deals within the same mid-industry segment (SMIS). Previous research suggests that earnout financed M&A involving non-financial targets benefit more (in terms of announcement period returns) only when the target is based in the domestic market (Mantecon, 2009; Barbopoulos and Sudarsanam, 2012). Our results confirm that only domestic bidders' returns are significantly higher for earnout financed M&A bids. In the same context, the majority of the returns are driven from M&A bids of unlisted (financial) target institutions. M&A bids of merging institutions that are based in the SMIS and financed with earnout outperform their counterparts using other methods of payment.

To investigate whether market reacts more favourably around the announcement date to the presence of earnout in M&A involving financial institutions, we compare bidders' returns from M&A involving financial institutions to those accrued to bidders from deals involving firms from other industries in which the earnout is used. Our analysis suggests that the use of adds more value to bids involving financial institutions than counterparts based in other industries where these forms of contract are used (Table 5, Panel F). More specifically, announcement period gains from deals involving financial institutions yields significantly higher returns than deals taking place in other industries. This provides support for our second hypothesis (which contends higher gains in the presence of earnout to bidders' shareholders of financial relative to non-financial firms).

Overall, the univariate analysis shows that the use of earnout in M&A transactions involving financial institutions yield substantial returns to bidders' shareholders, which are significantly higher than the returns obtained when cash, stock, and mixed methods of payment are used. Furthermore, the returns accrued to bidders' shareholders are clearly driven by: the listing status of the target institution; the target institution's domicile; and the mid-industry segment of the merging institutions. Finally, the univariate analysis confirms that earnout adds more value for bids involving financial institutions than counterparts based in other industries.

[34] We show that in M&A involving financial institutions this is not evident. This contrasts with previous studies that find significant differences between M&A financed with earnout versus stock (Barbopoulos and Sudarsanam, 2012).

4.3 Propensity Score Matching Estimates on Announcement Period Returns

To check the robustness of the univariate results, we estimate propensity scores for the decision of the merging institutions to use earnout. This is tested via a logit model (as outlined in Section 3.2.2). The PSM is a multi-step approach involving the: estimation of propensity scores for earnout and non-earnout groups via a logistic regression; matching of the earnout group scores with non-earnout group scores; and estimation of the average influence of earnout financing versus non-earnout (matched portfolio) financing on the announcement period performance of bidders.

We estimate the propensity scores for 87 earnout and 2,886 non-earnout financed M&A bids. The results are reported in Table 6, panel A. Our findings show that earnout occurs more frequently, in M&A involving privately held target firms, and in M&A in which bidders are better capitalised financial institutions. Furthermore, earnout is used more frequently in M&A involving asset management companies, and less frequently in deals involving banks and foreign targets.[35]

(Insert Table 6 near here)

We select M&A bids from the non-earnout group based on the 1:1 Matching Ratio (MR) and perform that selection for 1%, 5%, and 10% Absolute Probability Difference (APD) between the earnout and non-earnout groups' propensity scores respectively. We also match M&A bids based on the 2:1, 3:1, 5:1, and 10:1 MRs for the same APDs. Results based on our various matching approaches are reported in Table 6, panels C to E.[36]

Panel B reports the results of the Rosenbaum-bounds (RB) test, which is based on the 1:1 MR and 1% APD (which offers the most precise matching approach). Initially, the critical RB parameter (Γ=1). At Γ = 1 (shown in Panel B) indicates no hidden bias. However, if the earnout group yields higher CAR due to unobserved variables that impact significantly on the selection decision, then the PS matched CAR will be biased. Our results suggest that doubts over the statistical significance of the estimated mean CAR (2.54%) would emerge if an unobserved covariate caused the odds of assignment to earnout group to differ by around 1.53 or 53%. This finding suggests that our logit model offers consistent and bias free estimates.

[35] The Hosmer-Lemeshow (HL) Goodness of fit test fails to reject the the null hypothesis of no evidence of a lack of fit (Prob Chi-squared = 0.2743).
[36] The MR represents the number of deals selected from the untreated (or non-earnout) group per deal in the earnout (treated) group. For example 1:1 MR matches one untreated deal to one treated deal, and or 10:1 matches ten untreated deals to one treated deal.

As highlighted previously (section 3.2.2) the PSM approach identifies matches conditioned on the propensity score $p(x)$ (and not on each ex-ante characteristic 'x'). It is therefore important to check whether the matching procedure is able to balance the distribution of all the relevant covariates across both earnout and non-earnout groups. Rosenbaum and Rubin (1985) point out that the two-sample *t*-test for comparing the distributions of the covariates' means is appropriate. Statistics are reported in Table 6, panel C. The distributions of covariates between earnout and non-earnout groups are not statistically different, further suggesting successful matching.[37]

Evidence suggests that the earnout group yields higher announcement period returns compared to the matching group based on the PSM approach, but such differences are sensitive to the MRs and the APDs (panels D and E). More specifically, the 1:1 MR approach shows that the earnout group outperforms the matching group by 2.52% in 1% APD, whereas the same differential remains strong in 3:1, 5:1 and 10:1 MRs (differentials of 1.52%, 1.72% and 1.76% respectively, all significant at 5% and 10% level).[38] These results confirm that the earnout group tends to significantly outperform the matched group.

4.4 Multiple Regression Analysis of Announcement Period Returns

Table 7 reports the findings of our multiple regression analysis which controls for several factors simultaneously in shaping bidders' returns in the announcement period. To avoid possible multicollinearity between different sets of covariates, Equation 6 is estimated in a nested form with various combinations of covariates. The results obtained from the cross-sectional analysis not only support the findings of the univariate analysis and the three hypotheses presented in Section 3.1, but also further corroborate the significant impact of the use of earnout in the determination of bidders' returns in the announcement period. The EA coefficient, (which represents the presence of earnout in the financing process of M&A) is positive and significant across all models (Models 1 to 3 and 7 to 9). This supports Hypothesis 1, which contends

[37] Only at the 5:1 and 10:1 matching ratio (MR), the mean of 'CPTL' appears different between the earnout and non-earnout groups, albeit this difference is very weak (at 10% significance level). This is unsurprising given that in the 5:1 and 10:1 MR, a large number of observations (M&A deals) from the non-earnout (untreated) group enter the matching space. When compared to the earnout group (a very concentrated group of M&A deals), the distribution of 'CPTL' covariate appears slightly different. Overall, the weak statistical significance between the differences in the distributions of 'CPTL' suggests that our matching design is efficient.

[38] The lower performance of the matched portfolio, compared to earnout M&A portfolio, is likely to be driven by the inclusion of several M&A bids in the matched portfolio that financed with all-stock. This reflects well documented evidence that all-stock offers, which are included in our non-earnout group, generate negative announcement period returns to bidders' shareholders (Myers and Majluf, 1984; Travlos, 1987; Martin, 1996).

higher announcement period returns to bidders' shareholders when earnout is used to finance M&A bids of financial institutions.

(Insert Table 7 near here)

The inclusion of EA and MBD (Models 7 to 11) further confirms the findings from the PSM approach discussed in the univariate analysis (see Section 4.3). In fact the EA coefficient is positive and significant, while the MBD coefficient is negative, supporting the view that the earnout group tends to significantly outperform the matching group, after controlling for the effects of several other variables.[39]

We divide our earnout sample of financial institutions based on the proportion of the payment contingent on future performance. By so doing, we construct the 'REAV' variable, the 'high REAV' and 'low REAV' variables (defined in Table 1 above). Deals under the category of 'high REAV' ('low REAV') are considered as high (low)-risk or more (less)-opaque (given the nature of assets held by financial institutions). In fact, the REAV increases with the uncertainty of target firm's value, or perhaps with the level of uncertainty involved in the deal's integration process (Cain, Denis, and Denis, 2011). The 'REAV' variable is positive and significant (Model 4), indicating that the larger the contingent payment, the higher the announcement period returns of bidders. This is perhaps due to the bidder sharing more risk with the target institution during the post-merger period. The size of the REAV' coefficient (0.058) appears much larger than the coefficient of the earnout dummy variable (the EA coefficient ranges from 0.019 to 0.024) (Models 1 to 4, and 7 to 9). Further analysis suggests that the magnitude of the 'REAV' coefficient is driven by the 'high REAV' variable (Model 5). Overall, our findings suggest that the presence of earnout in M&A involving financial institutions is likely to interact with the level of opacity and thus with the probability of success of the deal. These results are not affected by the stage of the merger wave during which the M&A is announced (Models 7 and 8). The analysis also confirms that the announcement period returns of bidders are significantly affected by the retention of the target firm's management in the post-merger or integration period (Model 11).

