Information Production and Value Certification in Financial Intermediation: The Effects of Stapled Finance[1]

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Abstract

Judicial criticism of stapled financing — a financial contracting innovation that improves the credibility of value certification by informed intermediaries in M&A but raises concerns on their conflicted interests — exemplifies the tension that arises when financial intermediaries perform both an information production and a financing function. Using hand-collected data on the buyouts of U.S. public firms by private acquirers during 2002-2011, and addressing endogeneity issues, we find that stapled financing has significant positive effects on seller shareholder wealth and especially improves the prices for sellers that suffer from greater adverse selection. Moreover, stapled financing has significant positive certification effects for the debt structure and loan costs of takeover financing. However, banks offering stapled financing obtain higher commission rates in their success fees. In designing the stapled financing contracts, financial intermediaries therefore trade off ex post lending efficiency against higher expected advisory fees.

Keywords Stapled finance, Financial intermediation, Information production, Advisory fees, Endogeneity

JEL classification codes: G34, G24, G14

1 Introduction

Uncertainty regarding the value of targets' (or sellers') assets is an important characteristic of the acquisitions process. Financial intermediaries, such as investment banks, play a major *certification* role by producing and disseminating valuation related information or signals (Leland and Pyle, 1977; Diamond, 1984; Allen, 1990) and lowering the transactions costs from incomplete information.[1] A crucial issue, of course, is the credibility of the value signals generated by intermediaries. The literature emphasizes preserving (or acquiring) reputation as a disciplining mechanism for financial intermediaries against the temptation of strategically manipulating their certification role.[2] However, reputation costs may generally not resolve the credibility of information generation by intermediaries. The transactions costs based contracting approach (Coase, 1937; Williamson, 1975) then suggests that intermediaries will have incentives for *contractual innovation:* To reduce value uncertainty by designing novel financial contracts that strengthen the credibility of their value signals, facilitate the acquisitions process, and earn higher fees from the acquisitions process.

Stapled financing, where the seller pre-arranges a financing commitment from its advisors (investment banks) as an option for potential buyers, is a relatively recent financial innovation — being introduced only around the beginning of the last decade — that has played a significant role in M&A during the leveraged buyout (LBO) boom in 2004-2007 and in the financial crisis of 2009 — when outside funding dried up for many of the major deals.[3] Stapled financing is, thus, a *commitment* that is provided publicly ex ante (or at the start of the sale process) at the discretion of an informed intermediary (see Section 2). Moreover, this commitment is costly for the bank because buyers (or the winning bidders) will only exercise the financing option if they can not find better lending terms elsewhere so that the bank will likely suffer expected lending losses (Povel and Singh, 2010). Hence, the standard signaling framework (Spence, 1973; Riley, 1979) suggests that the stapled financing offer — and the financing details contained therein — can send credible public signals on the sellers' value (see Section 2).

[1] In fact, incomplete information and the role of information production by financial intermediaries play a major role in any transaction that involves sale of ownership; not surprisingly, then, these issues have often been examined in the IPO context.

[2] There is an extensive literature that examines empirically the role of investment bank reputation and the security valuation, largely in the IPO context. This literature includes Logue (1973), Beatty and Ritter (1986), Tinic (1988), Carter and Manaster (1990), and Nanda and Yun (1997).

[3] Originally, the proposed terms of the financing package were usually distributed with (or stapled to) the offering memorandum distributed to bidders in the auction. See Povel and Singh (2010) for a description of the institutional details on stapled financing.

Indeed, sellers in the M&A process appear to have understood the credible certification role of stapled financing and formed expectations of higher sale prices. For example, in the acquisition of CDW Corporation by Providence Equity Partners the discussion among the board members of CDW (available from the proxy filings PREM14 filed on July 2, 2007) highlights the board's appreciation of the signaling role of stapled financing: "The providing of stapled financing would [also] underscore that a third party had confidence in the expected performance of the company. This would likely encourage bidders to put forward higher bids than they might otherwise have submitted in an initial round of bidding."

However, stapled financing also appears to have aggravated concerns about conflicts of interest of financial intermediaries, namely, that for the sake of capturing lucrative financing fees the intermediary has the incentive to direct the bidding process towards buyers that would use the financing rather than towards buyers that would offer the highest bid. The concerns are highlighted by the 2010 lawsuit filed by public shareholders of Del Monte Food Company against the company *and* its financial advisor Barclays Capital in a Delaware court during the company's proposed acquisition by a group of private equity investors. Shareholders of Del Monte alleged that Barclays, which had offered stapled financing, suffered a conflict of interest in favoring buyers who would exercise the financing option. The court strongly criticized the practice of stapled financing in its ruling, which "sent chills through the investment banking community" with the banks "being cautious and reviewing practices around stapled financing" (Chon and Das, 2011).[4]

The use of stapled financing, already controversial and subject to judicial criticism, is likely to suffer further litigation and may well emerge as a policy issue for regulators. In fact, the controversy on stapled financing exemplifies the tension that arises when financial intermediaries perform both an information production and a financing function.[5] It is important, therefore, to examine whether stapled financing actually has significant value certification effects. However, the academic literature on stapled financing is just beginning to emerge. To our knowledge, there is no available empirical analysis of the net effects of stapled financing on the shareholders of sellers; in particular, there is no empirical examination of the economic significance of the information production and value certification in stapled financing.[6]

[4] Barclays and Del Monte settled the case in one of the largest settlements in a M&A transaction. This case also marks a rare instance of a lawsuit against the investment banker rather than the company during such a transaction.

[5] This tension occurs in many settings and has sometimes led to far-reaching regulation to separate the two functions, as for example in the Glass-Steagall Act that separated corporate securities underwriting forom lending by commercial banks (see, e.g., Puri, 1996).

[6] The literature has only recently begun to study specific aspects of stapled financing. For example, Boone and

Using a unique hand-collected dataset on the LBOs of U.S. public firms by private acquirers during 2002-2011 with detailed information on the bidding process and pricing outcomes of stapled versus non-stapled deals, we examine the signaling or value certification effects of stapled financing. Our sample selection is informed by the consideration that financing commitments by intermediaries are most economically relevant to large acquisition deals with private acquirers because public acquirers have access to other funding sources.[7] On the other hand, the fact that LBOs tend to be larger, older, and more levered compared with targets in public acquisitions (e.g., Bargeron et al., 2008) raises the question whether information asymmetry — necessary for a significant certification role of stapled financing — is a major issue for them. Interestingly, we find substantial heterogeneity in our sample with respect to the information asymmetry based on proxies that are typically used in the literature; thus, targets in many LBOs appear to face significant public valuation uncertainty due to asymmetric information. Moreover, sellers receiving stapled finance packages exhibit greater information asymmetry and have larger financing needs compared with the non-stapled-finance targets, which is consistent with the view that stapled financing is offered when there are higher benefits ex ante from value certification. .

However, analyzing the effects of stapled financing on target shareholders' wealth during the acquisitions process poses challenging identification problems. This is because the decision to provide stapled financing is endogenous and may depend on non-observable factors that are also correlated with the abnormal returns received by target shareholders during the acquisition; indeed, this is quite likely because of the information asymmetry that typically exists between insiders — the sellers and their financial advisors — and outsiders (or the buyers) in takeovers. This omitted variables problem may render inconsistent inference on the effects of stapled financing. To address these concerns, and to reliably estimate the effects of stapled financing, we use an endogenous switching regressions model, which is a generalization of the classical Heckman (1979) two-stage procedure, to pose "what-if" questions on important effects of stapled financing, such as: Given a stapled financing deal, what would have been the abnormal returns for target shareholders without the financing commitment and, conversely, for the a deal without stapled financing? By further

Mulherin (2008) and Povel and Singh (2010) examine the effects of stapled financing on the intensity of bidding competition.

[7] We obtain information on the stapled financing contracts through news sources and proxy filing. Subject to sample filters that are standard in the LBO literature, our final sample of 54 staple financed deals and 177 deals without staple finance represents the entire sample of LBOs of public firms by private aqcuirers from January 2002 through June 16, 2011. Section 3 provides more detailed descriotion of the sample selection procedure.

undertaking this analysis for targets subject to high or low information asymmetry and with respect to the terms of buyout financing packages, we provide estimates of the pricing and financing cost improvement from the certification effects of stapled financing.

We find that stapled financing has significantly positive effects on the wealth of sellers' shareholders. Without controlling for endogeneity effects, but controlling for target- and deal-specific factors that are usually considered in M&A event studies (Bargeron et al., 2008; Officer et al., 2010; Boone and Mulherin, 2011), the benchmark cumulative abnormal returns (CARs) on stapled deals in the four-month post-announcement event window are about 6% higher compared with a matched sample of deals without stapled financing. And the differences in the benchmark-adjusted buy-and-hold abnormal returns (BHARs) between the two type of deals is even larger. But even when we control for the endogeneity effects, we find that the mean actual CARs (in the four-month post-announcement window) for stapled deals is 3.2% higher compared with the hypothetical average CARs with non-stapled financing, while non-stapled-financed deals would have received on average 3.8% higher CARs if they had received stapled financing. In sum, stapled financing has positive effects on seller shareholder wealth that are statistically and economically significant.

Consistent with signaling framework, the benefits of stapled financing are concentrated on the target segment that is most highly subject to asymmetric information. For example, the improvement in the post-announcement CARs from stapled financing (in our "counterfactual" analysis) is significant only for LBOs for targets with earnings volatility above the sample median — the higher information asymmetry deals — and the magnitude is comparable to that for the overall sample of stapled deals. Similarly, using interaction analysis we find that targets subject to high levels of asymmetric information ceteris paribus have higher post-announcement return performance when they have stapled financing. For example, for a given level of discretionary accruals or intangible assets, stapled finance deals earn about 4.5% higher post announcement returns. Thus, our analysis indicates that the certification role of stapled financing plays a major role in raising seller shareholder wealth.

But if there is significant information production associated with stapled financing, then its effects should be evident in the debt structure and financing costs of the acquisition package even if the buyer does not use the stapled financing contract. Consistent with this argument, we find that buyouts with a stapled financing option have a higher debt-equity ratio and the debt structure involves a lower proportion of senior debt, compared with comparable LBOs without stapled

financing. In spite of the greater buyout leverage, however, buyouts with stapled financing have lower loan costs. For example, stapled financing ceteris paribus reduces the costs of bank loans by 15% (based on the sample mean originating loan spread for such bank loans of 286 bps) and allows longer maturities of term loans compared with the hypothetical situation of no stapled financing**.** Overall, these results are consistent with hypothesis that staple financing acts as a signaling or value certification device and moderates significantly the negative effects of higher levels of asymmetric information on abnormal returns, and allows lower acquisitions financing costs.

In light of the concerns about investment banks manipulating the bidding process for objectives other than price improvement for sellers, we examine whether stapled financing reduces the intensity of bidding competition, in particular the incidence of pricing revisions that favor sellers. We find, however, that stapled financing is significantly and positively related to various proxies for the intensity of bidding competition used in the literature (Officer et al., 2010; Boone and Mulherin, 2011). In addition to these proxies, we develop information on the excess of the final offer price relative to the initial bid price and the number of bid price revisions by potential acquirers, which we argue are particularly relevant to the issue at hand. Other things held fixed, the difference between the final and initial offer prices is about 7% higher for stapled financed deals compared with deals without such financing, and stapled financed deals on average have 3 more bid revisions during the sale process. Indeed, whether a deal involved stapled financing or not has the most sizeable (positive) impact — relative to other target- or deal-related characteristics — on the number of potential bidders in contact with the target or its financial advisor or on the number of bidders that had a confidentiality or standstill agreement with the target. These results are consistent with theoretical models, such as Povel and Singh (2010), who argue that stapled financing can ceteris paribus intensify bidding competition by financially subsidizing weak bidders, which forces the strong bidders to raise their bids.

In sum, we find significant value certification effects of stapled financing that ceteris paribus generate significant price improvements and wealth gains for target shareholders during the acquisition process, lower *ex post* the buyers' costs of debt financing, and allow longer term loans. The credibility of stapled financing as a signal appears based on the expected lending costs from the exercise of the committed financing packages, costs that are borne by the investment banks. However, the provision of the costly signal has to be *incentive compatible* for the banks, i.e., generate expected payoffs that are positive net of the expected lending costs. But what is the payoff to the

offering banks? We find evidence that investment banks offering stapled financing are able to obtain higher percentage of transactions values to be paid as success fees by the seller (the "commission rates"). Ceteris paribus, targets in stapled financed deals paid 1.2% higher commission rates for success fees compared with non-stapled deals. Thus, investment banks offering stapled financing, and thereby incurring expected costs of the financing arrangement, are able to raise their expected advisory fees in two ways. First, by negotiating higher commission rates; and, second, by increasing the expected transaction value of the deal through the signaling or price improvement effects of stapled financing.

Overall, our results are consistent with the predictions of a signaling (or value certification) framework whereby informed intermediaries design financial contracts to credibly signal the unobservable values of targets with relatively superior economic prospects. The analysis is thus consistent with the transactions costs view of contract design and innovation (Coase, 1937; Williamson, 1975). In particular, we highlight issues that arise in contract design when the financial contract — in this case, the stapled financing commitment from the informed investment bank(s) — has a signaling (or value certification) role but also potentially generates lending business for the intermediary. While ex post efficiency would require that the stapled contract be made contingent on the buyer's characteristics, such state-contingent lending terms may dilute the advisor's ex ante commitment that is central to the credibility of the signal and positively related to the expected transaction value, and hence the bank's expected advisory fees. Thus, in designing the stapled financing contract, banks trade off ex post lending efficiency against higher expected advisory fees that arise from signal credibility from ex ante financing commitments.

There is substantial recent interest in the empirical analysis of financial contracting under asymmetric information and agency costs. In particular, this literature has focused on developing the implications of corporate security design — especially debt securities — on firms' investment and financial policy choices (see Roberts and Sufi, 2009). We show the effects of innovations in financial contracting by financial intermediaries have significant economic impact on the market for corporate control.

Our analysis complements other literatures as well. The quality of information production by financial intermediaries has been examined by an extensive literature, but largely in IPO settings and by relating IPO returns to the market shares or wealth of intermediaries (e.g., Beatty and Ritter, 1986; Nanda and Yun, 1997). But in contrast to institutional reputation, which encompasses

the diverse business activity of financial institutions (Tinic, 1988; James, 1992), stapled financing contracts are *deal-specific.* Moreover, a significant portion of LBO deals are done without stapled financing. We, therefore, exploit the opportunity to provide direct evidence on the significance of information production by financial intermediaries on acquisition prices and the returns of target shareholders. Consistent with the predictions of the literature on the economics of information, our analysis suggests that stapled financing can be a substitute for institutional reputation.

Our analysis relates also to the extensive literature on the determinants and performance of LBOs and going private transactions (DeAngelo et al., 1984; Kaplan and Stein, 1993; Guo et al., 2009). More recently, Officer et al. (2010) and Boone and Muelherin (2011) examine the pricing effects of club deal LBOs, where two or more private equity firms jointly conduct an LBO. And as we mentioned above, our study adds to the literature that examines the implications of banks jointly delivering underwriting services and concurrent lending, using the same client-specific information (Puri, 1996; Servaes and Zenner, 1996; Drucker and Puri, 2005; Allen and Peristiani, 2007).

The remainder of the paper is organized as follows. Section 2 presents a stylized siganling model of stapled financing and develops empirical hypotheses. Section 3 describes the data and our sample selection process, while Section 4 specifies the empirical test design. We discuss the results in Sections 5 through 8. Section 9 summarizes the results and concludes.

2 Theoretical Motivation and Hypotheses Development

In stapled financing the seller pre-arranges a financing commitment from its financial advisors, typically the lead investment bank in the asset sale or a syndicate of investment banks, to provide a financing option for potential buyers.[8] . That is, the buyer can, if it chooses to do so, exercise the option of financing the buyout through the seller's investment bank. In sum, stapled financing is a commitment that is provided publicly at the start of the sale process by a financial intermediary that is presumably privately informed of the publicly unknown intrinsic value of the seller's assets. However, the private information of the investment bank *per se* does *not* imply that stapled financing will have a credible value certification role; for this to occur, certain other conditions must be met, as is well known from the Spence-Riley signaling model (Spence, 1973; Riley, 1979).