Other variables appear important in explaining bidders' announcement period returns. AGE is negative and significant, suggesting that bidders with lower information asymmetry experience lower returns. MV is

[39] As in the case of univariate analysis, the negative performance of the matched-bids group (MBD) compared to the earnout group (EA), is likely to be driven from the inclusion of several M&A bids in the matching portfolio that financed with all-stock.

negative and significant in Models 1 to 8 and 12 (albeit the significance level varies across model specifications). The negative coefficient on DV across Models 1 through 8 provides partial support to recent evidence that suggests that financial institutions are willing to pay higher premiums for large deals (Brewer and Jagtiani, 2013). PRV, SBS, and UNL appear positive and significant across all models, implying that deals involving private and subsidiary target (unlisted) generate higher returns than deals involving listed targets.

CPTL appears as positive and highly statistically significant across Models 3 to 11. This suggests that the market views better capitalised financial institutions to be in a better position to reap the benefits arising from M&A transactions. Finally, Models 12 through 14 assess the magnitude of the impact of earnout financing in M&A involving financial (FI) versus non-financial (Non-FI) firms (from the retail, hi-tech, healthcare, and telecommunication industries). The results, consistent with our univariate analysis, suggest a larger impact of earnout financing in generating returns to financial institutions after controlling for several other firm- and transaction-specific factors. This further supports our second hypothesis.

Overall, the above analysis shows that the use of earnout in M&A transactions involving financial institutions yields significant higher announcement period returns to bidders' shareholders, compared to those using non-earnout payment methods (i.e. the full payment is in cash, stock, and mixed payments). The likely elimination of target firms' valuation uncertainty during the pre-merger period in the presence of earnout reduces the possibility of overpayment, which is therefore priced as good news in the stock market. Furthermore, earnout financing of M&A involving financial institutions yields higher value to bidders' shareholders compared to deals involving firms from other industries financed with earnout.

4.4 Analysis of Long-Run Returns

Our findings based on our univariate and multivariate analyses of bidders' long-run returns (BHARs) are presented in Tables 8 and 9. Table 8 (Panel A) shows the univariate analysis results. The main findings show that bidders using earnout to finance M&A experience higher long-run returns than counterparts using non-earnout payment methods. This is only evident during the analysis of BHARs over the period of 24 months following the M&A announcement. Specifically, the differentials representing the 2-year period

examined are statistically significant, especially in earnout versus stock financed deals. Such evidence supports earlier literature and Hypothesis 3.

Table 8 (Panel B) also shows bidders' BHARs based on the Equation 5, in which the benchmark portfolio is identified via the PSM approach. As such, Panel B offers a robustness check of our results obtained and reported in Panel A (Table 8). Across all MRs and post-merger event windows analysed, bidders using earnout to finance M&A outperform those of similar characteristics (covariates) using non-earnout methods of payment. However, only when using a 24 month window the mean BHAR is statistically significant different from zero, indicating the significantly higher performance of the earnout over the non-earnout portfolio. This confirms our findings presented in Panel A, while offering a methodological contribution.

(Insert Table 8 near here)

Table 9 presents the results of our multiple regression analysis of the determinants of bidders' long-run returns. To avoid possible multicollinearity between different sets of covariates, Equation 7 is estimated in nested form with various combinations of covariates. The results obtained from the cross-sectional analysis show the positive impact of the use of earnout in M&A. The EA coefficient is positive and significant in Model 5, consistent with our univariate analysis. Over the same period, our findings indicate that high-REAV (earnout financed) deals yield positive and significant returns (Model 8). This is consistent with the view that earnout contributes in delivering superior long run returns in risky-deals.

(Insert Table 9 near here)

One of the most important findings discussed in this section is related to the impact of target firm's retained management team on bidders' long-run returns. Models 2, 6 and 10 show that in earnout financed M&A where the target firm's management team is retained, bidders' long-run synergistic gains are significantly higher compared to deals financed with non-earnout payments.

5. Conclusion

We present new evidence on the announcement period and long-run returns of a large sample of M&A involving financial institutions using various methods of payment. A univariate analysis of bidders' announcement period returns is conducted, where the returns of bidders financing bids using earnout are

compared to counterparts using traditional methods of payment. This is augmented by a propensity score matching analysis and the Rosenbaum-bounds method, where bids subject to similar characteristics from the non-earnout group are compared to the announcement period performance of bids using earnout. The results of the univariate and propensity score matching analyses suggests bidders have higher announcement period returns when using earnout. These returns are greater in takeover bids of unlisted targets, domestic targets, and where both merging institutions are based in the same mid-industry segment. We also assess whether the market reacts more favourably around the announcement date to the presence of earnout in M&A involving financial institutions versus deals involving firms from other industries in which earnout is used. The presence of earnout in M&A involving financial institutions results in higher returns to bidders than counterparts in other industries.

A multiple regression analysis assesses the impact of earnout on bidders' announcement period returns, while controlling for other transaction- and merging institution-specific characteristics. The findings suggest that the size of the earnout contract as a fraction of the total transaction value has a positive association with the announcement period returns of bidders. Bidders experience higher announcement period returns when the target firm's management team is retained in the post-merger period.

The long-run analysis shows that in the presence of earnout, shareholders enjoy significantly higher gains in the post-merger period. These returns are sensitive to several firm- and transaction-specific characteristics. The retention of the target firm's management team enhances the gains of bidders during the post-merger period. Overall, our results suggest that the presence of earnout in M&A that involve financial institutions is likely to mitigate adverse selection and moral hazard issues arising from asymmetric information problems between the merging partners (valuation risk).

References

Akbulut, E.M., and J.G. Matsusaka, 2010. 50+ Years of Diversification Announcements, *Financial Review* 45, 231-262.

Akerlof, G.A., 1970. The market for lemons: qualitative uncertainty and the market mechanism, *Quarterly Journal of Economics* 84, 488-500.

Anderson, C.W., D.A. Becher, and T.L. Campbell II, 2004. Bank mergers, the market for bank CEOs, and managerial incentives, *Journal of Financial Intermediation* 13, 6-27.

Asquith, P., R.F. Bruner, and D.W. Mullins, 1983. The gains to bidding firms from merger, *Journal of Financial Economics* 11, 121-139.

Barber, B.M., and J.D. Lyon, 1997. Detecting long-run abnormal stock returns: the empirical power and specification of test statistics, *Journal of Financial Economics* 43, 341-372.

Barbopoulos, L., and S. Sudarsanam, 2012. Determinants of earnout as acquisition payment currency and bidders' value gains, *Journal of Banking & Finance* 36, 678-694.

Becher, D.A., 2000. The valuation effects of bank mergers, *Journal of Corporate Finance* 6, 189-214.

Becher, D.A., 2009. Bidder returns and merger anticipation: evidence from banking deregulation, *Journal of Corporate Finance* 15, 85-98.

Behr, A., and F. Heid, 2011. The success of bank mergers revisited. An assessment based on a matching strategy, *Journal of Empirical Finance* 18, 117-135.

Bengtsson, E., and B. Delbecque, 2011. Revisiting the European asset management industry, *Financial Markets, Institutions & Instruments* 20, 163-190.

Berger, A., R.J. Herring, and G.P. Szego, 1995. The role of capital in financial institutions, *Journal of Banking & Finance* 19, 393-430.

Bouwman, C., Fuller, K., and A. Nain, 2009. Market Valuations and Acquisition Quality: Empirical Evidence, *Review of Financial Studies* 22, 633-679.

Brewer, E., and J.A. Jagtiani, 2013. How much did banks pay to become too-big-to-fail and to become systemically important? *Journal of Financial Services Research*, 43, 1-35.

Brown, S.J., and J.B. Warner, 1980. Measuring security price performance, *Journal of Financial Economics* 8, 205-258.

Cain, M.D., D.J. Denis, and D.K. Denis, 2011. Earnouts: a study of financial contracting in acquisition agreements, *Journal of Accounting and Economics* 51, 151-170.