It is useful to describe the situation in a stylistic fashion and specify conditions that would

[8]For expositional ease, we will refer to the financing provider(s) as 'the investment bank.' We will later examine thye implication of syndication.

result in a separating equilibrium (a là Spence-Riley) where stapled deals receive higher market valuation than they would otherwise have received (without the financing commitment). Then, let $\theta \in \Theta \equiv [\theta_\ell, \theta_h]$ represent the intrinsic value of the seller's assets, which is unknown to the buyers but assumed to be known to the seller and the seller's investment bank. Further, let $F \in \{S, NS\}$ be a binary indicator that represents the decision by the bank to offer stapled financing (S) or not (NS), and let $C(\theta, F) \geq 0$ represent the expected costs to the investment bank from making the stapled offer (or not making the offer).[9] Now, stapled financing commits the bank to the financing. In practice, stapled financing offer is a *contract* that generally specifies the investment bank's commitment to finance the purchase under specified financial or loan conditions.[10] As noted by Povel and Singh (2010), buyers will only exercise the financing option if they cannot find better financing terms elsewhere; hence, the investment bank will make expected losses on the financing.[11] Hence, we expect $C(\cdot, S) > 0$ as long as there is positive probability that the financing option will be exercised; indeed, in our sample (see Section 3), over 40% of stapled offers were exercised. For simplicity, we assume that the investment bank's expected costs from lending without the commitment (i.e., the non-stapled case) are zero.[12]

Finally, let $A \geq 0$ represent the expected advisory fees to the investment bank that result from the sale process. Given the industry practice that ties 'success' fees in an asset sale to the final value of the transaction (see Section 7), the advisory fees will be increasing in the final transaction price P. Moreover, A may be higher, other things held fixed, if the investment bank offers stapled financing; for example, the investment bank may be able to extract a higher fraction of the final sales price (as fees) from the seller because of the potential cost borne by the bank for offering a financing commitment. Finally, since the bank knows the true value of the seller, the negotiated advisory fees may also depend on θ.

[9] Allowing the financing decision to be a real-valued vector with details of the financing commitment (see below) does not qualitatively change the main argument, but complicates notation.

[10] In our sample of stapled deals, statements such as the following are common in the stapled offer: "As of the date of this Agreement, the Commitment Letter is in full force and effect and constitutes a legal, valid and binding obligation of each of Parent and, to the knowledge of Parent, the parties thereto (subject to applicable bankruptcy, insolvency, fraudulent transfer, reorganization, moratorium and other laws affecting creditors' rights generally and general principles of equity)...." In general, we find that the "due diligence" or the typical "market out" provisions, which allow lenders not to fund their commitments under certain conditions in the financial markets, *do not* apply to stapled offers. Typically, the only "out" available to the lenders in the stapled offer appears to be relatively extreme conditions, such as bankruptcy by the seller during the deal process, or very poor credit quality of the buyer.

[11] This argument is supported by the evidence we present in Section 6 below that buyers often use the stapled financing offer to obtain lower cost and/or longer maturity loans from *other* lenders.

[12] It is sufficient to assume that $C(\theta, S) > C(\theta, NS)$, for each $\theta \in \Theta$, which appears a reasonable assumption.

The investment bank's expected utility function may then be written as

$$U(\theta, F, A(P, F)) = A(\theta, P, F) - C(\theta, F) \tag{1}$$

where A is increasing in P and $A(\cdot, \cdot, S) > A(\cdot, \cdot, NS)$. Since the signal in this stylized set-up is binary (rather than continuous), if stapled financing plays a signaling (or certification) role, then the final transaction price function $P^*(F)$ is such that $P^*(S) > P^*(NS)$, other things held fixed. Based on well known arguments from the signaling literature (see Riley, 1979), such an equilibrium may exist if: (1) $U(\theta, F, A)$ is increasing in θ and A, (2) $U(\cdot, S, \cdot) < U(\cdot, NS, \cdot)$ for every (θ, A), i.e., the provision of the financial commitment is costly, and (3) the *net* gains from stapled financing to the investment bank in equilibrium are increasing in seller's value type, i.e., the difference:

$$\Delta(\theta, F) \equiv U(\theta, S, A(P^*(S), S)) - U(\theta, NS, A(P^*(NS), NS)) \tag{2}$$

is increasing in θ. In particular, if $\Delta(\theta_\ell, F) < 0$, then under the conditions stated above there exists some $\theta_\ell < \theta^* \leq \theta_h$, such that the investment bank offers stapled financing only for sellers with value types exceeding θ^*. Hence, the price improvement from the presence of stapled financing is rational given that $\mathbb{E}[\theta \,|\, \theta > \theta^*] > \mathbb{E}[\theta \,|\, \theta \leq \theta^*]$.

Of course, we still have to examine the empirical relevance of the assumptions underlying the signaling through stapled financing, and empirically test for price improvement from stapled financing. We note that the investment bank prefers higher fees, other things held fixed. Furthermore, the investment bank's expected payoffs will be increasing in θ for a variety of reasons: first, the repayment risk from the buyer (if it exercises the financing option) will be decreasing in θ (i.e., higher quality of seller's assets reduce repayment risk); second, since bidders may also receive additional noisy signals on θ, the final bids will generally be increasing with θ; and, third, the advisory fees as a percentage of transaction price may be increasing in θ because higher intrinsic value sellers that may be otherwise undervalued because of information asymmetry may be more willing to offer higher fees in exchange for getting value certification. Hence, condition (1) will generally be satisfied. Next as noted above, condition (2) will also generally be satisfied as long as the staple financing option is exercised with positive probability.[13] Finally, as is typically the case in empir-

[13] Note that, theoretically, only a positive probability of exercising the stapled financing option by the buyer is needed to make the commitment costly (in expected terms) to the offering bank(s).

ical tests of signaling models, we do not have information ex ante to conclude that condition (3) will be satisfied since this depends on the sensitivity of the transaction values and repayment risk to underlying asset quality. However, the empirical content of this condition is the prediction of price improvement from stapled financing; that is, given that conditions (1) and (2) are satisfied, an empirical discovery of significant price improvement from stapled financing is consistent with condition (3) being satisfied.

In sum, the structure of signaling for investment banks through stapled financing a trade-off between the gains from higher advisory fees against costs because of expected losses on loans to buyers (if they exercise the financing option). From an empirical perspective, therefore, the signaling or value certification role of stapled financing suggests the following hypotheses. First, we expect that sellers receiving stapled financing will be characterized with significant information asymmetry, which allows a role for costly signaling. Second, we expect significant price improvement from staple financing. In practice, price improvement occurs through intensification of bidding competition. Hence, the third hypothesis, is that stapled financing is positively associated with the bidding competition. Fourth, we expect that the financing terms of buyers in stapled financing deals to be superior — in terms of interest rates, loan size, and loan maturity — because of the certification role of stapled financing.[14] Finally, we expect advisory fees as a proportion of final sales price to be higher for stapled deals.

We briefly examine the implications of deviations from some of the assumptions above. The impact of the financing commitment should depend not only on whether there is stapled financing, but also on the *terms* of the stapled financing arrangement (such as loan amount, pricing, maturity). In particular, less expensive financing indicates higher asset quality. We will examine the signaling content possibility in our empirical test design below. Moreover, if the stapled financing is syndicated (i.e., provided by a syndicate of banks), then this does not change qualitatively the nature of the predictions given above; the signaling impact will presumably be driven by the most expensive loan available (or the "poorest" signal), which is the approach we will take in our empirical tests below.

We now turn to the empirical analysis. We first describe the data and the sample, followed by

[14]Note that this argument applies irrespective of whether the buyer exercises the financing option or not. Since the investment bank is informed of the seller's asset quality, if stapled financing is offered to better quality firms (as is the case in a signaling equilibrium), then the terms of the financing will also be superior for the stapled financing firms. Meanwhile, even if the buyer does not exercise the financing option, the capital markets (including alternative lenders) will presumably be aware of the information content of the stapled financing signal and offer better terms.

the specification of the empirical test design, and then present the result.

3 Data and Sample Characteristics

3.1 Sample Selection

Figure 1 graphically depicts a typical stapled financing acquisitions deal. In our sample construction, we therefore attempt to capture instances in which prearranged financing terms are included in offering memoranda by sellers seeking bids in auction sales. Most observers agree that the roots of stapled financing can be traced back to the economic recession and financial market disruption that occurred in late 2000, when credit standards tightened considerably and private equity buyers found it difficult to obtain financing for their deals. This view appears confirmed by our sample (see below) that shows the proportion of stapled finance deals was about 10% in 2002. We, therefore, define our sample period as January 1, 2002 through October 16, 2011. Furthermore, we focus on leveraged buy out deals (LBOs) because financing commitments are most relevant to such transactions (especially for private equity investment fund buyers).

We start with *all* closed deals that are labeled "LBO" in the Securities Data Company (SDC) U.S. mergers and acquisitions database (complemented with Standard and Poor's Capital IQ database) for which the target firm was incorporated in the U.S. and deal was closed between 1/1/2002-10/16/2011. This resulted in a sample of 284 deals. We then identified the stapled financed deals by scanning several news sources such as Financial Times, Wall Street Journal, Dealbook.com, Proquest, LexisNexis, Factiva, SEC's Edgar database, and confirmed the presence of stapled finance offers through the DEFM14 and PREM14 proxy filings. Using Capital IQ, which provides links to the company filings so that users can check the original source data, we obtained the names of the targets, advisors, potential bidders, bid and offer prices, transaction size, deal approach, details of staple financing packages offered, status of the deal, announcement and closing dates for all deals. With respect to the actual financing of the transactions, we collected information on debt financing structure and terms from Dealscan, SDC and Capital IQ, as well as manually from proxy filings.

Because stapled financing is especially relevant for relatively large buyouts by private investors, we used the following criteria to construct our sample.[15]

[15] These criteria are also consistent with the recent literature on leveraged buouts or LBOs (Officer et al., 2010; Boone and Muelherin, 2011).

1. The transaction is completed between January 1, 2002 and October 16, 2011 and target must be a publicly traded firm. Our initial sample has 75 stapled and 209 non-staple-financed deals.

2. The acquirer controls less than 50% of the shares of the target at the announcement date and obtains 100% of the target shares. This reduces our sample to 68 stapled and 194 non-staple-financed deals.

3. We further require each target firm to match on the Center for Research in Securities Prices (CRSP) and Compustat databases and to have a share code indicating a public firm (10,11).

These selection criteria result in 54 stapled and 177 non-staple-financed transactions of private acquirers purchasing public targets.[16] After eliminating observations with transaction value less than $50 million (in 2002 dollars), missing transaction values and missing target asset values, we are left with 45 stapled and 141 non-staple-financed deals.[17] In particular, in the stapled deals, 38 are financial (e.g., private equity) buyers while 7 are strategic (or non-financial) buyers; 19 of these buyers exercised the stapled financing option, three of which were strategic buyers.

Figure 2 displays the distribution of stapled and non-stapled deals by year in our sample period. As we noted at the outset, stapled financed deals became increasingly significant during the boom buyout years of 2005-2007, reaching close to 40% of the total sample deals by 2007. But because of the severe financing crunch during the financial crisis, stapled financing grew in importance during 2008-2011.

3.2 Sample Characteristics

Table 1 compares salient target and deal characteristics, as well as a frequency distribution of deals by transaction value, of stapled versus non-stapled deals.

3.2.1 Target Financial and Deal Characteristics

Panel A of Table 1 presents some comparisons of some basic financial characteristics of targets between stapled-financed and non-stapled-financed LBOs in our sample; we also compare our sample

[16] The number of deals in the successive filters is as follows: (1) All M&A announcement took place between 1/1/2002-10/16/2011: 343,370; (2) U.S. incorporated targets: 105,933; (3) LBOs: 10,814; (4) Transaction was closed or succsesful: 9819; and, (5) Target was a public firm: 284.

[17] We note that extending the sample period through the end of 2012 adds only 2 stapled and 6 non-stapled deals (that meet our filters) to our sample. The results are not significantly affected by adding these deals.

LBOs with target firms in public (or non-LBO) deals in our sample period. Following Bargeron et al. (2008), we calculate the market value of target equity 63 trading days prior to the announcement measured in CPI-adjusted 2002 dollars. We define market leverage as total debt, divided by firm value, where firm value is defined as the book value of assets, minus the book value of common equity, plus the market value of equity, plus the book value of deferred taxes. Target profitability is defined as earnings before interest and taxes, divided by the book value of assets.

We find that targets in stapled financing deals are significantly larger, substantially more profitable, and less levered compared with targets acquired in non-stapled deals. In particular, the size differential between the stapled and non-stapled deals is readily apparent in Figure 3. Consistent with this, we see that stapled financing tends to be associated with larger deal values: For instance, over 80% of the stapled financing deals have a deal value greater than $1 billion compared with only 53% of the non-stapled deals. Meanwhile, both stapled- and non-stapled LBO targets are significantly larger, more profitable, and more levered compared with targets in other public deals. The comparison of LBO firms with other public acquisition is consistent with the literature that generally finds LBO firms to be larger, older, more levered, and with lower earnings volatility compared with targets in public acquisitions (e.g., Bargeron et al., 2008).

Since our sample focuses on LBOs, which tend to include larger, older, and relatively low earnings volatility firms (in the overall sample of targets), we need to address whether there is significant heterogeneity within our sample in terms of asymmetric information. As noted in Section 2, the certification or signaling role of stapled financing presumes significant information asymmetry with respect to sellers' valuation types. We notice that there is some evidence in Panel A that is consistent with the hypothesis that stapled-finance firms are more affected by asymmetric information compared with non-stapled targets. The fact that stapled targets are larger and more profitable than non-stapled targets, but yet have lower leverage, which is endogenous, suggests that stapled targets may have relatively low tangible asset intensity and relatively high earnings volatility (e.g., Myers, 1977). That is, the stapled targets may be associated with greater valuation uncertainty compared with non-stapled targets. Somewhat consistent with this, we note that the firm (or enterprise) value multiples (based on revenues or EBITDA) are significantly lower for stapled firms. Finally, the significantly greater number of bidders for stapled deals (compared with both non-stapled LBOs and public acquisitions) despite their lower valuation multiples is suggestive of a positive value certification role of stapled financing.

We will examine the hypotheses of greater information asymmetry of stapled LBOs and the signaling role of stapled financing through a variety of tests below. However, we first analyze our sample for heterogeneity based on information asymmetry measures.

3.2.2 Information Asymmetry Measures

We use measures of information asymmetry that are widely used in the literature. Specifically, we focus on the following characteristics:

Intangibles: Firms with greater equity value in growth options are relatively difficult to value (e.g., Thomas, 2002). Barth et al. (1998) argue that analysts' earnings forecasts require greater effort for firms with greater intangible asset intensity. More generally, greater intangible asset intensity makes firms harder to evaluate and monitor by financial markets. Hence, we use the ratio of intangible-to-total assets (*Intangibles*) as a measure of the extent of asymmetric information and value uncertainty.

Earnings Volatility: Valuation risk will be higher for firms with more volatile earnings history, since this induces greater noise in the inference on the distribution of returns. We use the within-firm standard deviation of earnings (*Volatility*).

Opacity Index: This is a microstructure measure of opacity as described in Bharath et al. (2009) and higher levels for these measures *(Opacity)* imply a higher level of information asymmetry.

Discretionary Accruals: A poor mapping of accruals into cash flows reduces the information content of reported earnings and results in lower quality earnings. If investors differ in their ability to process earnings related information, then poor earnings quality can result in differentially informed investors and thereby exacerbate the information asymmetry in financial markets (Diamond and Verrecchia, 1991; Kim and Verrecchia, 1994). We use discretionary accruals (*Disc. Accruals*) suggested by Dechow and Dichev (2002).

Stock Turnover: The financial market microstructure literature views stock trading volume as negatively related to information asymmetry (Karpoff, 1987; Lo and Wang, 2002). We use the stock trading volume divided by market capitalization (for the target firm) before the announcement of bids (*Stock Turnover*).

The analysis is presented in Panel B of Table 1. Compared to non-stapled-finance targets, stapled-financed targets have significantly higher intangibles-to asset ratios, earning volatility, and opacity, and discretionary accruals. However, stapled financing targets have significantly lower

stock trading volume (as a multiple of market capitalization) compared with targets with no staple-financing. In sum, the sellers receiving stapled finance packages exhibit greater information asymmetry compared with the non-stapled-finance targets, based on all measures of information asymmetry. Thus, even though our sample is composed of LBOs, there is nevertheless substantial sample heterogeneity with respect to measures associated with information asymmetry. This heterogeneity presumably arises because the sample LBOs are drawn from a variety of industries that differ with respect to technological and economic uncertainty and even accounting conventions; the sample LBOs also reflect firm-specific (or idiosyncratic) information histories, based for example on varying managerial approaches to accounting transparency.