Carbo, V., S.F. Rodriguez Fermandez, and E.J. Kane, 2011. Regulatory arbitrage in cross-border banking mergers within the EU, *Journal of Money, Credit and Banking* 43, forthcoming.

Casu, B., A. Clare, A. Sarkisyan, and S. Thomas, 2012. Securitization and bank performance, *Journal of Money, Credit and* Banking, forthcoming.

Chang, S., 1998. Takeovers of privately held targets, methods of payment, and bidder returns, *Journal of Finance* 53, 773-784.

Chatterjee, S., and A. Yan, 2008. Using innovative securities under asymmetric information: why do some firms pay with contingent value rights? *Journal of Financial and Quantitative Analysis* 43, 1001-1036.

Cornett, M., and S. De, 1991. Medium of payment in corporate acquisitions: evidence from interstate bank mergers, *Journal of Money, Credit, and Banking* 23, 767-776.

Cummins, D.J. and M.A. Weiss, 2010. Systemic risk and the U.S. insurance sector, *Temple University Working Paper.*

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

DeYoung, R., and T. Rice, 2004. Non-interest income and financial performance at U.S. commercial banks, *Financial Review*, 39, 101-127.

DeYoung, R., D.D. Evanoff, and P. Molyneux, 2009. Mergers and acquisitions of financial institutions: a review of the post-2000 literature, *Journal of Financial Services Research* 36, 87-110.

Eckbo, E.B., 2009. Bidding strategies and takeover premiums: a review, *Journal of Corporate Finance* 15, 149-178.

Eckbo, E.B., R.M. Giammarino, and R.L. Henkel, 1990. Asymmetric information and the medium of exchange in takeovers, *Review of Financial Studies* 3, 651-675.

Faccio, M., J.J. McConnell, and D. Stolin, 2006. Returns to acquirers of listed and unlisted targets, *Journal of Financial and Quantitative Analysis* 41, 197-220.

Fishman, M.M., 1989. Preemptive bidding and the role of the medium of exchange in acquisitions, *Journal of Finance* 44, 41-57.

Fuller, K., J. Netter, and M. Stegemoller, 2002. What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions, *Journal of Finance* 57, 1763-1793.

Gupta, A., and L. Misra, 2010. Listing effects and the private company discount in bank acquisitions, in: Lee, C.F., Lee, A. C., and J. Lee. (eds.) *Handbook of Quantitative Finance and Risk Management*. (Springer, New York).

Hagendorff, J., M. Collins, and K. Keasey, 2008. Investor protection and the value effects of bank merger announcements in Europe and the US, *Journal of Banking & Finance* 32, 1333-1348.

Hansen, R.G., 1987. A theory for the choice of exchange medium in mergers and acquisitions, *Journal of Business* 60, 75-95.

Heckman, J.J., H. Ichimura, and P.E. Todd, 1997. Matching as an econometric evaluation estimator: evidence from evaluating a job training program, *Review of Economic Studies* 64, 605-654.

Hirtle, B. 2006. Stock market reaction to financial statement certification by bank holding company CEOs. *Journal of Money, Credit and Banking*, 38, 1263-1291.

Hosmer, W.D., and S. Lemeshow, 2000. *Applied logistic regression*. Second Edition. (John Wiley & Sons, New York).

Houston, J.F., and M.D. Ryngaert, 1994. The overall gains from large bank mergers, *Journal of Banking & Finance* 18, 1155-1176.

Houston, J.F., and K.J. Stiroh, 2007. Three decades of financial sector risk, *Federal Reserve Bank of New York Staff Report*, Number 248.

J.P. Morgan, 2011. Contingent consideration. *J.P. Morgan Mergers Insight*. 4th March 2011.

Kiymaz, H., 2004. Cross-border acquisitions of US financial institutions: impact of macroeconomic factors, *Journal of Banking & Finance* 28, 1413-1439.

Klumpes, P.J.M., 2002. Incentives facing life insurance firms to report actuarial earnings: evidence from Australia and the UK, *Journal of Accounting, Auditing and Finance* 17, 237-256.

Kohers, N., and J. Ang, 2000. Earnouts in mergers and acquisitions: agreeing to disagree and agreeing to stay, *Journal of Business* 73, 445-476.

Loughran, T., and A. Vijh, 1997. Do long-term shareholders benefit from corporate acquisitions, *Journal of Finance* 52, 1765-1790.

Lukas, E., J.J. Reuer, and A. Welling, 2012. Earnout in mergers and acquisitions: A game-theoretic option pricing approach, *European Journal of Operational Research*, forthcoming.

Lyon, J., Barber, B., and C.L. Tsai, 1999. Improved methods for test of long-run abnormal stock returns, *Journal of Finance* 54, 165-201.

Mantecon, T., 2009. Mitigating risks in cross-border acquisitions, *Journal of Banking & Finance* 33, 640-651.

Martin, K.J., 1996. The method of payment in corporate acquisitions, investment opportunities, and management ownership, *Journal of Finance* 51, 1227-1246.

Masulis, R.W., C. Wang, and F. Xie, 2007. Corporate governance and acquirer returns, *Journal of Finance* 62, 1851-1889.

Mitchell, M., and E. Stafford, 2000. Managerial decisions and long-term stock price performance, *Journal of Business* 73, 287-329.

Moeller, S.B., F.P. Schlingemann, and R.M. Stulz, 2004. Firm size and gains from acquisitions, *Journal of Financial Economics* 73, 201-228.

Morgan, D.P., 2002. Rating banks: risk and uncertainty in an opaque industry, *American Economic Review* 92, 874-888.

Myers, S., and N.S. Majluf, 1984. Corporate financing and investment decisions when firms have information that investors do not have, *Journal of Financial Economics* 13, 187-221.

Officer, M.S., A.B. Poulsen, and M. Stegemoller, 2009. Target-firm information asymmetry and acquirer returns, *Review of Finance* 13, 467-493.

Rau, R.P., and T. Vermaelen, 1998. Glamour, value and the post-acquisition performance of acquiring firms, *Journal of Financial Economics* 49, 223-253.

Ritter, J., 1991. The long-run performance of initial public offerings, *Journal of Finance* 46, 197-216.

Rosenbaum, P.R., and D.B. Rubin, 1983. The central role of the propensity score in observational studies for casual effects, *Biometrika* 70, 41-55.

Rosenbaum, P.R., and D.B. Rubin, 1985. Constructing a control group using multivariate matched sampling methods that incorporate the propensity score, *American Statistician* 39, 33-38.

Rosenbaum, P.R. 2002. Observational Studies. 2nd edition. New York: Springer.

Roll, R., 1986. The hubris hypothesis of corporate takeovers, *Journal of Business* 59, 197-216.

Saunders, A., and S. Steffen, 2011. The costs of being private: Evidence from the loan market, *Review of Financial Studies* 24, 4091-4122.

Shleifer, A., and R.W. Vishny, 2003. Stock Market Driven Acquisitions, *Journal of Financial Economics* 70, 295-311.

Schmid, M.M., and I. Walter, 2009. Do financial conglomerates create or destroy economic value? *Journal of Financial Intermediation* 18, 193-216.

Stiroh, K.J., 2010. Diversification in banking, in: Berger, A.N., P. Molyneux, and J.O.S. Wilson. (eds.) *Oxford Handbook of Banking*. (Oxford University Press, Oxford).

Stulz, R.M., A.R. Walkling, and M.H. Song, 1990. The distribution of target ownership and the division of gains in successful takeovers, *Journal of Finance* 45, 817-833.

Travlos, N.G., 1987. Corporate takeover bids, method of payment, and bidding firm's stock returns, *Journal of Finance* 52, 943-963.

White, H., 1980. A heteroscedasticity-consistent covariance matrix estimator and a direct test for heteroscedasticity, *Econometrica* 48, 817-838.

Zhang, F.X., 2006. Information uncertainty and stock returns, *Journal of Finance* 61, 105-137.

Zhang, T., Larry, A.C., and A.R. Van Ness, 2009. Adverse Selection and the Opaqueness of Insurers, *Journal of Risk and Insurance* 76, 295-321.

Table 1
Variable Definitions
The table defines the variables used in the empirical analysis, and indicates the data source used. SDC denotes Thomson-Reuters SDC M&A database. With an dummy variable, a sample observation without the value of 1 has the value of 0. Age, MV, DV, EAV, CPTL, EALGTH, and RS are log transformed in subsequent regressions.

Variable Type / Name	Description	Data source
All	Refers to the entire sample analysed in this paper.	SDC
Age	Number of days between day the bidder is first recorded on Datastream and bid's announcement day.	Datastream
Market Value (MV)	Bidder's market value of equity at four weeks prior to bid's announcement, in millions dollars.	Datastream
Deal Value (DV)	Bid's transaction value, in millions dollars.	SDC
Earnout Value (EAV)	Value of earnout contract, in millions dollars (proxy for size of earnout).	SDC
Relative Size (RS)	Ratio of DV to MV.	Datastream & SDC
REAV	Ratio of EAV to DV.	SDC
MTBV	Market-to-book value of bidder equity at four weeks, and book value of equity from the most recent accounting statement, prior to bid's announcement day.	Datastream
EA length (EALGTH)	The log of the earnout period is following the bid's announcement day (in months).	LexisNexis & InvestEgate
Capital (CPTL)	The CPTL variable is computed as follows for the different types of financial institutions: (a) **Banks:** common equity / (total assets – customer liabilities on acceptances) (b) **Insurance companies:** (common equity + policyholders' equity) / total assets (c) **Other financial companies:** common equity / (total assets – custody securities).	Datastream
Foreign (CBD)	Dummy = 1 with a US bidder and non-US target, and = 0 when both bidder and target are US institutions (= Domestic).	SDC
Diversifying (DVRSFN)	Dummy = 1 when bidder and target are based in different mid-industry segments **(DMIS)**, and = 0 when both are based in the same mid-industry segment **(SMIS)** (= Focused).	SDC
Cash	Dummy = 1 when payment is 100% cash.	SDC
Stock	Dummy = 1 when payment is 100% stock exchange.	SDC
Mixed	Dummy = 1 when payment is mixture of cash, stock, and other methods of payment excluding earnout.	SDC
Earnout (EA)	Dummy = 1 when payment includes earnout in addition to cash, stock, or mixed, and = 0 otherwise (= Non-Earnout) (NEA).	SDC
Non-Earnout (NEA)	Dummy = 1 with full-cash, or full-stock, or mixed payment without EA, and = 0 when EA is included.	SDC
Private (PRV)	Dummy = 1 if target is private, and = 0 otherwise.	SDC
Public (PBL)	Dummy = 1 if target is publicly listed, and = 0 otherwise.	SDC
Subsidiary (SBS)	Dummy = 1 if target is a subsidiary institution, and = 0 otherwise.	SDC
Unlisted (UNL)	Dummy = 1 if target is unlisted i.e. private or subsidiary, and = 0 otherwise.	SDC
FI	Dummy = 1 if both merging-partners are in the Financial Sector, and = 0 otherwise.	SDC
Non-FI	Dummy = 1 if both merging-partners are not in the Financial Sector, and = 0 otherwise.	SDC
Retail (RT)	Dummy = 1 if both merging-partners are in the Retail Sector, and = 0 otherwise.	SDC
Real Estate (RE)	Dummy = 1 if both merging-partners are in the Real Estate Sector, and = 0 otherwise.	SDC
Telecommunication (TC)	Dummy = 1 if both merging-partners are in the Telecommunication Sector, and = 0 otherwise.	SDC
Healthcare (HC)	Dummy = 1 if both merging-partners are in the Healthcare Sector, and = 0 otherwise.	SDC
Hi-Tech (HT)	Dummy = 1 if both merging-partners are in the Hi-Tech Sector, and = 0 otherwise.	SDC
Low_REAV	Dummy = 1 if REAV < its median, and = 0 if the REAV >= its median.	SDC
High_REAV	Dummy = 1 if REAV > its median, and = 0 if the REAV <= its median.	SDC
Matching Bid Dummy (MBD)	Dummy = 1 if the M&A bid form the non-earnout group is matched with a M&A bid from the earnout group, based on the propensity score matching method, and = 0 otherwise.	See Table 6 Bellow
Merger Wave Dummy (MWD)	Equals 1 if the M&A announcement it taking place during the period 1998-2000, and 0 otherwise.	SDC
MGT_RTND	Equals 1 if the management team of the target firm is retained after the M&A announcement, and = 0 otherwise.	Factiva and SEC Fillings

Table 2
M&A Activity by Location and Method of Payment
The table presents the activity of M&A involving financial institutions according to the target institution's domicile (Domestic versus CBA), merging institutions mid-industry segments (DMIS and SMIS), and the currency of financing (earnout, and non-earnout which includes cash, stock and mixed payments). Table 1 provides definitions of the variables.

Year	All	Domestic	CBA	SMIS	DMIS	EA	NEA	Cash	Stock	Mixed
1986	55	54	1	49	6	0	55	9	36	10
1987	57	55	2	47	10	0	57	13	33	11
1988	32	32	0	29	3	0	32	9	18	5
1989	75	75	0	64	11	0	75	22	47	6
1990	44	44	0	37	7	0	44	16	21	7
1991	60	60	0	52	8	0	60	11	33	16
1992	118	117	1	102	16	4	114	21	64	29
1993	187	185	2	149	38	3	184	47	115	22
1994	232	232	0	198	34	5	227	61	130	36
1995	160	160	0	145	15	1	159	39	96	24
1996	155	151	4	133	22	2	153	40	94	19
1997	241	236	5	197	44	4	237	48	159	30
1998	237	232	5	188	49	8	229	32	187	10
1999	175	172	3	132	43	9	166	25	123	18
2000	146	138	8	103	43	4	142	35	82	25
2001	129	128	1	87	42	6	123	38	54	31
2002	96	94	2	69	27	4	92	33	25	34
2003	136	134	2	106	30	6	130	43	36	51
2004	137	133	4	109	28	5	132	40	32	60
2005	143	139	4	100	43	8	135	46	29	60
2006	151	146	5	100	51	3	148	64	28	56
2007	114	102	12	82	32	6	108	29	19	60
2008	63	60	3	48	15	9	54	20	17	17
2009	30	25	5	18	12	0	30	8	11	11
Total	2,973	2,904	69	2,344	629	87	2,886	749	1,489	648
%	100	97.7	2.3	78.8	21.2	2.9	97.1	25.2	50.1	21.8

Table 3
M&A Activity by Mid-Industry Segment
The table presents the mid-industry segments (where the macro-industry for all bids is 'Financial') for both bidders (vertically) and targets (horizontally). The table is divided into three panels. Panel A presents the full sample. Panel B presents only bids financed with non-earnout payment methods. Panel C presents only bids financed with earnout payment methods. The diagonal in each panel presents the number of M&A bids in the same mid-industry segment (SMIS). Other than the diagonal represents M&A bids in different mid-industry segments (DMIS).

	Alternative Financial Investments	**Asset Management**	**Banks**	**Brokerage**	**Credit Institutions**	**Diversified Financials**	**Insurance**	**Other Financials**	**Total**
Panel A: All bids									
Alternative Financial Investments	**2**	2	1	1	1	0	1	7	**15**
Asset Management	1	**30**	7	5	2	1	3	18	**67**
Banks	1	23	**1,981**	31	26	6	18	152	**2,238**
Brokerage	1	9	7	**49**	3	2	2	10	**83**
Credit Institutions	0	2	4	2	**20**	0	2	5	**35**
Diversified Financials	0	0	0	0	0	**0**	0	0	**0**
Insurance	0	9	6	11	5	0	**205**	11	**247**
Other Financials	1	11	166	13	8	4	13	**72**	**288**
Total	**6**	**86**	**2,172**	**112**	**65**	**13**	**244**	**275**	**2,973**
Panel B: Only non-earnout bids									
Alternative Financial Investments	**1**	1	1	1	0	0	0	6	**10**
Asset Management	1	**22**	7	4	1	1	2	8	**46**
Banks	1	22	**1,975**	30	21	6	15	148	**2,218**
Brokerage	1	7	7	**46**	3	2	2	10	**78**
Credit Institutions	0	2	4	2	**18**	0	2	4	**32**
Diversified Financials	0	0	0	0	0	**0**	0	0	**0**
Insurance	0	9	6	11	5	0	**188**	9	**228**
Other Financials	1	7	165	13	6	3	12	**67**	**274**
Total	**5**	**70**	**2,165**	**107**	**54**	**12**	**221**	**252**	**2,886**
Panel C: Only earnout bids									
Alternative Financial Investments	**1**	1	0	0	1	0	1	1	**5**
Asset Management	0	**8**	0	1	1	0	1	10	**21**
Banks	0	1	**6**	1	5	0	3	4	**20**
Brokerage	0	2	0	**3**	0	0	0	0	**5**
Credit Institutions	0	0	0	0	**2**	0	0	1	**3**
Diversified Financials	0	0	0	0	0	**0**	0	0	**0**
Insurance	0	0	0	0	0	0	**17**	2	**19**
Other Financials	0	4	1	0	2	1	1	**5**	**14**
Total	**1**	**16**	**7**	**5**	**11**	**1**	**23**	**23**	**87**