The finding that stapled financing targets in our sample score relatively high on information asymmetry measures (compared with non-stapled finance targets) appears consistent with a value certification (or signaling) role for stapled financing. In juxtaposition with another result, namely, that the staple financed targets tend to be larger, more profitable, but less levered than the non-stapled targets, the analysis in Table 1 suggests that the stapled targets have relatively high financing needs, but suffer higher external costs of financing because of agency costs from greater information asymmetry and value uncertainty (Jensen and Mecklin, 1976; Leland and Pyle, 1977), which is consistent with the lower leverage of stapled targets despite being larger and more profitable.[18] Finally, the analysis of panel B suggests that there are two possible types of firm in our non-stapled sample: (1) those that have low information asymmetry or low financing needs and, hence, do not benefit significantly from costly signaling from stapled financing and (2) those that are characterized by higher information asymmetry but have low intrinsic values (i.e., the $\theta \leq \theta^*$ firms in terms of Section 2), or are unwilling to offer higher advisory fees in exchange for the costly financing commitment from the banks (see Section 7).

3.2.3 Investment Bank Activity

Panel C of Table 1 provides information on the most active investment banks involved in both stapled and non-stapled deals in our sample. In terms of most active acquirers by total transaction size, the Goldman Sachs Group (principal investment area) leads the list with $81 billion followed by TPG Capital with $79 billion, and Kohlberg Kravis Roberts & Co (KKR) with $59 billion stapled LBO activity. Moreover, the ranking in non-staple-financed deals roughly mimics the pattern in

[18] Of course, the higher financing needs of stapled targets may also make them attractive to investment banks from the viewpoint of generating debt financing business.

stapled deals. The largest stapled transaction in our sample is the acquisition of TXU Energy in 2007 for almost $36 billion by an investor group led by KKR. Target shareholders received $69.25 in cash for each share of common stock held which represents a 25% premium to the average closing share price over the 20 trading days. The consortium of investment banks providing committed financing to the investor group in support of the transaction included Citigroup, Goldman Sachs, JP Morgan, Lehman Brothers and Morgan Stanley.[19] Finally, Figure 4 shows the distribution of investment banks in our sample based on the number of deals, with Goldman Sachs, Credit Suisse, and Morgan Stanely being most active in this regard.

Overall, the results in Table 1 indicate that the stapled financed targets are larger and more profitable, but appear to exhibit significant information asymmetry that presumably results in relatively valuation ratios (prior to the bidding process). Hence, consistent with the signaling framework, there are potential economic benefits from the value certification or signaling roles of stapled financing. As noted in Section 2, if stapled financing has a significant signaling effect, then this should be reflected in price improvement for sellers' assets, other things held fixed. We now examine this hypothesis using a variety of tests. We also directly study the informational effects of stapled financing. Finally, we analyze the possible effects of investment bankers' conflicts of interest on the bidding process.

4 Price Improvement Effects of Stapled Financing

Expectations of sale price should be incorporated in the announcement effects and the in the evolution of abnormal returns till the point where the outcome of the auction becomes clear. Hence, as a first step towards empirically assessing the effects of stapled financing on the expected sale price, we analyze the announcement effects of merger bids.

4.1 Abnormal Target Shareholder Returns

We compute raw as well as market-adjusted CARs and BHARs over three different event windows around the announcement date of 0: (i) first measure is taken over the announcement day (t=0) to day +126 after the announcement is made (ii) second measure is calculated from day -42 to day

[19] The sponsors pledged to invest $8 billion of equity, $27 billion of new debt and $12 billion of existing debt will be kept in place. The new debt consisted of $20 billion of senior level bank loans, $2 billion of which will not be drawn immediately. There was also be $7 billion of subordinated high-yield bonds.

+126 or the delisting date, whichever occurs first (iii) final measure is the three-day raw (Raw3) or market-adjusted cumulative abnormal return (CAR3-VW and CAR3-EW) constructed around one day before and after the announcement took place. We calculate market-adjusted returns as the sum of daily difference between raw returns and the CRSP value-weighted index (VW) or equally-weighed (EW) index returns over the relevant interval.

4.1.1 Univariate Analysis

In Table 2, we compare the announcement returns of merger bids with and without the stapled financing. In columns 1 and 2, we present the comparison of the mean and median raw, equally-weighted (EW), and value-weighted (VW) CARs and BHARs between stapled financing and non-stapled financing deals for the three windows (specified above). In Columns 4 and 5, we present the corresponding mean and medians when stapled financing targets are matched with a non-stapled target using propensity score matching (see, e.g., Michaely and Roberts, 2011) based on industry and size. The performance of the matching methodology depends on the ability to select control firms that most closely match with stapled-target firms in terms of propensities scores. Figure 5 illustrates the performance of our matching methodology and shows that we have achieved the objective of a close match (in terms of the propensity scores) in our construction of the control groups. Columns 3 and 6 give the differences between the stapled- and non-stapled means and medians and their significance levels.

In both the unmatched and matched comparisons, the mean and median *post*-announcement abnormal returns to target shareholders in stapled financing deals significantly exceed those for the target shareholders of non-stapled deals. Specifically, in the [0, +126] days window, the mean and median equally-weighted CARs for sellers in stapled financing deals were almost *three times* as large as those of matched firms without stapled financing (9% versus 3% in the means and 6.4% versus 2.6% in the medians). The differences are less pronounced in the value-weighted CARs and the BHARs, but are still quite substantial. For example, the median value-weighted CARs for sellers in stapled financing deals is over twice as large as those of matched firms without stapled financing, while the median equally-weighted BHAR in stapled financed deals are 70% higher than matched firms in non-stapled deals. Similarly, we see large and significant differences in the mean and median abnormal returns in the 3-day announcement window of [-1, +1] days, as depicted also

in Figure 6.[20] Not surprisingly, perhaps, the differences are less significant when we take the long window of [-42, +126] days.

The univariate post-announcement abnormal return analysis in Table 2 indicates that shareholders of sellers with stapled financed deals receive significantly greater abnormal returns, in both means and medians, compared with the shareholders of sellers in deals without stapled financing. However, this analysis does not control for the heterogeneity in deals or targets. We, therefore, turn to the multivariate analysis, where we control for salient characteristics of deals, the sellers, and the overall financial markets.

4.1.2 Multivariate Analysis

Of course, the univariate analysis does not control for firm- and deal-specific heterogeneity. We, therefore, check the robustness of the abnormal returns in a "ceteris paribus" context by taking the analysis to the multivariate regression framework. The empirical specification of this multivariate model is:

$$\text{Abnormal return} = \alpha_0 + \alpha_1 Stapled + \mathbf{x}'\beta + u \tag{3}$$

Here, *Stapled* is an indicator variable identifying the presence of stapled financing, $\mathbf{x}$ is the vector of control variables, and u represents the he error terms of the system.

We incorporate several target-specific control factors in $\mathbf{x}$, such as the relative size of the target (to the acquirer) 63 days prior to bid announcement relative, profitability, leverage, firm-risk, past stock return.[21] We also control for offer characteristics such as, the method of deal financing and the identification of hostile tender offers, sponsor clubbing and economy-wide credit market conditions as measured by credit spreads. And we control for anti-takeover provisions adopted by target companies — such as, dual-share class structure, shareholder power, poison pills, and golden parachutes — by using the takeover-defense score provided by Standard and Poor's Capital IQ; this score is determined by assigning points to various types of anti-takeover defense, with a higher score indicating stronger anti-takeover defense mechanisms in place.

[20] We note, for benchmarking purposes, that Andrade, Mitchell, and Stafford (2001) report mean announcement CARs of about 10% for targets in the 1970s, 1980s, and 1990s. For the matched comparisons, we find mean 3-day announcement CARs of about 16% for targets with stapled financing deals and about 7% for target firms in non-stapled deals.

[21] Alternatively, we replaced the target size with the "Relative size" defined as the ratio of target deal value to acquirer market value 5 days prior to bid announcement. Our results are very robust to this alternate definition of target size.

In Table 3, we present the results of multivariate abnormal returns regressions that examine the effects of stapled financing while controlling for various characteristics of the seller, the deal, and the financial markets. We run these regressions for both the post-announcement window ([0, +126] days) and the long window ([-42, +126] days) with the equally-weighted CARs and the BHARs. And we also analyze the three-day CARs around the announcement day. In all cases, we find that the presence of stapled financing has a significantly positive effect on the abnormal returns, controlling for various salient characteristics of the seller, the deal, and the market. For example, in the post-announcement window, the presence of stapled financing ceteris paribus raises the CAR by 5.9%, which is quantitatively similar to the differences we observed in the univariate analysis of Table 2. And, similar to Table 2, the effects of stapled financing on BHARs are somewhat higher compared with CARs, while these effects are also smaller in magnitude for the long event window.

Turning to the effects of firm-specific characteristics, the abnormal returns are ceteris paribus lower for larger, more levered targets that have experienced relatively recent stock returns, presumably because the cost of acquisitions is higher for such sellers, other things held fixed (see, e.g., Officer et al. 2010; Bargeron et al., 2008). However, the effects of size and leverage are relatively weak and do not apply for all abnormal return measures and windows. In terms of deal–specific variables, the significantly positive impact of tender offers, cash acquisitions, and takeover defenses on the event abnormal returns are consistent with related event studies in the literature (Jensen and Ruback, 1983; Asquith and Mullins, 1986). Event abnormal returns are significantly positively related to the number of bidders and tender bids; these results are also consistent with the acquisitions literature (e.g., Servaes, 1991; Officer et al., 2010). We also find that club deals — where a consortium of bidders (typically private equity firms) — are associated with significantly lower abnormal returns, other things held fixed. The negative impact of club deals survives in the long event windows, in contrast to Boone and Mulherin (2011) who find that the negative influence of club deals exists for short announcement windows, but disappears in longer event windows. We note that investment bank reputation has a significantly positive effect on event abnormal returns, other things being fixed, which is consistent with the literature (e.g., Bowers and Miller,1990; Kale et al., 2003). Finally, the abnormal returns are ceteris paribus higher when the successful bidder is a financial buyer. But, as we noted above, this does not mean that the financial buyers always win the bidding contest, since we have 7 successful strategic bidders in our sample.

Taking together, the results of the univariate and multivariate analysis in Tables 2 and 3 indicate

that stapled financing raises the expected sale price and thereby increases the abnormal returns of the target shareholders in the bid process, other things held fixed. In juxtaposition with the finding that stapled financed targets exhibit greater information symmetry (cf. Table 1), these results are consistent with a signaling role for stapled financing regarding sellers' unknown intrinsic valuations (cf. Section 2). We now examine further the incremental effects of stapled financing on targets' that are subject to greater information asymmetry. We do so by introducing interaction effects between stapled financing and information asymmetry measures of Section 3.2.2 in the regression equation (3).

In Table 4 we present the estimates of these interaction effects. We find that for all event windows, stapled financing significantly improves the abnormal returns for firms that suffer from greater information asymmetry in terms of higher earnings volatility, opacity index, intangibles, and discretionary accruals, or lower stock turnover. For example, increasing the targets' intangible-to-total asset ratio by 1% would result in about 4.5% more CAR in the post-announcement window ([0, +126] days) for deals with stapled financing compared with non-stapled financed deals, and the effects of stapled financing on the BHARs and other event windows are of similar magnitude. The effects on other asymmetric information proxies, such as discretionary accruals and earnings volatility are of similar economic magnitude; not surprisingly, these effects are greater for the long event window ([-42, +126] days). Meanwhile, stapled financing also ceteris paribus improves the abnormal returns of lower turnover stocks, which typically have higher expected returns (Gervais et al., 2001). Here, a 1% reduction in the stock turnover of the target yields about 3.5% greater abnormal returns in the post-announcement window ([0, +126] days) for deals with stapled financing compared with non-stapled financed deals. In sum, the analysis of Table 4 reinforces support for the hypothesis of a signaling role for stapled financing for targets that exhibit relatively high information asymmetry.

Finally, as we noted in Section 2, theoretically there should also be a signaling or information effects of the ex ante loan terms in the stapled financing package, conditional on the stapled financing offer. In particular, we expect that targets receiving relatively low debt cost (relatively short maturity loans) will have *higher* (*lower)* event abnormal returns, other things held fixed. To test this hypothesis, we extract the loan terms from the stapled finance offers from the proxy statements.[22] Untabulated results confirm the hypothesis, when we interact the presence of sta-

[22] Out of the 45 stapled deals in our sample, we could find these details in 37 deals. If there are multiple banks

pling with below median loan spreads and loan maturities, However, the statistical and economic significance of the ex ante loan terms are relatively weak compared with the effects from the presence of staple financing. For example, controlling for the presence of a stapled offer, the abnormal returns of targets with below above median debt costs (in the offer) are not significantly different from those of the other targets for the BHAR and value-weighted CAR measures. And for the equally weighted CAR measures, shareholders of targets receiving low debt cost offers obtain 1% additional abnormal returns compared to other targets. In sum, while the financial markets extract information content from both the stapled financing offer and the financing terms in the offer, the economically significant information effects appear to arise from the stapled financing offer, and conditional on the existence of the offer variations in the financing terms appear to have relatively weak effects.[23]

5 Controlling for Endogeneity

In Equation (3), we implicitly assume that *Stapled* dummy is exogenous. However, it is possible that the decision to provide stapled financing depends on an non-modeled or non-observable factor that is also correlated with abnormal returns. In this case, the observed stapled dummy is an endogenous variable in the abnormal return regressions. Because of this omitted variable issue, the estimate of the coefficient on the stapled financing dummy in Equation(3) will be inconsistent.

To correctly estimate the effects of stapled financing, we pose a "what-if" question: Given a stapled financing deal, what would have been the abnormal return without the financing commitment? We answer this question by an endogenous switching regression model (Maddala, 1983). A key advantage of the switching regression framework is that we obtain more useful estimates of (unobserved) counterfactual outcomes. Specifically, the binary decision to offer or not offer stapled financing for deal i,namely, $Stapled_i$ is modeled as the outcome of an unobserved latent variable

providing offers, i.e., syndicated lending, we take a conservative approach with respect to information effects and use the highest debt cost and the lowest loan maturity. However, the relative effects of the stapled offer versus the effects of variations in financing terms do not materially change even if we take the average of the debt costs and maturities.

[23] We note that signaling theory also suggests weaker announcement effects (compared with those seen in Table 2) on sellers that do not receive the stapled offer but whose buyers eventually receive financing from the seller's financial advisors. There is indirect support for this hypothesis because such firms are included in the non-stapled subsample in Table 2. Moreover, there are relatively few such instances in our sample: Only in 8 out of the 141 non-stapled deals did the buyer obtain financing from the seller's advisors.

$Stapled_i^*$ so that:

$$Stapled_i = \begin{cases} 1, & \text{if } Stapled_i^* > 0 \\ 0, & \text{otherwise} \end{cases} \tag{4}$$

The unobserved latent variable is assumed to depend on a vector of variables Z_i that are correlated with the propensity to offer stapled financing — these variables include target-specific characteristics, market conditions.

$$Stapled_i^* = Z_i^{'}\gamma + u_i \tag{5}$$

Here, u_i is an error or residual term with mean zero conditional on the variables in Z_i. Next, let y_{1i} (y_{2i}) be the target's abnormal returns if there is (is not) stapled financing. Of course, we only observe y_{1i} or y_{2i} and never both because $y_i = y_{1i}$ iff $Stapled_i = 1$, and $y_i = y_{2i}$ iff $Stapled_i = 0$. The switching regression framework then models the the abnormal returns with or without stapled financing as two separate linear equations:

$$y_{ji} = x_i^{'}\beta_j + \varepsilon_{ji},\ j = 1, 2 \tag{6}$$

Here, the ε_{ji}, $j = 1, 2$ are also mean zero error terms.

We model the endogeneity between the decision to offer (or not offer) stapled financing and the abnormal returns by allowing the residuals in the abnormal return equations (6) to correlate with the residual in the stapled decision equation (5) so that the unobserved or missing variables — for example, the private information of financial advisors and sellers — in the decision equation also affect the abnormal returns. Specifically, the error terms $(\varepsilon_{1i}, \varepsilon_{2i}, u_i)$ are assumed to be trivariate normal with means $(0, 0, 0)$ and the non-diagonal covariance matrix

$$\Sigma \equiv cov(\varepsilon_{1i}, \varepsilon_{2i}, u_i) = \begin{pmatrix} \sigma_u^2 & \sigma_{u1} & \sigma_{u2} \\ \sigma_{1u} & \sigma_1^2 & \sigma_{12} \\ \sigma_{2u} & \sigma_{21} & \sigma_2^2 \end{pmatrix} \tag{7}$$

This model is a generalization of the classical Heckman (1979) two-stage procedure. Instead of two abnormal return equations for the stapled and non-stapled groups (cf. (6)), under the Heckman model there would be one second-stage equation, which in effect restricts the beta coefficients in

equations (6) to be the same across deal types.[24] In addition, the model with one abnormal return equation would appear to be more suitable for truncated data where the alternative is not observed — such as the effect of labor participation on wage rates, where wages are unobservable for people not in the labor force. However, because observations on abnormal returns are not truncated, but rather relate to different types of LBOs, the two-equation model is more appropriate for our setting.