Table 4

Summary Statistics

Panel A presents the M&A activity by target status and method of payment, merging institutions mid-industry segments (DMIS versus SMIS), and target institution's domicile (domestic versus CBA). The sample comprises of M&A bids announced by US bidding institutions between 01/01/1986 and 31/12/2009 and recorded by the Security Data Corporation (SDC). Targets are financial institutions, private, public, and subsidiary ones, operate both in the domestic and in the foreign economy. In Panel A: *N* represents the number of deals; % of total is the proportion of the bids in this group with respect to all bids. Table 1 provides definitions of the variables.

Panel A

		All	EA	NEA	Cash	Stock	Mixed	SMIS	DMIS	Domestic	Foreign
All	*N*	2,973	87	2,886	749	1,489	648	2,359	614	2,904	69
	% of All	-	2.9	97.1	25.2	50.1	21.8	79.4	20.6	97.7	2.3
	Mean of DV (in ml $)	458.7	295.5	463.6	177.3	592.7	498.1	396.0	699.7	447.2	940.9
	Sum of DV (in bn $)	1,364	26	1,338	133	882	323	934	430	1,299	65
Unlisted Target	*N*	1,596	85	1,511	506	678	327	1,209	387	1547	49
	% of All	53.7	2.9	50.8	17.0	22.8	11.0	40.1	13.0	52.0	1.7
	Mean of DV (in ml $)	145.3	294.5	136.9	182.9	51.7	242.2	110.9	252.7	131.8	570.5
	Sum of DV (in bn $)	232	25	207	93	35	79	134	98	204	28
Listed Target	*N*	1,377	2	1,375	243	811	321	1,150	227	1357	20
	% of All	46.3	0.1	46.3	8.2	27.3	10.8	38.7	7.6	45.6	0.7
	Mean of DV (in ml $)	821.9	337.5	822.6	165.4	1,044.9	758.7	695.7	1,461.8	806.8	1,848.2
	Sum of DV (in bn $)	1,132	1	1,131	40	847	244	800	332	1,095	37

Panel B

	MV (in Mil $)		MTBV		RS		DV (in Mil $)		EA Value (in Mil $)		REAV		EA Length	
	Mean	median	Mean	median	mean	median	mean	median	mean	median	mean	median	mean	median
All	4,826.16	466.37	0.35	1.52	0.39	0.10	458.69	39.24	75.21	13.00	0.30	0.27	38.66	36.00
Domestic	4,096.20	453.09	1.30	1.51	0.36	0.11	447.23	38.23	75.46	12.33	0.30	0.27	38.66	36.00
Foreign	35,547.91	5,799.96	-39.08	2.13	1.56	0.05	940.85	156.80	54.00	54.00	0.41	0.41	0.00	0.00
SMIS	3,956.68	453.46	0.45	1.51	0.39	0.11	395.96	37.57	31.88	9.50	0.26	0.20	40.79	36.00
DMIS	8,166.72	511.08	-0.01	1.56	0.38	0.09	699.69	48.09	115.66	22.50	0.35	0.33	37.52	36.00
Unlisted	3,709.93	343.38	-0.89	1.52	0.35	0.08	145.28	23.00	76.37	11.65	0.31	0.28	38.66	36.00
Listed	6,119.91	693.72	1.74	1.52	0.43	0.14	821.94	79.02	26.25	26.25	0.08	0.08	0.00	0.00
Earnout	7,149.98	345.80	2.49	1.80	0.29	0.12	295.47	50.00	75.21	13.00	0.30	0.27	38.66	36.00
Non-Earnout	4,756.10	468.20	0.29	1.52	0.39	0.10	463.61	38.91	-	-	-	-	-	-
Cash (only non-earnout)	6,804.34	393.01	-2.27	1.43	0.32	0.09	177.25	32.10	-	-	-	-	-	-
Stock (only non-earnout)	4,053.54	503.57	0.96	1.56	0.46	0.09	592.67	39.00	-	-	-	-	-	-
Mixed (only non-earnout)	4,002.99	397.56	1.66	1.48	0.32	0.15	498.06	49.02	-	-	-	-	-	-

Table 5

Announcement Period Excess Returns of US Bidders (Offering Earnout vs. Non-Earnout Payments)

Announcement period, 5-day (*t*-2, *t*+2), abnormal returns (in percent) of all sample bidders (**Panel A**) divided by target listing status (unlisted -private and subsidiary- and listed), methods of payment (cash, shares, mixed, and earnout), the target institution's domicile (**Panels B and C**, domestic and foreign respectively), and the bidding and target institutions' mid-industry segments (**Panels D and E**, SMIS and DMIS respectively) are presented. **Panel F** presents abnormal returns (in percent) of all sample deals using only earnout in their financing process. Deals involve firms from the financial sector (FI), and from various non-financial sectors (NFI) such as the retail (RT), hi-tech (HT), healthcare (HC), telecommunications (TC) and real estate (RE). Deals are represented in a two dimension framework: the first row represents only deals involving financial firms; the second row represents various combinations of deals involving firms from the non-financial sectors; the third row combines all deals involving FI and NFI firms; and the last row represents the mean CAR differentials between the FI and the corresponding NFI groups; column 1 represents only deals involving financial firms; column 2 represents only deals from the Retail (RT) and Real Estate (RE) sectors; column 3 represents only deals from the Retail (RT), Real Estate (RE) and Telecommunication (TC) sectors; column 4 represents only deals from the Retail (RT), Real Estate (RE), Telecommunication (TC) and Healthcare (HC) sectors; and column 5 represents only deals from the Retail (RT), Real Estate (RE), Telecommunication (TC), Healthcare (HC) and Hi-Tech (HT) sectors. See Table 1 for the definitions of the variables. Abnormal returns (AR) are market adjusted returns (see Equation 1 in text). Statistical significance of the means and their differences are tested using *t*-test. *N* refers to number of observations in each portfolio.

		All	Earnout	Non-EA	Cash	Stock	Mixed	Earnout vs. Non-EA	Earnout vs. Cash	Earnout vs. Stock	Earnout vs. Mixed
Panel A: All US Bids											
	Mean	0.06	2.54***	-0.02	0.66***	-0.40***	0.08	2.56***	1.88***	2.94***	2.46***
All Bids	*t*-stat	(0.63)	(3.38)	(-0.16)	(3.55)	(-3.12)	(0.41)	(4.56)	(3.11)	(5.25)	(3.88)
	N	2,973	87	2,886	749	1,489	648				
Private	Mean	0.70***	2.17**	0.63***	0.38*	0.53***	1.14***	1.54**	1.79***	1.64**	1.03
Targets	*t*-stat	(5.04)	(2.35)	(4.53)	(1.76)	(2.74)	(3.62)	(2.37)	(2.63)	(2.36)	(1.30)
Only	*N*	1,242	60	1,182	293	632	257				
Subsidiary	Mean	1.98***	3.84***	1.84***	1.80***	1.12	2.41***	2.00	2.04	2.72*	1.43
Targets	*t*-stat	(5.54)	(2.82)	(4.98)	(3.83)	(1.33)	(2.96)	(1.44)	(1.41)	(1.79)	(0.90)
Only	*N*	354	25	329	213	46	70				
Unlisted	Mean	0.99***	2.66***	0.89***	0.98***	0.57***	1.42***	1.77***	1.68**	2.09***	1.24*
Targets	*t*-stat	(7.31)	(3.48)	(6.58)	(4.00)	(3.01)	(4.66)	(2.95)	(2.49)	(3.48)	(1.75)
Only	*N*	1,596	85	1,511	506	678	327				
Listed	Mean	-1.01***	-2.41	-1.01***	0.00	-1.21***	-1.27***	-1.40	-2.41	-1.19	-1.14
Targets	*t*-stat	(-8.02)	(-0.82)	(-7.99)	(0.01)	(-7.19)	(-4.78)	(-0.48)	(-0.83)	(-0.41)	(-0.39)
Only	*N*	1,377	2	1,375	243	811	321				
Panel B: US Bids of Domestic Target Institutions											
	Mean	0.05	2.40***	-0.03	0.69***	-0.42***	0.09	2.43***	1.71***	2.82***	2.31***
All Bids	*t*-stat	(0.48)	(3.21)	(-0.27)	(3.57)	(-3.34)	(0.41)	(4.33)	(2.77)	(5.10)	(3.66)
	N	2,904	86	2,818	714	1,472	632				
Private	Mean	0.64***	1.95**	0.58***	0.37	0.49***	1.04***	1.37**	1.58**	1.46**	0.91
Targets	*t*-stat	(4.68)	(2.14)	(4.22)	(1.49)	(2.59)	(3.25)	(2.15)	(2.31)	(2.19)	(1.15)
Only	*N*	1,217	59	1,158	287	622	249				
Subsidiary	Mean	2.09***	3.84***	1.95***	1.94***	1.13	2.50***	1.89	1.90	2.71*	1.34
Targets	*t*-stat	(5.52)	(2.82)	(4.94)	(3.78)	(1.32)	(2.98)	(1.34)	(1.26)	(1.77)	(0.84)
Only	*N*	330	25	305	194	44	67				
Unlisted	Mean	0.95***	2.51***	0.86***	1.00***	0.53***	1.35***	1.65***	1.51**	1.98***	1.16*
Targets	*t*-stat	(7.01)	(3.31)	(6.32)	(3.91)	(2.87)	(4.36)	(2.76)	(2.19)	(3.40)	(1.68)
Only	*N*	1,547	84	1,463	481	666	316				
Listed	Mean	-0.99***	-2.41	-0.98***	0.05	-1.21***	-1.18***	-1.43	-2.46	-1.20	-1.23
Targets	*t*-stat	(-7.76)	(-0.82)	(-7.73)	(0.20)	(-7.15)	(-4.44)	(-0.49)	(-0.85)	(-0.41)	(-0.42)
Only	*N*	1,357	2	1,355	233	806	316				
Panel C: US Bids of Foreign Target Institutions											
	Mean	0.62	15.07	0.41	0.04	1.54	0.02	14.66	15.03	13.53	15.05
All Bids	*t*-stat	(0.76)	-	(0.51)	(0.07)	(0.61)	(0.01)	-	-	-	-
	N	69	1	68	35	17	16				
Unlisted	Mean	2.06**	15.07	1.79*	0.53	3.02	3.31*	13.28	14.54	12.04	11.76
Targets	*t*-stat	(2.13)	-	(1.89)	(1.03)	(0.89)	(2.10)	-	-	-	-
Only	*N*	49	1	48	25	12	11				
Listed	Mean	-2.91**	-	-2.91**	-1.19	-2.02	-7.24**	-	-	-	-
Targets	*t*-stat	(-2.47)	-	(-2.47)	(-0.98)	(-0.71)	(-3.10)	-	-	-	-
Only	*N*	20	0	20	10	5	5				

Continued

Table 5 (Continued)

		All	Earnout	Non-EA	Cash	Stock	Mixed	Earnout vs. Non-EA	Earnout vs. Cash	Earnout vs. Stock	Earnout vs. Mixed
Panel D: US Bids of Same-Mid-Industry Segments (SMIS)											
All Bids	Mean	-0.02	3.56***	-0.08	0.56***	-0.46***	0.16	3.64***	3.00***	4.02***	3.40***
	t-stat	(-0.18)	(3.07)	(-0.82)	(2.57)	(-3.50)	(0.68)	(3.13)	(3.52)	(5.34)	(2.88)
	N	2,359	42	2,317	553	1,262	502				
Private Targets Only	Mean	0.56***	2.82*	0.49***	0.20	0.40**	1.05***	2.33***	2.62***	2.42***	1.77*
	t-stat	(3.84)	(1.94)	(3.43)	(0.76)	(2.13)	(2.98)	(2.71)	(2.90)	(2.76)	(1.74)
	N	966	28	938	224	519	195				
Subsidiary Targets Only	Mean	2.22***	5.39**	2.04***	2.02***	1.36	2.52***	3.35*	3.37*	4.03*	2.87*
	t-stat	(5.04)	(2.67)	(4.54)	(3.36)	(1.20)	(3.15)	(1.72)	(1.70)	(1.84)	(1.72)
	N	243	13	230	145	33	52				
Unlisted Targets Only	Mean	0.89***	3.64***	0.79***	0.92***	0.46**	1.36***	2.85***	2.72***	3.18***	2.28**
	t-stat	(6.06)	(3.07)	(5.45)	(3.17)	(2.42)	(4.16)	(3.52)	(2.86)	(4.15)	(2.43)
	N	1,209	41	1,168	369	552	247				
Listed Targets Only	Mean	-0.97***	0.52	-0.98***	-0.15	-1.18***	-1.01***	1.50	0.67	1.70	1.53
	t-stat	(-7.01)	-	(-7.01)	(-0.52)	(-6.60)	(-3.21)	-	-	-	-
	N	1,150	1	1,149	184	710	255				
Panel E: US Bids of Different-Mid-Industry Segments (DMIS)											
All Bids	Mean	0.36	1.59*	0.26	0.95***	-0.06	-0.17	1.33*	0.64	1.65*	1.76*
	t-stat	(1.55)	(1.65)	(1.10)	(2.62)	(-0.14)	(-0.35)	(1.69)	(0.73)	(1.72)	(1.76)
	N	614	45	569	196	227	146				
Private Targets Only	Mean	1.21***	1.60	1.16***	0.97*	1.14*	1.43**	0.44	0.63	0.46	0.17
	t-stat	(3.30)	(1.35)	(3.01)	(1.66)	(1.73)	(2.06)	(0.37)	(0.54)	(0.34)	(0.13)
	N	276	32	244	69	113	62				
Subsidiary Targets Only	Mean	1.45**	2.16	1.36**	1.33*	0.51	2.09	0.80	0.83	1.65	0.07
	t-stat	(2.40)	(1.23)	(2.12)	(1.84)	(0.62)	(0.94)	(0.42)	(0.44)	(0.87)	(0.02)
	N	111	12	99	68	13	18				
Unlisted Targets Only	Mean	1.28***	1.75*	1.22***	1.15**	1.07*	1.58**	0.53	0.60	0.68	0.17
	t-stat	(4.08)	(1.80)	(3.68)	(2.48)	(1.80)	(2.18)	(0.53)	(0.61)	(0.59)	(0.14)
	N	387	44	343	137	126	80				
Listed Targets Only	Mean	-1.21***	-5.33	-1.19***	0.49	-1.47***	-2.28***	-4.14	-5.82	-3.86	-3.05
	t-stat	(-3.99)	-	(-3.92)	(0.90)	(-2.85)	(-5.31)	-	-	-	-
	N	227	1	226	59	101	66				

***, **, * indicate significance at 1%, 5% and 10% respectively.

Panel F: Financial Institutions vs. Non-Financial Institutions By Method of Payment						
		Column 1: FI	Column 2: RT+RE	Column 3: RT+RE+TC	Column 4: RT+RE+TC+HC	Column 5: RT+RE+TC+HC+HT
FI	Mean	2.54***	-	-	-	-
	t-stat	(3.38)	-	-	-	-
	N	87	-	-	-	-
NFI	Mean	-	-1.49	-0.83	1.13**	1.32***
	t-stat	-	(-1.25)	(-0.66)	(2.05)	(3.41)
	N	-	27	59	301	665
All (FI+NFI)	Mean	-	1.59**	1.18*	1.45***	1.46***
	t-stat	-	(2.42)	(1.72)	(3.14)	(4.13)
	N	-	114	146	388	752
Difference: FI vs. NFI	Mean	-	4.03***	3.37***	1.41*	1.22*
	t-stat	-	(2.87)	(1.65)	(1.71)	(1.74)