5.1 Estimation and Inference

Estimation strategies involve sequential estimation procedures or maximum likelihood. The sequential procedure involves first estimating (5) by a probit regression, yielding consistent estimates of γ. With this in hand, then the abnormal return regressions (6) are augmented with inverse Mills ratios (see Greene, 2003) as additional regressors; these terms adjust for the conditional mean of the error terms and allow consistent estimation by OLS. However, it is generally easier (and results in a more efficient estimator) to estimate the model using maximum likelihood. We follow the latter approach.

To infer the net pricing or return improvement from stapled financing, we compute the difference between the actual abnormal return from a stapled deal for target i (i.e., y_{1i}) and the abnormal return *this target* would have obtained if it had received no stapled financing — the "counterfactual." This counterfactual return is easily computed by using $y_{2i} = x_i^{'}\beta_2 + \varepsilon_{2i}$ from (6). The resultant quantity is what we will call the "staple finance price improvement" and is given by:

$$\delta_i = \underbrace{y_{1i}}_{\text{actual}} - \underbrace{E\left[y_{2i} | Stapled_i^* > 0\right]}_{\text{hypothetical}} \tag{8}$$

Econometrically, the hypothetical abnormal return in the second term in (8) is the predicted value from evaluating stapled deal- and firm-specific attributes in the outcome equation for non-stapled LBOs:

$$\begin{aligned} E\left[y_{2i} | Stapled_i^* > 0\right] &= E\left[x_i^{'}\beta_2 + \varepsilon_{2i} \mid Z_i^{'}\gamma + u_i > 0\right] \\ &= x_i^{'}\beta_2 + cov(\varepsilon_{2i}, u_i)\frac{\phi\left(Z_i^{'}\gamma\right)}{\Phi\left(Z_i^{'}\gamma\right)} \end{aligned} \tag{9}$$

[24] This model was first proposed by Roy (1951) to study occupational choices. Lee (1978) applies this model in a study of unionism and wages, while Dunbar (1995) does so in a study on the use of warrants for underwriter compensation.

Here, ϕ and Φ are the density and cumulative distribution functions of the normal distribution, respectively, and $[\phi\left(Z_i'\gamma\right)/\Phi\left(Z_i'\gamma\right)]$ is the inverse Mill's ratio. The model is identified by construction and estimated by maximizing the logarithmic likelihood function:

$$\ln \mathcal{L} = \sum_{i=1} \left\{ Stapled_i * \left[\ln \Phi\left(\eta_{1i}\right) + \ln \phi \left(\frac{\varepsilon_{1i} \diagup \sigma_1}{\sigma_1} \right) \right] + (1 - Stapled_i) * \left[\ln \Phi\left(1 - \eta_{2i}\right) + \ln \phi \left(\frac{\varepsilon_{2i} \diagup \sigma_2}{\sigma_2} \right) \right] \right\}$$

where $\eta_{ji} = \frac{\left(Z_i'\gamma + \rho_j \varepsilon_{ji} \diagup \sigma_j\right)}{\sqrt{1-\rho_j^2}}$ $j = 1, 2$; $\rho_1 = \frac{\sigma_{1u}^2}{\sigma_u \sigma_1}$ is the correlation coefficient between ε_1 and u, and $\rho_2 = \frac{\sigma_{2u}^2}{\sigma_u \sigma_2}$ is the correlation coefficient between ε_2 and u.[25]

5.2 Results

We present the results of the two-stage switching regression tests (described in Section 5) in Table 5. Panel A of this table shows estimation results for the first-stage binary decision to offer (or not offer) stapled financing (see Equation (5)). We model the stapled financing decision based on ex ante firm- and market-related variables that pertain to the financing need — proxied by target size, leverage, and earnings volatility (a proxy for asymmetric information) — and the ease (or difficulty) for buyers of finding financing — indicated by capital availability that we measure by the number of banks giving loans in the target firm's immediate area, the volatility of target's earnings (a proxy for asymmetric information), aggregate stock illiquidity, and the credit spread. Standard economic intuition suggests that the likelihood of stapled financing would be positively related ceteris paribus to the financing need and the difficulty of finding financing. In addition, the decision to offer stapled financing may be influenced by institutional equity owners of the seller and previous advisory relationship between the seller and the financial adviser, which we expect to have a positive effect on stapled financing likelihood. To our knowledge, this is one of the first estimated models of stapled financing choice.

We find that stapled financing is significantly more likely to be offered for larger and more levered targets — that is, where the ex ante expected financing need is greater. Moreover, the likelihood of stapled financing is also significantly higher in tight capital availability conditions — we note that the coefficient for capital availability is highly significant in the predicted direction — and when the equity and debt financing costs are higher, as seen in the significant positive coefficients for stock

[25] To ensure that estimated ρ_1, ρ_2 are bounded between –1 and 1, and the estimated σ_1 and σ_2 are always positive, the maximum likelihood directly estimates $\ln \sigma_1$, $\ln \sigma_2$ and $atanh\ \rho$, where $atanh\ \rho_j = 1/2 \ln\left(\frac{1+\rho_j}{1-\rho_j}\right)$ for $j = 1, 2$.

illiquidity and credit spreads, and the negative effects of recent stock market performance. Thus, and consistent with economic intuition the likelihood of stapled financing increases ceteris paribus when there is a greater threat that financing difficulties will delay (or even derail) the deal.

Stapled financing is also significantly more likely to be offered when there is greater informational asymmetry — measured by more volatile earnings — which is consistent with the inference from the previous analysis. Previous advisory relationship between the seller and the financial advisor make stapled financing more likely, but the presence of institutional equity investors reduces the likelihood of stapled financing deals. We note that institutional ownership is positively related to financial visibility (e.g., Mehran and Peristiani, 2009); hence, buyers of targets with high institutional ownership firms are less likely to face difficulties in attracting financing to complete the deal.

In Panel B of Table 5, we present the estimation results for the second-stage outcome — that is, the abnormal return — equations (see Equation (6)) for the stapled and non-stapled groups. We notice that the sell-side advisory reputation is significantly less important in stapled LBOs — that is, advisor reputation is a less important factor in the generation of abnormal returns for target shareholders in the presence of stapled financing — suggesting that stapled financing serves as a substitute for investment bank reputation, which is consistent with theoretical predictions from the contracting and transactions costs literature. Moreover, we find that the negative effects of higher target leverage are significantly moderated for stapled deals, indicating that the financing commitment of stapled financing has significant content when there is uncertainty regarding the ability of potential buyer to find financing. However, we do not observe significant differences between stapled- and non-stapled deals with respect to the characteristics of the bidding process — such as, the nature of the offer, method of payment etc.

As we noted above, our two-stage switching regression model allows us to answer "what if" type of questions through the estimation of the price improvement measure δ_i (cf. (8)). In other words, we can address the question: For a deal with a stapled offer, what would the alternative abnormal return be had no stapled finance been offered instead? stapled and the "counterfactual" (non-stapled) situations. While most variables have the same sign in both equations, in some cases their effects are notably different in terms of statistical and economic significance across the two deal groups. Table 6 presents the results — actual and hypothetical abnormal returns — from this analysis. We find that on average, for any given stapled deal, a non-stapled deal

would have delivered a significantly lower abnormal returns. For instance, the improvement in CAR from stapled financing (over a non-stapled deal) in the [0, +126] day event window is 2.7%. Specifically, the mean actual abnormal return (CAR) obtained over the four month window after the deal announcement by stapled deals is 2.7% higher compared with the hypothetical average CAR within the same event window with non-stapled financing. Conversely, non-stapled deals would have been better off in terms of abnormal returns (during the four-month window after announcement) by 3.8%, on average, if stapled financing had been employed. Both differences are highly significant. We observe similar patterns within the [-42, +126] and [-1, +1] event windows.

Next, Table 7 shows the pricing improvement from stapled financing based on the extent of information asymmetry (IA). As in Table 6, we show the actual mean CARs and hypothetical mean CARs for stapled and non-stapled LBOs. However, we now further segment targets in terms of "High" and "Low" information asymmetry (IA), using the volatility of earnings as the asymmetric information proxy. We rank target firms based on their volatility measures a quarter before the announcement date and label target firm as "High" ("Low") if the their volatility measure is above (below) the sample median. Panel A shows that the price improvement from stapled financing for deals that are observed to obtain such financing (cf. Table 5) is significant *only* for the high IA firms, i.e., for low IA firms the difference between the observed event window abnormal returns and the corresponding estimated returns from the hypothetical of not obtaining stapled financing is not statistically significant. On the other hand, for high IA firms this difference is significant and 3.1% for the post-announcement window ([0, +126] days), similar to that seen in Table 5 (for the same window) for the total sample of stapled finance LBOs. Meanwhile, for the *non-stapled* LBOs in the sample, the hypothetical price improvement in the post-announcement window from stapled financing is significant — and roughly of the same magnitude — for both high IA and low IA firms. However, for the long event window ([-42, +126] days), the hypothetical price improvement occurs only for high IA deals — that is, only high IA non-stapled targets would have significantly improved their performance under the hypothetical of getting stapled financing.

The empirical results are above are consistent with hypothesis that staple financing acts as a signaling or certification device and moderates the negative effects of higher levels of asymmetric information on abnormal returns. But if there is significant information production associated with stapled financing, then its effects should be evident in the debt structure and financing costs of the acquisition package *even if* the buyer does not use the stapled financing contract.

6 Effects of Signaling on Debt Structure and Financing

In this section, we examine the effects of stapled financing on the financial structure and financing costs of the acquisition independent of whether the staple finance option is exercised or not.

6.1 Buyout Debt Structure and Financing Terms

In an LBO, the target company's existing debt is usually refinanced (although it can be rolled over) and replaced with new debt to finance the transaction. Multiple tranches of debt — such as revolvers, term loans, subordinated notes, junk bonds, mezzanine debt — are commonly used to finance LBOs. A typical leveraged loan includes a revolving credit line and several term-loan facilities. Under the term-loan tranches, the borrower draws the full amount committed and the loan is canceled once it is repaid. By contrast, a revolving line, designed to optimize the availability of working capital allows the borrower to draw and repay committed funds at its own discretion. If the loan remains undrawn, the borrower only pays a commitment fee. Institutional money backs term loan B, with term loan A typically held by banks.

In stapled deals prospective buyers are not required to use the staple, instead they usually seek their own financing sources to match or "beat" the staple. They can go to their preferred providers to get leverage but this time with a greater bargaining power and with better negotiating leverage.[26] Thus, we expect that the stapled financing buyouts should lower loan spreads, other things held fixed, and also be associated with larger revolvers and greater proportion of longer-term financing.

As we noted above, the signaling or value certification effects of stapled financing should, therefore, impact not only the bidding or sale process, but also the financing of the acquisition following a successful conclusion of this process. Screening and monitoring of borrowers is a major preoccupation of lenders because of adverse selection and moral hazard (Diamond, 1984; Rajan, 1992). Consequently, observable borrower attributes that signal financial strength result ceteris paribus in lower loan prices (offering spreads) and also allow borrowers to obtain larger revolvers and longer-

[26] This aspect of stapled financing appears to be well recognized in the industry. For example, the *Financial Times* (May 21, 2010) reported that: "The $3.4bn acquisition of Interactive Data Corp (NYSE: IDC) is backed by a $1.3bn term loan, set to price as early as this week, after being delayed due to broader market pressures stemming from the European bailout, sources close to the deal said. Though pricing remains specific to the credit at hand, loans like those of IDC could see pricing that was Libor+ 350bps two weeks ago reach +400bps with an original issue discount of 98.5 and a Libor floor between 125bps to 200bps, according to the financing source. Even so, banks lending to IDC were said to be suggesting better terms to a preliminary staple financing package offered by sell-side adviser Goldman Sachs. Each bidder in the auction solicited at least three banks to fully fund its offer without the staple, yet another sign that bank willingness remains steadfast."

term financing. Thus, the presence of stapled financing should influence both the buyout debt structure — the composition of debt — and the financing costs compared with successful deals that did not have the stapled financing option; specifically, we expect stapled finance deals to have more aggressive debt structure and lower debt costs, other things held fixed.

To study the effects of stapled financing on the debt financing structure and financing terms of the buyouts, we use LPC Dealscan, Capital IQ and SDC collectively to reconstruct all individual tranches of each deal.[27] We also manually check proxy filings, including schedule 14A, TO-T, S-4 and 13E3, for information on deal financing for all sample deals when these filings are available in Edgar.[28] For each loan tranche, we retrieve information on its type, currency, base rate, pricing, maturity, seniority, and collateral.[29] In particular, we measure loan prices as the "drawn all-in-spread" above the benchmark (*AISD*) at the time of loan origination, which is the standard loan pricing variable used in the bank financing literature (see Guner, 2006).

In Table 8, we present a univariate analysis of the effects of stapled financing on the capital structure of successful deals and their loan terms through a comparison of the means of salient characteristics of stapled versus non-stapled (successful) deals. We reiterate that stapled financing is an option, which sometimes may not be exercised by the winning bidder (or buyer). Therefore, the results reported in Table 8 (and in the multivariate analysis of Table 9 below) reflect the signaling or certification effects of the *presence* of stapled financing because they apply even if the buyer does not exercise the stapled financing option and negotiates a new financing arrangement.

We find in Table 8 that stapled deals have a significantly lower equity to capital ratios and senior secured debt, but have greater access to revolver loans and employ more junior debt compared with non-staple-financed deals. Thus, stapled financing appears to allow successful bidders to use more aggressive debt structures, with greater use of debt — including higher default risk debt.

[27] Dealscan is mostly used to obtain information about loans, while Capital IQ and SDC are mostly used to obtain information about bonds.

[28] For deals already in DealScan, we check with information in proxy filings and when DealScan and proxy filings give different information, we stick with that in DealScan, as terms specified in proxy filings can be adjusted after the filing and hence may not be final.

[29] For example, Hellman & Friedman, LLC signed an agreement to acquire Catalina Marketing Corp. for $1.58 billion on April 17, 2007, and the aggregate amount of financing necessary to complete the merger was approximately $1.7 billion. Goldman Sachs was the stapled financing provider. The company received an equity commitment letter from the Hellman & Friedman (H&F) Investors committing to purchase up to $585 million of the equity in the merger. The company also received a $760 million senior secured credit facility, consisting of a $660 million senior secured term loan facility and a $100 million senior secured revolving credit facility; a $330 million senior unsecured bridge facility; a $160 million senior subordinated bridge facility. The loans under the senior secured facilities carried interest at a rate equal to LIBOR plus an applicable margin varying between 3.75% and 5% and maturity between 72 to 84 months. (Debt financing providers were Goldman Sachs, Bank of New York, UBS Securities, Bear Stearns, Wells Fargo, Morgan Stanley).

Furthermore, Table 8 also reveals significantly lower loan costs — the originating loan spreads — for stapled financed deals. In particular, the loan spreads for the revolvers in stapled financed deals are over 18% lower compared with deals without such financing arrangements, while the corresponding loan cost differential for longer term loans (the term B loans) is also of comparable magnitude. Moreover, the loans in the stapled financed deals also have significantly longer maturity; for example, term B loans in stapled deals have on average 10 month longer maturities compared with similar loans in non-stapled deals. In sum, the univariate analysis indicates that stapled financing is associated with significantly lower mean loan costs and significantly higher maturity for longer term loans.

Of course, the univariate comparisons in Table 8 do not control for the various determinants of loan cost — that are related to specific characteristics of the loan deal, the borrower, and the market. We, therefore, present the results of a multivariate analysis of the effects of stapled financing on loan prices and maturities in Table 9. There is a substantial literature that examines the determinants of loan costs and maturities (Angbazo et al. 1998; Campbell and Taksler, 2003; Bharath et al., 2011), and we use the significant factors for loan pricing identified in this literature as controls. In particular, we control for the default risk of the successful bidders by using the standard determinants, such as leverage, credit ratings, profitability, volatility of earnings, capital expenditures, and firm size; we also control for deal-specific indicators of default risk, such as whether the loan is secured; and we use the macroeconomic factors that are known to impact corporate loan costs, such as credit spreads (i.e., the difference between the monthly yields of AAA and BB- rated bonds) and the recent stock market index.