***, **, * indicate significance at 1%, 5% and 10% respectively.

Table 6

Announcement Period Excess Returns of Bidders (offering Earnout vs. Matched Bids from Non-Earnout Sample using the PSM Approach)

Panel A presents the output of the logistic regression that used in the PSM technique (see Table 1 for the definition of each variable). Pseudo R-Squared is a likelihood-based measure. HL Goodness-of-Fit refers to the Hosmer and Lemeshow (2000) goodness-of-fit test on the null hypothesis that there is no difference between the 'observed' and 'predicted' values of the depended variable (i.e. there is no lack of fit). VIF is the Variance Inflation Factor which quantifies the severity of multicollinearity. Variance inflation is the reciprocal of tolerance. ***Panel B*** shows the outcome of the Rosenbaum-bounds test. ***Panel C*** presents the descriptive statistics based on the 1:1, 3:1 and 10:1 Matching Ratio (MR) only for 1% Absolute Probability Difference (APD) (see Table 1 for the definition of each variable). APD is a number between 0 and 1 that provides the allowable absolute difference of the propensity scores between the earnout and non-earnout groups. MR is a number from 1 to N for N:1 non-earnout to earnout matching. The MR represents the number of deals selected from the untreated (or non-earnout) group per deal in the earnout (treated) group. For example 1:1 or 10:1 MR matches 1 or 10 untreated deals per treated one. For each continuous variable (MV, DV, RS, Age, Capital), the mean of each of them for the corresponding treated (earnout) and untreated (non-earnout) group, as well as the differential between the treated (earnout) and the untreated (non-earnout) groups in each case is presented; statistical significance of difference in means for each variable is tested using the *t*-test of equality of means. ***Panel D*** presents the bidding firm's announcement period returns for each group (both earnout and matched/non-earnout groups). Announcement period, 5-day (*t*-2,*t*+2), abnormal returns (in percent) of all groups of bidders. Abnormal returns (AR) are market adjusted returns (see equation 1 in text).APD is a number between 0 and 1 that provides the allowable absolute difference of the propensity scores between the earnout and non-earnout groups. MR is a number from 1 to N for N:1 non-earnout to earnout matching. The MR represents the number of deals selected from the untreated (or non-earnout) group per deal in the earnout (treated) group. For example 1:1 or 10:1 MR matches 1 or 10 untreated deals per treated one. ***Panel E*** presents differentials of abnormal returns between the earnout group and each of the matched M&A-bids groups from the non-earnout sample. Statistical significance of the means and their differences are tested using *t*-test. *N* refers to number of observations in each group or portfolio.

Panel A: Logistic Regression Output	
Intercept	-4.663***
Age	-0.073
MV	0.033
DV	0.079
Private	1.215***
CBA	-2.006**
DMIS	-0.080
CPTL	0.353***
Asset Management	1.255***
Bank	-3.043***
Brokerage	-0.829
Credit Institutions	0.522
Insurance	0.054
Year Fixed Effects	Yes
Pseudo (McFadden) *R*-Squared (in %)	25.97
HL Goodness-of-fit Test	9.8690
HL Goodness-of-fit Test [Pr > Chi-Squared]	0.2743
Mean VIF	2.76
Mean Tolerance	0.59
N	2,973
Panel B: Rosenbaum Bound	
Treated Sample Mean	2.54***
N	87
Control Sample Mean (APD = 1%; MR = N:1)	0.02
N	83
Mean Difference	2.52***
RB: *p*-value of estimated difference at Γ = 1	0.0032
RB: critical value of Γ at cut-off *p* = 0.05	1.35
RB: critical value of Γ at cut-off *p* = 0.10	1.53

Table 6 (continued)

Table 6 (continued)

Panel C: EA versus NEA (Matched) Samples Statistics					
	EA (Treated Group)	NEA (Matched Group) APD = 1% MR = 1:1	NEA (Matched Group) APD = 1% MR = 3:1	NEA (Matched Group) APD = 1% MR = 5:1	NEA (Matched Group) APD = 1% MR = 10:1
Total (*N*)	87	83	240	360	550
Domestic (*N*)	86	81	236	354	541
CBA (*N*)	1	2	4	6	9
SMIS (*N*)	42	35	106	154	239
DMIS (*N*)	45	48	134	206	311
Private (*N*)	60	58	168	234	308
Subsidiary (*N*)	25	8	25	40	78
Unlisted (*N*)	85	66	193	274	386
Public (*N*)	2	17	47	86	164
Mean MV	7,150	6,118	6,741	6,171	6,500
Mean Difference (EA vs. NEA)	-	1,032	409	979	650
t-stat of difference (EA vs. NEA)	-	(0.22)	(0.11)	(0.29)	(0.21)
Mean DV	296	566	872	807	944
Mean Difference (EA vs. NEA)	-	-270	-576	-511	-648
t-stat of difference (EA vs. NEA)	-	(-0.77)	(-0.95)	(-1.00)	(-1.24)
Mean RS	0.29	0.61	0.53	0.45	0.42
Mean Difference (EA vs. NEA)	-	-0.32	-0.24	-0.16	-0.13
t-stat of difference (EA vs. NEA)	-	(-0.78)	(-0.63)	(-0.52)	(-0.50)
Mean Age	3,971	3,458	3,961	4,034	4,389
Mean Difference (EA vs. NEA)	-	513	10	-63	-418
t-stat of difference (EA vs. NEA)	-	(1.01)	(0.02)	(-0.16)	(-1.05)
Mean Capital	26.61	26.52	22.86	21.28	19.27
Mean Difference (EA vs. NEA)	-	0.09	3.75	5.33*	7.34*
t-stat of difference (EA vs. NEA)	-	(0.02)	(1.29)	(1.77)	(1.81)
Panel D: Earnout and Matching (Non-Earnout) Samples Announcement period Performance					
Earnout (**Treated**) Group — Mean	2.54***	-	-	-	-
Earnout (**Treated**) Group — *t*-stat	(3.38)	-	-	-	-
Earnout (**Treated**) Group — *N*	87	-	-	-	-
Non-Earnout (**Matched**) Group — Mean	-	0.02	1.02***	0.82***	0.78***
Non-Earnout (**Matched**) Group — *t*-stat	-	(0.03)	(2.81)	(2.71)	(3.20)
Non-Earnout (**Matched**) Group — *N*	-	83	240	360	550
Panel E: Differentials: Earnout (Treated) versus Non-Earnout (Matched) M&A-bids					
Mean Difference (**Treated** vs. **Matched**)	-	2.52***	1.52**	1.72***	1.76***
t-stat	-	(2.66)	(2.03)	(2.80)	(2.68)

***, **, * indicate significance at 1%, 5% and 10% respectively.

Table 7

Determinants of Announcement Period Returns of Bidders: A Cross Sectional Analysis

Announcement period (5-days) excess returns of bidders are regressed against a set of explanatory variables. Equation (3) is estimated using ordinary least square.

$$CAR_i = \alpha + \sum_{i=1}^{N} X_i + \varepsilon_i \quad (4)$$

The intercept (α) measures the excess returns to bidders after accounting for the effects of all explanatory variables. 'X' represents the vector of explanatory variables (see Section 3.2.4 for more details with respect the impact of each variable on bidders' returns and also Table 1 for the definitions of each variable). Models 12 to 14 represent deals financed with only earnout across the FI and Non-FI sectors. In Models 12 and 13 the Non-FI dummy represents deals in the Retail, Hi-Tech, Healthcare and Telecommunication sectors; in Model 14 the Non-FI dummy represents deals in the Retail, Hi-Tech and Telecommunication sectors. The 'Real Estate' sector is employed as the control group to avoid the singular matrix in problem in the estimation process. The standard errors are corrected for possible heteroscedasticity by using the White's (1980) heteroscedasticity consistent standard errors method.

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13	Model 14
Constant	0.022***	0.023***	0.003	0.003	0.003	0.002	0.007	0.007	0.002	-0.001	0.006	-0.001	-0.029	-0.013
AGE	-0.003**	-0.003**	-0.002	-0.002	-0.002	-0.002	-0.002	-0.002**	-0.003***	-0.003***	-0.004***	0.006*	0.004	0.004
MV	-0.002**	-0.002**	-0.001*	-0.002**	-0.002**	-0.002**	-0.001*	-0.001*				-0.010***		
DV	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001				0.002		
RS									0.001	0.001	0.001		0.009***	0.009***
MTBV	0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001**	-0.001*	-0.001*
PRV	0.015***	0.015***	0.015***	0.015***	0.015***	0.015***	0.014***	0.014***						
SBS	0.028***	0.028***	0.027***	0.028***	0.028***	0.029***	0.026***	0.026***						
UNL									0.019***	0.020***	0.019***	0.001	0.010	0.012
CBD	0.002	0.002	-0.001	-0.001	0.001	-0.002	-0.001	-0.001	-0.002	-0.002	-0.002	0.029***	0.028***	0.029***
DVRSFN	-0.001	-0.001	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	0.001			
EA	0.019***	0.024***	0.019**				0.019**	0.020**	0.019**					
EALGTH		-0.003	-0.003	-0.004	-0.003	0.002	0.003	-0.003	-0.004		-0.033*			
CPTL			0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.007***	0.006***			
REAV				0.058***							0.157**			
High_REAV					0.028***									
Low_REAV						0.002								
MWD							-0.007***	-0.007***						
MWD × EA								-0.007						
MBD									-0.009*	-0.010*	-0.004			
TMGT_RTN											0.060***			
FI												0.036***	0.033***	0.016*
Non-FI												0.012	0.013*	-0.001
F-Test	18.79***	17.03***	17.21***	17.48***	17.42***	16.67***	16.51***	15.25***	10.66***	20.66***	13.75***	3.98***	3.28***	3.20***
R^2 (adj.) in %	5.94	5.98	6.61	6.71	6.69	6.42	6.90	6.91	3.83	5.82	5.49	4.62	3.37	3.29
N	2,973	2,973	2,973	2,973	2,973	2,973	2,973	2,973	2,973	2,973	2,933	666	666	666

***, **, and * indicate significance at 1, 5, and 10 percent respectively.

Table 8

Long-run Excess Returns (Buy-and-Hold-Abnormal-Returns - BHARs) of Bidders (offering Earnout vs. Matched Non-Earnout Payments)

Bidders' post-acquisition buy-and-hold abnormal returns (BHARs) for 12 months (1 Year), 24 months (2 Years) and 36 months (3 Years) following the month of the M&A announcement are presented. BHARs are estimated based on the methods outlined in the section 3.2.3. The benchmark portfolio or the control firm in the estimation of BHARs is the market index in Equation 4 (Panel A) or derived via the PSM method in Equation 5 (Panel B). In panel B the matching portfolio is designed on the basis of 1:1, 3:1, 5:1 and 10:1 Matching Ratio (MR) only for 1% Absolute Probability Difference (APD) (see Table 1 for the definition of each variable). APD is a number between 0 and 1 that provides the allowable absolute difference of the propensity scores between the earnout and non-earnout groups. MR is a number from 1 to N for N:1 non-earnout to earnout matching. The MR represents the number of deals selected from the untreated (or non-earnout) group per deal in the earnout (treated) group. For example 1:1 or 10:1 MR matches 1 or 10 untreated deals per treated one. In both panels statistical significance of the means and their differences are tested using *t*-test. *N* refers to number of observations in each portfolio.

Panel A

		All	EA	NEA	Cash	Stock	Mixed	EA vs. NEA	EA vs. Cash	EA vs. Stock	EA vs. Mixed
1 year	Mean	-2.42	0.08	-2.49	0.47	-4.99	-0.18	2.57	-0.39	5.07	0.26
	t-stat	(-3.94)	(0.02)	(-4.05)	(0.40)	(-5.83)	(-0.14)	(0.70)	(-0.10)	(1.56)	(0.07)
	N	2,971	86	2,885	749	1,489	647				
2 years	Mean	-4.10	7.04	-4.42	-0.51	-8.01	-0.67	11.46	7.55	15.05	7.71
	t-stat	(-4.41)	(1.06)	(-4.72)	(-0.27)	(-6.45)	(-0.32)	(2.43)	(1.72)	(3.04)	(1.64)
	N	2,966	83	2,883	749	1,488	646				
3 years	Mean	-4.40	1.32	-4.56	-3.24	-4.72	-5.73	5.88	4.56	6.04	7.05
	t-stat	(-3.69)	(0.14)	(-3.81)	(-1.29)	(-2.96)	(-2.22)	(0.81)	(0.56)	(0.85)	(0.89)
	N	2,960	82	2,878	747	1,486	648				

Panel B

		MR = 1:1	MR = 1:3	MR = 1:5	MR = 1:10
1 year	Mean	7.13	5.02	2.78	4.36*
	t-stat	(1.02)	(1.30)	(0.87)	(1.66)
	N	82	237	354	549
2 years	Mean	17.60**	15.67***	12.10***	10.30***
	t-stat	(2.15)	(2.67)	(2.65)	(2.89)
	N	79	228	339	518
3 years	Mean	1.80	7.14	7.32	6.19
	t-stat	(0.13)	(0.89)	(1.16)	(1.36)
	N	76	223	331	516

Table 9

Determinants of Long-Run Returns (BHARs) of Bidders: A Cross Sectional Analysis

Regression of long-run returns to bidders on explanatory variables. Bidders' post-acquisition buy-and-hold abnormal returns for 12 months, 24 months and 36 months following the month of the M&A announcement are regressed on a set of explanatory variables using Equation 6 (see Section 3.2.4 for more details with respect the impact of each variable on bidders' returns and also Table 1 for the definitions of each variable). In Models 1–4 (5–8) [9–12], the dependent variable is 12 (24) [36] month BHARs. Equation (6) is estimated using ordinary least square.

$$BHAR_i = \alpha + \sum_{i=1}^{N} X_i + \varepsilon_i \quad (6)$$

The intercept (α) measures the excess returns to bidders after accounting for the effects of all explanatory variables. 'X' represents the vector of explanatory variables (see Section 3.2.2 for more details with respect the impact of each variable on bidders' returns and also Table 1 for the definitions of each variable).

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
Constant	0.060	0.066	0.054	0.054	0.160*	0.174*	0.138	0.0148*	0.255**	0.281**	0.240**	0.249**
AGE	0.001	0.001	0.001	0.001	-0.001	-0.001	-0.001	-0.001	-0.013	-0.016	-0.013	-0.014
MV	-0.005	-0.005	-0.005	-0.005	-0.008	-0.008	-0.007	-0.007	-0.012	-0.011	-0.012	-0.012
DV	-0.008	-0.008	-0.008	-0.008	-0.019**	-0.019**	-0.018**	-0.018**	-0.014	-0.016*	-0.013	-0.014
MTBV	0.001*	0.001*	0.001*	0.001*	0.001	0.001	0.001	0.001	0.001*	0.001*	0.001*	0.001*
UNL	-0.034*	-0.034*	-0.031*	-0.032*	-0.086**	-0.087**	-0.077**	-0.080**	-0.108**	-0.112**	-0.105**	-0.106**
CBD	0.091*	0.091*	0.087*	0.088*	0.049	0.050	0.035	0.040	-0.018	-0.018	-0.024	-0.022
DVRSFN	0.003	0.002	0.006	0.005	0.001	0.001	0.007	0.004	0.001	0.002	-0.001	0.002
EA	0.043				0.165**				0.106			
EALGTH	0.001				0.008				0.006			
CPTL	-0.005	-0.005	-0.002	-0.003	-0.012	-0.013	-0.003	-0.006	0.010	0.011	0.013	0.013
MBD			-0.024				0.015				0.101	
High_REAV				0.008				0.013*				0.112
TMGT_RTN		0.141*				0.259**				0.314**		
F-Test	1.75*	2.28**	1.96**	1.82*	3.21***	3.50***	2.59***	2.97***	3.06***	3.92***	3.35***	3.27***
R^2 (adj.) in %	0.65	0.78	0.68	0.67	1.29	1.19	0.97	1.07	0.96	1.33	1.22	1.29
N	2,973	2,933	2,973	2,973	2,973	2,933	2,973	2,973	2,973	2,933	2,973	2,973

***, **, and * indicate significance at 1, 5, and 10 percent respectively.

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