The analysis in Table 9 relating to the effects of the control variables is consistent with the theoretical and empirical literatures on financial contracting (see, e.g., Roberts and Sufi, 2009). Other things held fixed, loan costs (maturities) are significantly and positively (negatively) related to leverage, earnings volatility, capital investment, and credit ; but negatively (positively) related to firm size, profitability, and recent stock returns. Furthermore, the results in Table 9 continue to indicate that stapled financing has a significantly negative effect on loan costs of the successful bidders, other things held fixed. The presence of stapled financing ceteris paribus reduces originating loan spreads for traditional bank loans (which include revolving lines of credit and Term A loans that are typically kept on the books of issuing banks) by over 42 basis points (bps); the corresponding effects on the costs of term B loans is 33 bps, while for the senior loans it is over 18 bps.

These effects are economically significant. For example, stapled financing ceteris paribus reduces the costs of revolvers and term A loans by about 15% based on the sample mean originating loan spread for such bank loans of 286 bps. Stapled financing allows successful bidders to arrange loan facilities of longer maturities, with an average difference of over 6 months. Interestingly, we find that financial buyers on average pay higher debt costs and have shorter loans relative to strategic buyers, so they do not appear to have a financing advantage over strategic buyers.[30]

In Table 10, we pose the "counterfactual" question: What would be the estimated loan spreads (for different types of loans) for LBOs with stapled financing if they did not have such financing and, conversely, what would be the borrowing costs in non-stapled deals if they did have stapled financing? We use the methodology described above; in particular, we use maximum likelihood methodology to estimate Equations (5)-(6). We find that the loan costs for staple deals would have been significantly higher — both in statistical and economic terms — for the major loan types. For example, for revolver and Type A loans (i.e., bank loans), the initiating spreads would be about 44 bps higher (over 15% of the sample mean), while for the longer term loans, the spreads would be higher by about 26 bps on average. Moreover, the term B loans would also have longer maturities of about 8 months on average, and the difference in loan maturities is also highly significant. On the other hand, if the non-stapled LBOs had acquired stapled financing, then they could have *reduced* their bank loan spreads by 36 bps and their long term loan spreads by over 43 bps, while increasing the average maturity of these loans by about 8 months.

We conclude from this analysis (cf. Tables 8-10) that the signaling or value certification effects of stapled financing are significant enough to ceteris paribus lower *ex post* the buyers' costs of financing the buyout, allow longer term loans, and a more aggressive debt structure. Thus, the results in this section reinforce the findings of the previous section regarding the significant price improvement effects of stapled financing. However, as we noted in Section 2, the credibility of the signaling content of stapled financing is based on the expected lending costs from the committed financing packages for buyers, and these costs are borne by the investment banks. We now examine the relation of stapled financing to the payoffs that accrue to investment banks from the deal process.

[30] We implicitly control for loan size through the size of the target. However, the higher loan spreads and shorter maturities for financial buyers could reflect target risk not captured by the standard measures we use. We note that the loan terms for financial buyers here include stapled packages that were exercised, stapled deals where the commitment was not exercised, and the non-stapled deals.

7 Stapled Financing and Advisory Fees

Investment banks' fees in the acquisitions (sale) process typically includes retainer fees, which are "upfront" fees paid to indicate the seller's seriousness of intent; "success" (or "transaction") fees that are that are generated in the event of the successful closure of the deal and typically based on a percentage of the final transaction price; "breakup" fees in case the seller and the advisor terminate their commercial relationship during the sale process; and, reimbursement of expenses. The success fee is typically the largest payoff for the investment banks. As noted, this fee is usually based on the final price of the transaction, subject to certain terms and modifications, and generally negotiated by the seller and the advisor prior to launching the sale process. The success fee is typically computed based on a percentage of the final transaction price (in the event of a successful closure of the deal), although the commission structure can be complex.[31]

If the advisory fees are based on a percentage of the final transactions price, then investment banks' expected payoffs will increase if they offer stapled financing and it results in rasing the final transactions price of the seller's assets, other things held fixed. Thus, the offer of costly stapled financing is, at least theoretically, optimal for investment bankers if the there is expect net improvement in payoffs due to a significant signaling or value certification role of stapled financing, which appears to be consistent with our analysis above. Furthermore, in practice the success fee commission rates or percentages are not based on formulas but customized and subject to negotiation.[32] Hence, the signaling framework suggests that investment banks may negotiate for higher commission rates (in success fees) in exchange for undertaking costly stapled financing.

In Table 11, we examine the relation of investment banks' success fees to stapled financing. We obtain the details regarding these fees from the proxy statements filed with the stapled financing documents and SDC. We use as dependent variables both the commission rates, i.e., percent of transaction value to be paid as success fees, and the logarithm of the actual fees paid. Our controls include the target's size (market cap 63 days before the bid announcement); the advisor's reputation

[31] A widely used method for determining the success fees is that devised by Lehman Brothers in the 1970s. This procedure used a 5% commission for the first million dollars of a transaction, 4% for the second million, and son, with a 1% commission for everything above $4 million. But because of inflation, which reduced the real value of the fees, in the 1980s and 1990s, the "double" Lehman rule was sometimes utilized, which doubled the commission percentages of the original formula. However, in practice, such formulas are rarely applied strictly because the fee is highly customized.

[32] These features of success fees are well known in the industry and descriptions may be be found on many online resources, such as http://www.crossbordermanagement.com/en/guides/mergers-a-acquisitions-in-the-us/investment-bankers/investment-bankers-fees.

and previous business relationships with the target; the number of advisors; the recent stock market performance; dummy if both the target and the acquiring firms are in the same business line (same SIC codes); dummy if at least one of the advisors was advising both the target and the acquiring firms for the deal. We note that while we use both commission rates and fee amount paid as dependent variables, theoretically, we are interested in the relation of the commission rates to stapled financing. This is because, as noted above, the commission rates are negotiated ex ante, presumably jointly with the stapled financing decision. Moreover, the absolute fee amount is based on the final transaction value that already includes the price improvement effects of stapled financing.

We find that the commission rates of the success fees are significantly higher for stapled financed deals, other things held fixed. Ceteris paribus, targets in stapled financed deals paid 1.2% higher commission rates for success fees compared with non-stapled deals. We also find that larger targets paid higher commission rates, and that investment bank reputation is positively related to commission rates. On the other hand, commission rates are lower when there are more financial advisors and if there is a previous business relationship with the advisor(s). Finally, commission rates are cetris paribus higher in stock market booms.

In sum, we find evidence confirming that investment banks offering stapled financing, and thereby incurring expected costs of the financing arrangement, are able to raise their expected advisory fees in two ways. First, by negotiating higher percentage of transactions values to be paid as success fees by the seller; and, second, by increasing the expected transaction value of the deal through the signaling or price improvement effects of stapled financing. These results are consistent with the requirement of the information equilibrium (cf. Section 2) that investment banks have incentives to provide a costly signal, namely, stapled financing — in this case through higher expected advisory fees.

8 Stapled Financing and Bidding Competition

In this Section, we examine whether stapled financing negatively impacts bidding competition and price improvement in the acquisition process, in light of the concern that banks who offer stapled financing may have a conflict of interest in manipulating the bidding process towards their lending business at the expense of the seller. Bidding in the takeover market is often anonymous because both the seller and its investment bank(s) are bound by confidentiality contracts not to reveal the

identities of the competing bidders. Moreover, both the theory and evidence in auction design suggests that the anonymous, confidential nature of the bidding in the pre-public takeover market has pro-competitive features (Marshall and Marx, 2009). Indeed, Boone and Mulherin (2011) find that much of the competition in corporate takeovers takes place before the public revelation of a bid. Under such conditions sellers' investment banks may have the incentives to manipulate the winning bids towards buyers who will accept the bank's financing offer — and thereby provide the bank with substantial financing fees — but who may not be the highest bidders; these concerns underlie the legal actions such as those against Del Monte Food Company and its financial advisor Barclays Capital by the company's public shareholders (as described in the Introduction).

But if the investment banks providing stapled financing have such conflicted interests, then we expect that bidding competition will be compromised; in particular, and other things held fixed, the price improvement (relative to the initial bids) will be lower in stapled financing deals compared with (similar) deals without stapled financing. We, therefore, test this implication by comparing the intensity of bidding competition and the price improvement in the bidding prices between stapled and non-stapled finance deals.

We use four measures of competition at various stages of the bidding process that is used recently in the literature (Officer et al., 2010; Boone and Mulherin, 2011). *Contact* is the number of potential bidders with which the target and its investment bank were in contact. *Confidential* is the number of potential bidders that engaged in a confidentiality or standstill agreement with the target. *Offer* is the number of potential bidders submitted a formal binding offer and *PostDummy* is an indicator variable which equals one when another potential acquirer bids for the target six months after the deal announcement is made. However, to test directly the possibility of reduced price improvements due to investment banks' conflicts of interest, we measure the excess of the final offer price relative to the initial bid price ($\Delta BidPrice$) and the number of times the bid price is revised by potential acquirers *(Revision)*. We use DEFM14A and PREM14A proxy filings and news sources — LexisNexis, Factiva and Capital IQ — to compute our measures of bidding competition.[33]

[33]For example, according to the SEC's DEFM14A filing by Bisys Group, Inc., beginning in August 2006, Bear Stearns — which also prepared the stapled financing package — contacted 142 potential bidders, including 67 potential strategic bidders and 75 potential financial bidders. 119 potential acquirers expressed interest in a transaction with the Company (including 47 potential strategic buyers and 72 potential financial sponsors). A total of 77 parties entered into confidentiality agreements and received a confidential information memorandum with respect to the Company. Around the second week in November, the Company received a total of 26 preliminary indications of interest. Three of the 13 indications of interest were received from strategic bidders while 9 of the 13 indications of

8.1 Results

We present the effects of stapled financing on the intensity of bidding competition in Table 12. The coefficient estimates in there indicate that stapled financing is significantly and positively related to the intensity of the bidding competition. We find that stapled financing is has a significantly positive relation to all measures of bidding competition intensity specified above (except for the presence of a bidder six months after the deal announcement). Specifically, stapled financing is significantly and positively associated with the number of potential bidders contacted; with the number of potential bidders that engaged in a confidentiality or standstill agreement with the target; with the number of potential bidders that submitted a formal binding offer; with the excess of the final offer price relative to the initial bid price; and the number of times the bid price is revised by potential acquirers. In particular, holding constant some salient characteristics of the deal, the seller, and the financial markets, the excess of the final offer price relative to the initial bid price in stapled financing deals was 6.6% higher compared with non-stapled financing deals.

We note that there is a potential endogeneity issue in deducing the causal effects of stapled financing on the intensity of bidding competition. This is because attractive deals ceteris paribus will tend to invite greater interest from bidders and, as we have seen in Table 2, stapled financing tends to be offered for sellers with good economic fundamentals and relatively low credit risk. Hence, there may be common factors — some of which may be latent — that generate the positive association between stapled financing and bidding intensity observed in Table 12. To address this concern, we re-estimated the effects of stapled financing on the bidding intensity proxies using a model with latent common factors estimated by the generalized method of moments (GMM). Our basic empirical specification for the joint determination of the use of staple financing and the bidding intensity is:

$$\gamma_i = \kappa_i A + z_i^{\gamma} B + \Gamma_i + \varepsilon_i \tag{10}$$

$$\kappa_i = z_i^{\kappa} C + \Gamma_i + \nu_i \tag{11}$$

interest were from financial bidders. Company received of preliminary indications of interest from 26 of those parties, including 13 for the whole company, and invited 9 potential acquirers to provide definitive proposals of the terms under which they would be prepared to acquire the whole company. After negotiations, the Company was acquired by Citi Group, Inc at an offer price of $12 per share in cash, of which $11.85 would be paid in cash by Citi as merger consideration and $0.15 would be paid as a special dividend of the Company to stockholders upon consummation of the merger. This price represented an increase of approximately 9% from the initial bid price of $11.00 per share placed by another potential financial acquirer who indicated that it was relying on Bear Stearns' stapled financing package, and had also engaged three other banking firms to provide alternative financing proposals.

Here, γ_i is the use of stapled financing and κ_i is the bidding intensity; z_i^γ and z_i^κ are the vectors of observable exogenous variables (with the first entry of 1) that are the covariates in the regression equations for γ_i and κ_i, respectively; Γ_i is the vector of unobservable common factors that influences both γ_i and κ_i; A, B, and C are vector of unknown parameters; and, (ε_i, ν_i) are unobservable firm-specific error terms. Following Lewbel (1997), Dagenais and Dagenais (1997), and Erickson and Whited (2000, 2002), we use the information contained in the third—and higher-order moments of the joint distribution of the observed regression variables. This approach controls for the presence of common latent determinants of the bidding intensity and the stapled financing, and it is robust to nonsymmetric distributions. We summarize the approach here but provide details in an Appendix.

Returning to (10)–(11), we let $z_i = (z_i^\gamma, z_i^\kappa)$. Then, under the assumptions that (i) the random errors ε_i and ν_i have mean zero and variances σ_ε^2 and σ_ν^2, respectively, (ii) ε_i and the elements of z_i, Γ_i, ν_i have finite moments of every order, (iii) $(z_i, \Gamma_i, \varepsilon_i, \nu_i)$ are i.i.d. for every i, and (iv) $\mathbb{E}\left[(z_i, \Gamma_i)' (z_i, \Gamma_i)\right]$ is positive definite, we obtain GMM estimates for each year and combine them using the MDE (minimum distance error) method (cf. Erickson and Whited, 2000, 2012). Following usual practice, we perform inference by calculating standard errors based on Hansen (1982) and through the GMM J-test of overidentifying restrictions.

The results, which are untabulated, reinforce those given in Table12: Stapled financing has a significantly positive effect on the intensity of bidding competition, other things held fixed, even after controlling for latent or unobserved common factors in the availability of stapled financing and the intensity of bidding competition. Thus, the analysis in this section does not support the hypothesis that investment banks' conflicts of interest for accessing financing fees would hurt sellers by lowering the intensity of bidding competition and the price improvement during the bidding process. This result complements the analysis from the previous section that investment banks earn higher commission rates from stapled financing targets. As pointed out be Mehran and Stulz (2007), market participants appear to consider financial intermediaries' conflicts of interest when making their decisions. In the context at hand, sellers would presumably be unlikely to pay higher commission rates for advisory fees in stapled deals, if they expected the stapled offer to adversely affect the expected sale price.[34]

[34] Of course, these findings do not *prove* that generating lending business is not a motivation for investment banks in offering stapled financing. Our analysis shows, however, that sellers receiving stapled financing do not appear to be adversely affected in terms of bidding competition and price improvement in the acquisition process.

8.2 Discussion of Results and Relation to Literature

Overall, our analysis above is consistent with the hypothesis that stapled financing plays a certification role in an informational equilibrium, as described in Section 2. Stapled financing is provided to sellers that exhibit greater information asymmetry and have larger financing needs. That is, targets that receive stapled financing appear to have higher benefits ex ante from value certification or signaling. Furthermore, stapled financing significantly increases target shareholder wealth in the acquisitions process, allows the buyers to obtain significantly less expensive and longer maturity debt financing, and significantly raises the final bid price over the initial bid. Thus, stapled financing appears to be a credible signal on the intrinsic value of targets that suffer higher agency costs or adverse selection discounts due to information asymmetry. However, in an information equilibrium, stapled financing can be a credible signal only if it is costly for investment banks. Hence, the argument that lenders likely suffer net expected losses when the financing option is exercised and the evidence that stapled financing is a contractual commitment that does not offer the typical "escape" clauses for lenders are consistent with the costly signaling requirement.

Of course, investment banks have to be compensated for this cost and our analysis indicates that this compensation occurs through higher expected advisory fees. We note that stapled financing can be associated with both higher abnormal returns and higher advisory fees (even when the seller agrees to pay higher commission rates on success fees for the investment bank) as long as the sale price improvement from certification *net of advisory fees* is positive.[35] Moreover, our results are consistent with the stapled targets paying quasi-rents to the informed investment banks in the form of higher advisory fees — even holding fixed the transaction values (by agreeing to pay higher commission rates). However, this is because of the informational asymmetry friction that can not be costlessly removed: in equilibrium, for stapled targets, providing rents to investment banks in the form of higher advisory fees for the value certification from stapled financing is still preferable to the alternative of being undervalued because of significant information asymmetry; this is similar to informational asymmetry explanations for IPO underpricing (e.g., Rock, 1986).

The results also suggest an interesting trade off for investment banks regarding the design of the stapled financing contract. Ex post efficiency (Holmstrom and Myerson, 1983) would require that

[35] More formally, let $\bar{P}(F)$ represent the tarnsaction value (or sale price) gross of advisory fees for $F \in \{S, NS\}$. Then, the equilibrium sale price with stapled financing satisfies the relation $P^*(S) = \bar{P}(S) - \mathbb{E}[A(\theta, P^*(S), S) \,\big|\, \theta > \theta^*]$, and similalrly for $P^*(NS)$. Hence, it is possible that $P^*(S) > P^*(NS)$ and that the expected advisory fees for stapled firms exceed thos of non-stapled firms, as long as $\bar{P}(S) - \bar{P}(NS)$ is sufficiently high.

the stapled offer be made contingent on the buyer's characteristics. However, such state-contingent lending terms may dilute the advisor's commitment or certification of seller's value, which may reduce the signaling impact on price and lower expected advisory fees. Thus, the stapled contract design provides an example of trading off reducing the ex post lending costs (if the offer is exercised) against getting lower expected advisory fees ex ante. Finally, viewing the acquisition process as an auction, our results suggest that third-party value certification can have significant effects on bidding intensity and the final transaction price.

9 Summary and Conclusions

Financial intermediaries play an important information production role in the acquisitions process by lowering transactions costs arising from value uncertainty and asymmetric information. Stapled financing is an important recent innovation in M&A where the seller pre-arranges a financing commitment from its financial advisors as an option for potential buyers, can provide a credible signal of the seller's unknown value because the commitment is costly for the offering investment banks(s). However, stapled financing also raises concerns of conflicts of interest because investment banks may be motivated by potential gains from providing debt financing to the buyers of stapled targets, rather than finding the highest possible price for the seller. These conflicting effects of stapled financing exemplify the tension that arises when financial intermediaries perform both an information production and a financing function. An empirical analysis of the certification effects of stapled financing is therefore of substantial interest.

Using a unique data set, we find that targets that receive stapled financing exhibit greater information asymmetry and have larger financing needs compared with the non-stapled-finance targets, which is consistent with the view that stapled financing is offered when there are higher benefits ex ante from value certification. However, the identification of the price improvement effects of stapled financing on the seller (or target) shareholder wealth during the acquisitions process is challenging because of endogeneity issues: the decision to provide stapled financing is endogenous and may depend on non-observable factors that are also correlated with the abnormal returns. Using a two stage switching regressions model that generalizes the classical Heckman (1979) two-stage procedure to control for self-selection bias, we find that stapled financing has statistically and economically significant positive effects on seller shareholder wealth and especially improves the wealth of sellers with assets that are subject to greater asymmetric information — that is, suffer

from higher agency costs or adverse selection discount. Complementing this evidence, we find that stapled financing has significant positive certification effects for the debt structure and loan costs of takeover financing, and on the price improvement and competition intensity in the bidding process.

The credibility of the value certification appears to be generated by the contractual commitment of stapled financing, which generally eliminates contingencies that typically allow to allow lenders to withdraw from their lending commitments. However, our analysis indicates that banks offering stapled financing are on average able to negotiate higher success fee rates, i.e., the percentage of transaction value paid as fees in the event of a successful transaction. Thus, consistent with the Spence-Riley informational equilibrium framework, costly signaling through stapled financing appears incentive compatible for the investment banks and the sellers.

Our analysis highlights the role of financial contracting in resolving value uncertainty in the M&A process. In particular, in designing the stapled finance contract, financial intermediaries appear to trade off ex post lending efficiency against increases in advisory fees ex ante. Finally, the two stage switching regression methodology used in this study should prove more generally useful in examining the effects of financial contracts on market returns, because such situations are fraught with endogeneity issues.

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Appendix: Estimation Details of GMM

For notational ease, we rewrite the system (10)–(11) as:

$$\gamma_i = \kappa_i A + z_i B^{\dagger} + \Gamma_i + \varepsilon_i \tag{12}$$

$$\kappa_i = z_i C^{\dagger} + \Gamma_i + \nu_i \tag{13}$$

where $B^{\dagger} \equiv (B, 0)'$ and $C^{\dagger} \equiv (C, \mathbf{0})'$ (where 0 is a vector of zeros of appropriate dimension). The reduced form of (12) is given by:

$$\gamma_i = \Gamma_i A^* + z_i B^* + \varepsilon_i^* \tag{14}$$

where $B^* = B^{\dagger} + AC^{\dagger}$ and $A^* = (1 + A)$, $\varepsilon_i^* = (A\nu_i + \varepsilon_i)$. The population regression of κ_i on z_i is $\mu_\kappa = E\left(z_i' z_i\right)^{-1} E\left(z_i' \kappa_i\right)$. Using Equation (13), denote the regression of Γ_i on z_i by $\mu_\Gamma = E\left(z_i' z_i\right)^{-1} E\left(z_i' \Gamma_i\right) = \mu_\kappa - C^{\dagger}$. It is assumed that z_i is exogenous and observable by the econometrician. Subtracting $z_i \mu_\kappa$ from both sides of (13) gives:

$$\kappa_i - z_i \mu_\kappa = \Gamma_i + z_i \left(C^{\dagger} - \mu_\kappa\right) + \nu_i = \Gamma_i^* + \nu_i \tag{15}$$

where $\Gamma_i^* = \Gamma_i - z_i \mu_\theta$. By construction, the residuals Γ_i^* from the regression Γ_i on z_i have an expectation of zero. Similarly, using Equation (14) $\mu_\gamma = E\left(z_i' z_i\right)^{-1} E\left(z_i' \gamma_i\right) = A^* \mu_\Gamma + B^*$. Subtracting $z_i \mu_\gamma$ from both sides of (14) yields:

$$\gamma_i - z_i \mu_\gamma = A^* \Gamma_i + z_i \left(B^* - \mu_\gamma\right) + \varepsilon_i^* = A^* \Gamma_i^* + \varepsilon_i^* \tag{16}$$

Note that for the reduced-form model in (15) and (16) it holds that $E\left(\Gamma_i^*\right) = E\left(\varepsilon_i^*\right) = E\left(\nu_i\right) = 0$, $E\left(\varepsilon_i^* \nu_i\right) = \sigma_{\varepsilon\nu}$, and Γ_i^* is independent of ε_i^* and ν_i.

The estimation of A can be obtained in two steps (e.g., Erickson and Whited, 2002). First, an estimate for the population means μ_γ and μ_κ can be obtained from the least square estimates $\hat{\mu}_\gamma = \left[\sum_i z_i' z_i\right]^{-1} \left[\sum_i z_i' \gamma_i\right]$ and $\hat{\mu}_\kappa = \left[\sum_i z_i' z_i\right]^{-1} \left[\sum_i z_i' \kappa_i\right]$. Subsequently, these results can be substituted in the expression for $\gamma_i - z_i \hat{\mu}_\gamma$ and $\kappa_i - z_i \hat{\mu}_\kappa$. A GMM approach can then be applied to estimate $\hat{A}_{GMM}^*$ using high-order sample moments of $\gamma_i - z_i \hat{\mu}_\gamma$ and $\kappa_i - z_i \hat{\mu}_\kappa$, from which $\hat{A}_{GMM}$ is obtained using the expression $\hat{A}_{GMM} = \hat{A}_{GMM}^* - 1$. The estimates for $B^{\dagger}$ and $C^{\dagger}$ are obtained from several simultaneous relations. Substituting

$\hat{A}^*_{GMM}$ and $\mu_\Gamma = \mu_\kappa - C^\dagger$ into $\hat{\mu}_\gamma = \hat{A}^*_{GMM}\mu_\Gamma + B^*$ we obtain:

$$\hat{\mu}_\gamma - (1 + \hat{A}_{GMM}) \left(\hat{\mu}_\kappa - C^\dagger\right) - B^* = 0 \tag{17}$$

We next use Equations (15) and (16) along with $E(\Gamma_i^*) = E(\varepsilon_i^*) = E(\nu_i) = 0$. Taking expectations of (15) and (16) we obtain: $E\Gamma_i + Ez_i\left(C^\dagger - \mu_\kappa\right) + E\nu_i = 0$ and $EA^*\Gamma_i + Ez_i\left(B^* - \mu_\gamma\right) + E\tilde{\varepsilon}_i = 0$, and solving them simultaneously we get:

$$Ez_i\left(\hat{A}_{GMM} + 1\right)\left[\left(C^\dagger - \hat{\mu}_\kappa\right) - \left(B^* - \hat{\mu}_\gamma\right)\right] = 0 \tag{18}$$

We substitute for $B^* = B^\dagger + \hat{A}_{GMM}C^\dagger$, $\hat{\mu}_\kappa = [\sum_i z_i'z_i]^{-1}[\sum_i z_i'\gamma_i]$, $\hat{\mu}_\gamma = [\sum_i z_i'z_i]^{-1}[\sum_i z_i'\kappa_i]$ and the sample average of $n^{-1}\sum_i z_i$ for Ez_i. Subsequently, we have two unknowns ($B^\dagger$ and $C^\dagger$) and two equations, (17) and (18), to get the estimates of $C^\dagger$ and $B^\dagger$.

Moment Conditions: To estimate $\hat{A}_{GMM}$ we use several moment conditions. Let $\dot{\gamma}_i = \gamma_i - z_i\hat{\mu}_\gamma$ and $\dot{\kappa}_i = \kappa_i - z_i\hat{\mu}_\kappa$. Our GMM estimator is based on equations expressing the moments of $\dot{\gamma}_i$ and $\dot{\kappa}_i$ as functions of A and the moments of Γ_i^*, ε_i^*, and ν_i. Moment conditions involve: (a.1) $\mathbb{E}\left(\dot{\gamma}_i^2\right) = A^{*2}\mathbb{E}\left(\Gamma_i^{*2}\right) + \mathbb{E}\left(\varepsilon_i^{*2}\right)$, (a.2) $\mathbb{E}\left(\dot{\gamma}_i\dot{\kappa}_i\right) = A^*\mathbb{E}\left(\Gamma_i^{*2}\right)$, and (a.3) $\mathbb{E}\left(\dot{\kappa}_i^2\right) = \mathbb{E}\left(\Gamma_i^{*2}\right) + \mathbb{E}\left(\nu_i^2\right)$. The left-hand-side quantities in these conditions can be estimated consistently, but there are three equations and four unknown parameters on the right-hand-side. To overcome this underidentification problem, we use the third-order product moment equations, which consist of two equations and two unknowns: (a.4) $\mathbb{E}\left(\dot{\gamma}_i^2\dot{\kappa}_i\right) = A^{*2}\mathbb{E}\left(\Gamma_i^{*3}\right)$, (a.5) $\mathbb{E}\left(\dot{\gamma}_i\dot{\kappa}_i^2\right) = A^*\mathbb{E}\left(\Gamma_i^{*3}\right)$. The system of the form (a.1)–(a.5) now has five equations and five right-hand-side unknowns. A^* can be obtained from (a.4) and (a.5) when $\mathbb{E}\left(\Gamma_i^{*3}\right) \neq 0$ and $A^* \neq 0$. Given A^*, all of the system can be solved for the other parameters. We obtain an overidentified equation by combining (a.1)–(a.5) with the fourth-order product moment equations:

(a.6) $\mathbb{E}\left(\dot{\gamma}_i^3\dot{\kappa}_i\right) = A^{*3}\mathbb{E}\left(\Gamma_i^{*4}\right) + 3A^*\mathbb{E}\left(\Gamma_i^{*2}\right) + \mathbb{E}\left(\varepsilon_i^{*2}\right)$

(a.7) $\mathbb{E}\left(\dot{\gamma}_i^2\dot{\kappa}_i^2\right) = A^{*2}\left[\mathbb{E}\left(\Gamma_i^{*4}\right) + \mathbb{E}\left(\Gamma_i^{*2}\right)\mathbb{E}\left(\nu_i^2\right)\right] + \mathbb{E}\left(\varepsilon_i^{*2}\right)\left[\mathbb{E}\left(\Gamma_i^{*2}\right) + \mathbb{E}\left(\nu_i^2\right)\right]$

(a.8) $\mathbb{E}\left(\dot{\gamma}_i\dot{\kappa}_i^3\right) = A^*\left[\mathbb{E}\left(\Gamma_i^{*4}\right) + 3A^*\mathbb{E}\left(\Gamma_i^{*2}\right)\mathbb{E}\left(\nu_i^2\right)\right]$

The resulting system now has eight equations and six unknowns $\Psi \equiv [A, \mathbb{E}\left(\Gamma_i^{*2}\right), \mathbb{E}\left(\varepsilon_i^{*2}\right), \mathbb{E}\left(\nu_i^2\right), \mathbb{E}\left(\Gamma_i^{*3}\right), \mathbb{E}\left(\Gamma_i^{*4}\right)]'$. Overall, (a.1)–(a.8) can be written as $\mathbb{E}[f_i(\mu)] = c(\Psi)$, where $\mu \equiv vec\left(\mu_\gamma, \mu_\kappa\right)$, $f_i(\mu)$ are the distinct elements of $\dot{\gamma}_i^{r_0}\dot{\kappa}_i^{r_1}$ (with r_0 and r_1 non-negative integers), and the elements of $c(\Psi)$ are the corresponding right-hand sides of (a.1)–(a.8). The sample analog of $f_i(\mu)$ can be written as $g_i(\hat{\mu}) = n^{-1}\sum_{i=1}^n f_i(\hat{\mu})$. Suppose that we have a positive definite matrix $\hat{W}$. Then, the GMM estimator is obtained

by numerically minimizing a quadratic form: $\hat{\Psi}_{GMM} = \arg\min_{\varphi\in\Psi} \left(g_i\left(\hat{\mu}\right) - c(\varphi)\right)' \hat{W} \left(g_i\left(\hat{\mu}\right) - c(\varphi)\right)$. We use the Gauss-Newton algorithm to solve this recursive minimization problem and pool the cross-section estimates using a minimum distance estimator (e.g., Holtz-Eakin, Newey, and Rosen 1988; Arellano and Bond, 1991).

Table 1. Summary Statistics for Stapled and Non-stapled Deals

This table provides summary statistics of data for all firm years used in the analysis. Firm specific factors denote variables corresponding to pre-announcement value. *Target Size* is calculated 63 days prior to bid announcement, measured in $ millions. *Leverage* is book leverage, defined as total debt (long-term debt plus debt in current liabilities), divided by the book value of assets. *Intangibles* is the ratio of intangibles to total assets. *Profitability* is earnings before interest and taxes, divided by the book value of assets. *TEV* is the total enterprise value. *Volatility* is the standard deviation of operating earnings scaled by book assets over the trailing 12 quarters. *Disc. Accruals* are discretionary accruals computed according to Dechow and Dichev (2002). *Stock Turnover* is the stock trading volume divided by market capitalization (for the target firm) before the announcement of bids. *Opacity* is computed according to Bharath et al. (2006). All $ values are in 2002 dollars (purchasing power adjusted using the consumer price index). (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

	(1) Stapled	(2) Non-Stapled	(3) Other Public Deals	(1)-(2) Difference p-value	(1&2)-(3) Difference p-value
Panel A: ***Firm and deal Characteristics***					
Profitability	0.148	0.061	0.050	0.00***	0.00***
Leverage	0.319	0.388	0.233	0.00***	0.00***
Target Size($mm)	2,746	2,022	1,656	0.00***	0.00***
Average Deal Value($mm)	5,260	3,455	2,235	0.01***	0.01***
Total Deal Value($mm)	205,057	469,279	3,943,790	0.00***	0.00***
Average TEV/Revenue	2.11	2.93	3.05	0.04**	0.00**
Average TEV/EBITDA	10.73	12.10	9.92	0.05**	0.08*
Average # of Potential Bidders	43.7	31.6	1.06	0.04***	0.00***
Number of Deals by Transaction Ranges					
# of Deals	45	141	1,764		
Greater than $1 billion	36	76			
$500 - $999.9mm	4	21			
$100 - $499.9mm	4	33			
Less than $100mm	1	11			
Panel B: ***Measures of Information Asymmetry***					
Intangibles	0.498	0.312		0.04**	
Stock Turnover	5.319	7.282		0.09*	
Volatility	0.933	0.620		0.07*	
Opacity	0.356	0.096		0.00***	
Disc. Accruals	0.050	0.031		0.08*	

Panel C*: Most Active Buyers by Total Transaction Size ($mm)*			
Stapled Deals	($mn)	**Non-stapled Deals:**	($mn)
Goldman Sachs Group	81,292.34	TPG Capital	111,350.31
TPG Capital	79,723.34	Blackstone Group	93,688.17
Kohlberg Kravis Roberts & Co	59,216.66	Carlyle Group	74,118.09
Citigroup Private Equity	44,934.22	Kohlberg Kravis & Roberts	65,967.26
Bain Capital Private Equity	24,757.62	Goldman Sachs Group	63,320.08

Table 2. Target Return Measures

This table reports mean and median values of target returns for the sample of stapled and non-stapled deals for matched and unmatched samples. We compute raw (Raw) as well as benchmark-adjusted cumulative (CAR) and buy-and-hold abnormal returns (BHAR) over three different event windows around the announcement date of 0: (i) first measure is taken over day 0 to day +126 after the announcement is made or the delisting date (ii) second measure is calculated from day -42 to day +126 or the delisting date, whichever occurs first (iii) final measure is the three-day raw (Raw3) or market adjusted cumulative abnormal return constructed around one day before and after the announcement took place. We calculate market-adjusted as the sum of daily difference between raw returns and the CRSP value-weighted (VW) or equally-weighted index (EW) returns over the relevant interval. Matched sample results are based on propensity score matching technique where we matched each stapled deal with an non-stapled counterpart based on industry and size. (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

	Unmatched Sample						Matched Sample					
	(1) Stapled		(2) Non-Stapled		(3) Difference		(4) Stapled		(5) Non-Stapled		(6) Difference	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
[0, +126] window												
Raw	0.231	0.268	0.144	0.204	0.061**	0.064***	0.164	0.127	0.100	0.069	0.064***	0.058**
CAR-EW	0.188	0.213	0.112	0.138	0.076***	0.075***	0.090	0.064	0.031	0.026	0.059**	0.038
CAR-VW	0.198	0.223	0.133	0.159	0.065***	0.064**	0.115	0.158	0.082	0.073	0.033	0.085***
BHAR	0.226	0.248	0.164	0.196	0.062**	0.052**	0.137	0.146	0.066	0.059	0.071***	0.087***
BHAR-EW	0.163	0.203	0.092	0.105	0.071***	0.098***	0.166	0.149	0.097	0.088	0.069***	0.061***
BHAR-VW	0.177	0.207	0.110	0.134	0.067***	0.073***	0.173	0.157	0.088	0.093	0.085***	0.064***
[-42, +126] window												
Raw	0.293	0.366	0.240	0.292	0.053**	0.074***	0.187	0.158	0.125	0.082	0.062***	0.076***
CAR-EW	0.272	0.323	0.192	0.241	0.080***	0.082***	0.184	0.159	0.117	0.099	0.067***	0.060***
CAR-VW	0.270	0.335	0.201	0.252	0.069***	0.083***	0.169	0.144	0.088	0.095	0.081***	0.049*
BHAR	0.362	0.346	0.278	0.291	0.084***	0.055**	0.217	0.196	0.146	0.106	0.071***	0.090***
BHAR-EW	0.333	0.268	0.208	0.216	0.125***	0.052**	0.189	0.145	0.107	0.073	0.082***	0.072***
BHAR-VW	0.321	0.230	0.218	0.245	0.103***	-0.015	0.213	0.200	0.109	0.125	0.104***	0.075***
[-1,+1] window												
Raw3	0.213	0.256	0.148	0.162	0.065***	0.094***	0.159	0.063	0.074	0.028	0.085***	0.035
CAR3-VW	0.212	0.250	0.146	0.160	0.066***	0.090***	0.142	0.065	0.068	0.034	0.074***	0.031
CAR3-EW	0.209	0.251	0.146	0.161	0.063**	0.090***	0.126	0.062	0.058	0.034	0.068***	0.028

Table 3. The Effect of Stapled Financing on Shareholders' Gains: Multivariate Regression Results

This table presents coefficient estimates from regressions relating target returns to an array of covariates. BHAR, CAR and CAR3-VW are described in Table 2. Firm specific factors denote variables corresponding to value before the announcement. All dollar values are in dollars of 2002 purchasing power adjusted using the consumer price index. *Relative Size* is defined as the natural log of the equity value of the target divided by the bidder size 63 days before the bid announcement; *Leverage* is book leverage, defined as total debt (long-term debt plus debt in current liabilities), divided by the book value of assets; *Past Stock Return* is the return to the target's stock compounded over 12 months immediately preceding the trading day -42 relative to the announcement date minus the compound return to the CRSP value-weighted market over the same period. *Reputation* measure is based on the market share rank of the dollar volume of merger advising across the years 2002-2011. *Club Bidding* is a dummy variable that equals one for club deal targets, zero otherwise. *Cash* is a dummy variable equal to 1 for acquisitions in which the payment is all cash; *Financial Buyer* is a dummy variable that takes a value of 1 when there are financial buyers in the pool. *Tender (Hostile)* is an indicator variable equal to one if the takeover offer is a tender (hostile) offer, and zero otherwise. *Takeover Defense* is between 0 and 1, with a higher number indicating stronger takeover defenses. *, ** and *** indicate significance at the 10%, 5% and 1% levels.

Table 3 (Continued). The Effect of Stapled Financing on Shareholders' Gains: Multivariate Regression Results

	(1) [-42, +126] BHAR		(2) [-42, +126] CAR		(3) [0, +126] BHAR		(4) [0, +126] CAR		(5) CAR3-VW	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Stapled	0.062***	(2.77)	0.059**	(2.12)	0.068***	(2.80)	0.057**	(2.45)	0.042***	(4.88)
Relative Size	-0.022	(-1.28)	-0.018	(-1.42)	-0.051	(-1.47)	-0.033*	(-1.95)	-0.052*	(-1.76)
Leverage	-0.066*	(-1.82)	0.057	(1.60)	-0.097	(-1.49)	-0.095	(-1.44)	-0.100	(-1.33)
Past Stock Return	-0.050**	(-2.38)	-0.045***	(-2.57)	-0.034**	(-2.23)	-0.038***	(-2.57)	-0.059**	(-2.49)
Reputation	0.016**	(2.33)	0.009**	(2.35)	0.018***	(2.57)	0.010**	(2.16)	0.021**	(2.18)
Number of Bidders	0.008***	(2.88)	0.010**	(2.26)	0.012**	(2.19)	0.013**	(2.15)	0.009*	(1.97)
Tender	0.011**	(2.36)	0.015***	(2.73)	0.019***	(2.58)	0.016**	(2.27)	0.017***	(3.10)
Hostile	-0.009*	(-1.72)	-0.027	(-1.53)	-0.012**	(-2.06)	-0.037*	(-1.69)	-0.033	(-1.51)
Club Bidding	-0.050**	(-2.55)	-0.049***	(-2.50)	-0.053**	(-2.09)	-0.057***	(-2.80)	-0.042***	(-2.76)
Cash	0.011*	(2.15)	0.004***	(2.65)	0.004***	(5.66)	0.003**	(2.23)	0.006*	(1.82)
Financial Buyer	0.009**	(2.01)	0.018**	(2.33)	0.020**	(2.40)	0.014***	(2.66)	0.013**	(2.25)
Takeover Defense	0.071**	(2.15)	0.054*	(1.86)	0.048*	(1.98)	0.064*	(1.73)	0.044***	(2.58)
Adj. R-squared	0.087		0.076		0.082		0.080		0.079	

Table 4. Interaction Effects of Stapled Financing and Information Asymmetry on Shareholders' Gains

This table presents coefficient estimates from regressions relating target returns to measures of asymmetric information interacted with the "Stapled" indicator. BHAR, CAR and CAR3-VW are described in Table 2. Information asymmetry proxies and interaction terms are included separately to the regressions. All dollar values are in dollars of 2002 purchasing power adjusted using the consumer price index. *Intangibles* is the ratio of intangibles to total assets; *Volatility* is measured as the standard deviation of operating earnings scaled by book assets over the trailing 12 quarters. *Disc. Accruals* is from Dechow and Dichev (2002). *Turnover* is the stock trading volume divided by market capitalization for the particular target firm before the announcement. Other controls are as defined in Table 3. (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

Interaction Effects of Information Asymmetry Measures on Shareholders' Gains

	Stapled * Volatility	Stapled * Intangibles	Stapled * Opacity	Stapled * Turnover	Stapled * Disc. Accruals
[0, +126] BHAR	0.058***	0.064***	0.031**	-0.029**	0.035**
	(2.55)	(2.59)	(2.23)	(-2.17)	(2.30)
[0, +126] CAR	0.039***	0.052**	0.044**	-0.035**	0.032**
	(2.32)	(2.28)	(2.47)	(-2.32)	(2.26)
[-42, +126] BHAR	0.044**	0.066***	0.043**	-0.055***	0.030**
	(2.43)	(2.62)	(2.36)	(-2.70)	(2.17)
[-42, +126] CAR	0.035**	0.050****	0.048***	-0.061***	0.016*
	(2.29)	(2.16)	(2.55)	(-2.82)	(1.98)
CAR3-VW	0.028**	0.032*	0.030**	-0.034**	0.040**
	(2.10)	(1.99)	(2.19)	(-2.28)	(2.33)

Table 5. The Effects of Stapled Financing on Shareholders' Gains: Switching Regressions

This table presents the maximum likelihood estimation estimate of Equations (2)-(5) in the text. Panel A presents the results for the propensity to staple finance the deal (selection equation), where the dependent variable is a binary variable that equals one a stapled financing is offered, and zero otherwise. Panel B reports estimation results for the two second-stage outcome equations, one for the stapled group and the other for the non-stapled group. *LnSize* is defined as the natural log of the equity value of the target 63 days before the bid announcement; *InstOwner* is the percentage of firm shares held by institutional investors; *Capital Availability* is the number of banks giving loans in the target firm's immediate area. *Leverage* is book leverage, defined as total debt (long-term debt plus debt in current liabilities), divided by the book value of assets; *Illiquidity* is the measure of stock illiquidity of Amihud (2002). *Credit Spread* is the difference between the yields of BB- versus AAA-rated corporate bonds obtained from Bloomberg. *Volatility* is measured as the standard deviation of operating earnings scaled by book assets over the trailing 12 quarters. *Mkt(t-1)* is the daily return on the value weighted CRSP at time t-1; *Previous Relationships* is a dummy variable that takes a value of 1 if there is a prior advisory and lending relationships between each seller and sell-side advisor before the current deal and 0 otherwise. Other covariates are defined as in Table 3. σ denotes the square-root of the variance of the error terms ε_j for *j=1,2* in the outcome equations (4); ρ denotes the correlation coefficient between the error term *u* of the selection equation (3) and the error term ε_j of the outcome equation (4) for *j=1,2*. *, ** and *** indicate significance at the 10%, 5% and 1% levels.

Panel A: First Stage Results of Endogenous Switching Model

	Marginal Effect	Pr>ChiSq
LnSize	0.043**	(0.04)
Illiquidity	0.022**	(0.02)
Leverage	0.017*	(0.06)
InstOwner	-0.810**	(0.03)
Capital Availability	-0.098***	(0.00)
Volatility	0.422**	(0.03)
Previous Relationships	0.021*	(0.06)
Credit Spread	0.007*	(0.08)
Mkt(t-1)	-0.005*	(0.09)
σ	-0.055	(0.35)
ρ	15.19	(0.00)
Pseudo R-squared	0.067	
Model *p*-value (Likelihood Ratio Test)	0.040	

Table 5 (Continued) The Effects of Stapled Financing on Shareholders' Gains: Switching Regressions

Panel B: Second Stage Results of Endogenous Switching Model

	Stapled LBOs' Abnormal Return Equation						Non-stapled LBO's Abnormal Return Equation					
	(1) [-42, +126] CAR		(2) [0, +126] CAR		(3) CAR3-VW		(4) [-42, +126] CAR		(5) [0, +126] CAR		(6) CAR3-VW	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Relative Size	-0.063	(-1.60)	-0.036**	(-2.28)	-0.035**	(-2.16)	-0.040*	(-1.62)	-0.016	(-1.66)	-0.019	(-1.52)
Leverage	-0.027	(1.58)	0.028*	(1.67)	-0.047*	(-1.86)	-0.086**	(-2.02)	-0.077*	(-1.98)	-0.120	(-2.07)
Past Stock Return	-0.103**	(-2.33)	-0.076**	(-2.12)	-0.062**	(-2.33)	-0.092**	(-2.41)	-0.020**	(-2.30)	-0.050**	(-2.20)
Reputation	0.017	(1.19)	0.018	(1.13)	0.016	(1.20)	0.047***	(2.64)	0.043***	(2.76)	0.052***	(2.61)
Number of Bidders	0.022***	(2.59)	0.020**	(2.06)	0.011***	(2.59)	0.015*	(1.85)	0.018*	(1.97)	0.014*	(1.88)
Tender	0.130**	(2.14)	0.133**	(2.00)	0.098	(1.63)	0.081**	(2.12)	0.100**	(2.24)	0.089**	(2.02)
Hostile	-0.015	(-1.60)	-0.014	(-1.31)	-0.020*	(-1.69)	-0.046	(-1.13)	-0.014	(-1.30)	-0.028	(-1.22)
Club Bidding	-0.050**	(-2.38)	-0.045**	(-2.34)	-0.040**	(-2.29)	-0.049**	(-2.46)	-0.026**	(-2.14)	-0.022*	(-1.86)
Cash	0.010	(1.55)	0.002*	(1.72)	0.006	(1.54)	0.006*	(1.79)	0.008*	(1.91)	0.012	(1.34)
Financial Buyer	0.016**	(2.44)	0.026***	(2.60)	0.029***	(271)	0.016**	(2.32)	0.015**	(2.20)	0.018**	(2.33)
Takeover Defense	0.028**	(2.22)	0.027***	(2.59)	0.034***	(2.65)	0.058**	(2.10)	0.019**	(2.19)	0.016**	(2.30)

Table 6. Pricing Improvement from Stapled Financing

This table presents actual mean CARs and hypothetical mean CARs for stapled and unstapled LBOs for the years 2002-2011. CAR and CAR3-VW are described in Table 2. The computation of these imputed values is discussed in the text.. All variables are measured in percentages. *, ** and *** indicate significance at the 10%, 5% and 1% levels.

Actual versus Hypothetical Abnormal Returns for Stapled and Non-stapled LBOs

	Actual	Hypothetical	*Difference* (Actual-Hypothetical)
Panel A: Comparisons for Stapled LBOs			
[-42, +126] CAR	0.293	0.255	0.032**
[0 +126] CAR	0.231	0.204	0.027*
CAR3-VW	0.213	0.194	0.019*
Panel B: Comparisons for Non-stapled LBOs			
[-42, +126] CAR	0.144	0.191	-0.047***
[0 +126] CAR	0.240	0.278	-0.038**
CAR3-VW	0.148	0.170	-0.022*

Table 7. Pricing Improvement from Stapled Financing Conditional on Information Asymmetry

This table presents actual mean CARs and hypothetical mean CARs for stapled and unstapled LBOs for the years 2002-2011 across targets associated with "High" and "Low" information asymmetry (IA). We use *Volatility* measured as of operating earnings scaled by book assets over the trailing 12 quarters as an asymmetric information proxy. We rank target firms based on their *Volatility* measures a quarter before the announcement date. We label a target firm as "High" ("Low") if the its volatility measure is above (below) the sample median. CAR and CAR3-VW are described in Table 2. The computation of these imputed values is discussed in the text. All variables are measured in percentages. *, ** and *** indicate significance at the 10%, 5% and 1% levels.

Actual versus Hypothetical Abnormal Returns for Stapled and Non-stapled LBOs For High and Low IA Measures

	(1) Actual		(2) Hypothetical		(3) *Difference* (Actual-Hypothetical)	
	High IA	Low IA	High IA	Low IA	High IA	Low IA
Panel A: Comparisons for Stapled LBOs						
[-42, +126] CAR	0.302	0.208	0.269	0.183	0.033**	0.015
[0 +126] CAR	0.242	0.186	0.211	0.172	0.031**	0.014
CAR3-VW	0.222	0.165	0.202	0.154	0.020*	0.011
Panel B: Comparisons for Non-stapled LBOs						
[-42, +126] CAR	0.258	0.120	0.216	0.130	-0.042***	-0.010
[0 +126] CAR	0.282	0.229	0.310	0.252	-0.028*	-0.023*
CAR3-VW	0.153	0.124	0.170	0.135	-0.017*	-0.011

Table 8. Univariate Analysis of the Effect of Stapled Financing on Lending Terms

The table presents summary statistics for buyout capital structure variables for a sample stapled and non-stapled US LBOs completed between January 1, 2002 and October 16, 2011. *Spread* is average all-in-drawn interest spread over six month London Interbank Offered Rate (LIBOR) (in bps) and the average maturity (in months) of loans used in financing our sample deals. The primary source of loan information is the LPC's Dealscan, Standard and Poor's Capital IQ and SDC. We also manually check proxy filings, including schedule 14A, TO-T, S-4 and 13E3, for information on deal financing for all sample deals when these filings are available in Edgar. For each tranche we retrieve information on tranches type, currency, base rate, pricing, maturity, seniority and security. The last column provides p-values for difference in means (p-values for Wilcoxon Rank sum test). (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

	Stapled	Non-Stapled	Difference (p-value)
Capital Structure			
Equity/Capital	37.82	43.01	0.03**
Debt/EBITDA	5.906	4.076	0.09*
Debt Ratios relative to LBO Debt			
Revolvers	7.054	3.540	0.02**
Term Loans	25.98	22.33	0.08*
Senior Bonds and Notes	15.80	22.82	0.04**
Senior Secured Bonds	5.489	12.00	0.03**
Senior Unsecured Bonds	10.32	9.960	0.37
Senior Sub Debt	3.534	2.406	0.19
Junior Sub Bonds and Notes	26.56	23.63	0.11
Junior Sub Debt	2.461	0.674	0.06*
Second Lien Loans	0.000	0.024	0.54
Second Lien Bonds	1.684	0.771	0.26
Spread (bps)			
First-Lien Revolvers	238.01	291.94	0.00***
First-Lien Term A	312.20	359.10	0.08*
First-Lien Term B	277.90	339.42	0.00***
Bridge Loans	457.18	456.13	0.18
Maturity (months)			
First-Lien Revolvers	68.71	64.24	0.09*
First-Lien Term A	75.29	70.77	0.09*
First-Lien Term B	86.09	76.12	0.00***
Bridge Loan	10.75	15.91	0.04**

Table 9. Multivariate Analysis of the Effect of Stapled Financing on Lending Terms

This table reports the determinants of leveraged buyout loan spreads and maturity **using** ordinary least squares regressions at the buyout level. The primary source of loan information is the LPC's Dealscan, Standard and Poor's Capital IQ and SDC. We also manually check proxy filings, including schedule 14A, TO-T, S-4 and 13E3, for information on deal financing for all sample deals when these filings are available in Edgar. Bank Loan involves Term A loans and revolving lines of credit. All dollar values are in dollars of 2002 purchasing power adjusted using the consumer price index. *Loan Spread* is the all-in-drawn spread above benchmark. *Maturity* is length in months between facility activation date and maturity date. *LnSize* is the natural log of the market value of target company calculated 63 days prior to bid announcement, *Past Stock Return* is the return to the target's stock compounded over 12 months immediately preceding the trading day -43 relative to the announcement date minus the compound return to the CRSP value-weighted market over the same period. *Lending Relationships* is the measure of lending relationship strength (between the borrower and lender) which takes a value of 1 if there is a relationship with any of the lead banks in the last 5 years before the present loan and 0 otherwise. *Intangibles* is the ratio of intangibles to total assets. *Volatility* is the standard deviation of operating earnings scaled by book assets over the trailing 12 quarters. *Secured* is a dummy variable that equals one for secured loans, zero otherwise. *Credit Spread* equal the difference between the yields of BB- versus AAA-rated corporate bonds obtained from Bloomberg. *Financial Buyer* is a dummy variable that takes a value of 1 when there are financial buyers in the pool. *Syndicate* is the number of lenders in the syndicate. (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

	(1) Bank Loan Spread		(2) Term B Loan Spread		(3) Senior Spread		(4) Maturity	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Stapled	-42.08***	(-2.94)	-33.11**	(-2.05)	-18.07***	(-2.71)	6.079**	(2.36)
LnSize	-32.05***	(-2.78)	-10.00***	(-2.50)	-22.48**	(-2.33)	8.045***	(2.92)
Leverage	14.31***	(3.25)	16.95**	(2.98)	25.13***	(2.99)	-3.091*	(-1.68)
Past Stock Return	-27.42***	(-3.14)	-29.32**	(-2.49)	-8.030**	(-2.10)	0.635	(0.66)
Intangibles	12.19**	(1.76)	15.14***	(2.62)	29.85***	(5.92)	8.013**	(2.15)
Volatility	4.108	(1.61)	3.091*	(1.69)	-30.01*	(-1.80)	-2.124*	(-1.87)
Lending Relationships	-87.11***	(-2.25)	-46.19***	(-2.77)	-12.76**	(-2.26)	7.144**	(2.12)
Secured	-7.085***	(-2.48)	-5.108***	(-2.97)	-7.096**	(-2.49)	1.091**	(2.10)
Credit Spread	6.045	(1.69)	-4.030	(-1.47)	-8.065*	(-1.97)	-4.063	(-0.66)
Financial Buyer	5.014**	(2.16)	5.520**	(2.10)	9.020*	(1.94)	-0.911***	(-2.80)
LnSyndicate	-0.030*	(-1.98)	-0.027*	(-1.86)	-0.016*	(-1.69)	0.020*	(1.77)
Adj. R-squared	0.318		0.399		0.328		0.089	

Table 10. Counterfactual Analysis for Loan Terms

The table presents actual mean loan terms, hypothetical mean loan terms for stapled and unstapled LBOs, calculated via endogenous switching regressions model for the years 2002-2011. The first step in the model is the maximum likelihood estimate of Equations (2)-(5) in the text. The computation of these imputed values is discussed in the text. All variables are measured in percentages. *, ** and *** indicate significance at the 10%, 5% and 1% levels.

Actual versus Hypothetical Loan Terms for Stapled and Non-stapled LBOs

	Actual	Hypothetical	Difference (Actual-Hypothetical)
Panel A: Comparisons for Stapled LBOs			
Bank Loan Spread	275.1	318.9	-43.8***
Term B Loan Spread	277.9	304.2	-26.3**
Senior Spread	289.3	320.1	-30.8**
Maturity	71.8	64.0	7.8**
Panel B: Comparisons for Non-stapled LBOs			
Bank Loan Spread	325.5	289.1	35.8***
Term B Loan Spread	339.4	296.2	43.2***
Senior Spread	328.3	301.4	26.9**
Maturity	60.1	67.8	-7.7**

Table 11. Advisory Fees and Stapled Financing

This table reports coefficient estimates from an analysis relating advisory fees paid by targets and stapled financing. Dependent variable is the percentage of fees paid by the target relative to transaction value *(% Fees*) or natural logarithm of the dollar amount (in $ million) of fees paid by the target. *Log($ Fees). LnSize* is defined as the natural log of the equity value of the target 63 days before the bid announcement; *Tender (Hostile)* is an indicator variable equal to one if the takeover offer is a tender (hostile) offer, and zero otherwise. *SameSIC* is equal to 1 if both the target and the acquiring firms are in the same business line (same SIC codes), and 0 otherwise; *Reputation* measure is based on the market share rank of the dollar volume of merger advising across the years 2002-2011. *SameAdv* is equal to 1 if at least one of the advisors was advising both the target and the acquiring firms for the deal; *Previous Relationships* is a dummy variable that takes a value of 1 if there is a prior advisory and lending relationships between each seller and sell-side advisor before the current deal and 0 otherwise. *Mkt(t-1)* is the daily return on the value weighted CRSP at time t-1. (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

Dependent variable:	% Fees		Log($ Fees)	
	Estimate	t-stat	Estimate	t-stat
Stapled	0.012*	(1.76)	0.007	(1.62)
LnSize	0.017***	(3.79)	0.029***	(2.55)
Tender	0.135**	(2.28)	0.090**	(2.02)
Hostile	-0.026*	(1.76)	-0.057	(-1.16)
SameSIC	-0.015**	(-2.02)	-0.062**	(-2.33)
Number of Advisors	-0.098*	(-1.98)	0.056*	(-1.72)
Reputation	0.156***	(2.80)	0.219***	(2.90)
SameAdv	-0.016	(-1.13)	-0.048	(-1.55)
Previous Relationships	-0.035*	(-1.99)	-0.030*	(-1.88)
Mkt(t-1)	0.005*	(1.77)	0.000	(1.59)
Adj. R-squared	0.302		0.277	

Table 12. Effect of Stapled Financing on the Intensity of Bidding Competition

This table reports the regression results where the dependent variables are six different proxies of bidding competition. Data on bidding competition is hand collected from DEFM14A and PREM14A proxy filings and news sources. *Contact* is the number of potential bidders with which the target and its investment bank were in contact. *Confidential* is the number of potential bidders that engaged in a confidentiality or standstill agreement with the target. *Offer* is the number of potential bidders submitted a formal binding offer and *PostDummy* is an indicator variable which equals one when another potential acquirer bids for the target six months after the deal announcement is made. We also use two additional proxies for the intensity of bidding competition. First measures how much the final offer price exceeds the initial bid price (*%BidPrice*). Second measure is the number of times the bid price is revised by potential acquirers (*Revision*). All dollar values are in dollars of 2002 purchasing power adjusted using the consumer price index. *Illiquidity* is the measure of stock illiquidity of Amihud (2002). *InstOwner* is the percentage of firm shares held by institutional investors. *MarketBook* is the ratio of market value to book value of assets. *Takeover Defense* is between 0 and 1, with a higher number indicating stronger takeover defenses. *Financial Buyer* is a dummy variable that takes a value of 1 when there are financial buyers in the pool. (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

	(1) Contact		(2) Confidential		(3) Offer		(4) PostDummy		(5) %BidPrice		(6) Revision	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Stapled	2.050	(1.47)	1.079	(1.25)	1.952	(1.39)	0.551*	(1.88)	0.066**	(2.47)	3.127**	(2.10)
Illiquidity	-0.952*	(-1.78)	-0.111*	(-1.85)	0.206	(1.32)	0.129	(1.04)	0.012	(1.20)	1.032	(1.28)
MarketBook	0.519***	(2.62)	0.230**	(2.10)	0.104	(1.58)	0.118*	(1.67)	0.205**	(2.02)	0.412**	(2.44)
InstOwner	0.825**	(2.16)	1.070***	(2.58)	0.538***	(2.77)	0.712***	(2.65)	0.435**	(2.16)	0.049**	(2.33)
Takeover Defense	0.105*	(1.72)	0.086	(0.58)	0.090	(1.51)	0.124*	(1.96)	0.045	(1.32)	0.107*	(1.89)
Financial Buyer	1.067**	(2.14)	1.285**	(2.02)	1.002**	(2.19)	0.975***	(1.93)	0.807*	(1.74)	1.466**	(2.47)
Adj. R-squared	0.119		0.115		0.117		0.139		0.130		0.116	

(Note: Tables A1-A4 are for the review process only.)

TableA1. Difference between Actual versus Hypothetical Abnormal Returns for Stapled and Non-stapled LBOs across High and Low IA Measures

This table replicates Column 3 of Table 6 for different measures of information asymmetry (AI). We use *Intangibles, Opacity, Turnover and Disc. Accruals (defined in Table A.1)* as asymmetric information proxies. We rank target firms based on their IA measures a quarter before the announcement date. We label a target firm as "High" ("Low") if the its AI measure is above (below) the sample median. CAR and CAR3-VW are described in Table 2. The computation of these imputed values is discussed in the text. All variables are measured in percentages. *, ** and *** indicate significance at the 10%, 5% and 1% levels.

Measures of Information Asymmetry:	Intangibles		Opacity		Turnover		Disc. Accruals	
	High IA	Low IA	High IA	Low IA	High IA	Low IA	High IA	Low IA
Panel A: Comparisons for Stapled LBOs								
[-42, +126] CAR	0.030**	0.012	0.035**	0.016	0.028*	0.013	0.032**	0.020*
[0 +126] CAR	0.026*	0.010	0.029*	0.014	0.022*	0.011	0.029*	0.019*
CAR3-VW	0.023*	0.009	0.026*	0.012	0.019*	0.009	0.025*	0.014
Panel B: Comparisons for Non-stapled LBOs								
[-42, +126] CAR	-0.029**	-0.008	-0.040***	-0.015	-0.041***	-0.013	-0.037***	-0.018*
[0 +126] CAR	-0.021*	-0.012	-0.032**	-0.014	-0.025*	-0.016	-0.032**	-0.015
CAR3-VW	-0.009	-0.007	-0.019*	-0.012	-0.018*	-0.009	-0.020*	-0.012

Table A2. GMM Estimates of the Effect of Stapled Financing on the Intensity of Bidding Competition

This table reports the GMM estimates (using a model with latent common factors) of the impact of stapled financing on bidding competition. In Panel A, the dependent variable is the stapled financing, and in Panel B it is the measures of bidding competition. Data on bidding competition is hand collected from DEFM14A and PREM14A proxy filings and news sources. *Contact* is the number of potential bidders with which the target and its investment bank were in contact. *Confidential* is the number of potential bidders that engaged in a confidentiality or standstill agreement with the target. *Offer* is the number of potential bidders submitted a formal binding offer. We also use two additional proxies for the intensity of bidding competition. First measures how much the final offer price exceeds the initial bid price (*%BidPrice*). Second measure is the number of times the bid price is revised by potential acquirers (*Revision*). All dollar values are in dollars of 2002 purchasing power adjusted using the consumer price index. Other controls are defined in Tables 4 and 10. (*), (**), and (***) indicate significance at the 10%, 5%, and 1% levels, respectively. *p*-values of *J*-tests of the overidentifying are also provided.

	(1) Contact		(2) Confidential		(3) Offer		(4) %BidPrice		(5) Revision	
Panel A: Stapled Financing	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
LnSize	0.039**	(2.22)	0.020*	(1.96)	0.034**	(2.18)	0.028**	(2.00)	0.019*	(1.72)
Illiquidity	0.048**	(2.43)	0.063***	(2.70)	0.049***	(2.44)	0.080**	(2.88)	0.051	(2.55)
Leverage	0.010**	(1.79)	0.014*	(1.88)	0.012***	(1.80)	0.026**	(2.07)	0.020**	(2.01)
InstOwner	-0.506**	(-2.14)	-0.337*	(-1.75)	-0.288	(-1.24)	-0.168	(-1.21)	-0.226	(-1.14)
Capital Availability	-0.022*	(-1.80)	-0.002	(-1.06)	-0.012*	(-1.98)	-0.020*	(-1.69)	-0.022*	(-1.80)
Volatility	0.319**	(2.19)	0.232*	(1.89)	0.126	(1.76)	0.110	(1.39)	0.287**	(2.02)
Previous Relationships	0.025**	(2.07)	0.070***	(2.58)	0.038**	(2.27)	0.012*	(1.69)	0.033**	(2.16)
Credit Spread	0.016**	(2.14)	0.010*	(1.98)	0.003**	(1.36)	0.015**	(2.10)	0.006	(1.25)
Panel B: Bidding Competition										
Stapled	2.118**	(2.16)	1.070***	(2.58)	2.038***	(2.77)	0.061***	(2.65)	2.935**	(2.16)
Illiquidity	-0.805*	(-1.72)	-0.206	(-1.60)	-0.010	(-0.51)	-0.404	(-1.56)	-0.605	(-1.62)
InstOwner	0.908**	(2.01)	1.091**	(2.39)	0.861*	(1.80)	0.924**	(2.07)	0.660	(1.19)
MarketBook	1.006***	(2.80)	0.930***	(2.56)	0.304**	(2.11)	0.618**	(2.33)	0.505	(2.24)
Takeover Defense	0.319*	(1.76)	0.144*	(1.92)	0.548***	(2.02)	0.813**	(2.25)	0.769**	(2.16)
Financial Buyer	1.467***	(2.14)	1.085***	(2.06)	1.382***	(2.19)	0.775*	(1.73)	1.067**	(2.04)
J-test (*p*-value)	0.169		0.148		0.124		0.119		0.155	

Table A3. Target Return Measures with 2012 Sample

This table replicates Table 2 using sample between 2002 and 2012 and reports mean and median abnormal return differences between stapled and non-stapled deals (cf. Columns 3 and 6 of Table 2). BHAR, CAR and CAR3-VW are described in Table 2. Matched sample results are based on propensity score matching technique where we matched each stapled deal with an non-stapled counterpart based on industry and size. (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

	Unmatched Sample		Matched Sample	
	(1) Difference		(2) Difference	
	Mean	Median	Mean	Median
[0, +126] window				
Raw	0.058**	0.066***	0.069***	0.055**
CAR-EW	0.072***	0.074***	0.062**	0.037
CAR-VW	0.066***	0.068**	0.034	0.082***
BHAR	0.065**	0.055**	0.074***	0.086***
BHAR-EW	0.069***	0.094***	0.069***	0.061***
BHAR-VW	0.066***	0.072***	0.087***	0.066***
[-42, +126] window				
Raw	0.055**	0.078***	0.062***	0.077***
CAR-EW	0.081***	0.085***	0.066***	0.062***
CAR-VW	0.069***	0.082***	0.079***	0.050*
BHAR	0.083***	0.057**	0.072***	0.090***
BHAR-EW	0.120***	0.050**	0.080***	0.074***
BHAR-VW	0.102***	-0.009	0.099***	0.076***
[-1,+1] window				
Raw3	0.066***	0.092***	0.088***	0.036
CAR3-VW	0.066***	0.088***	0.076***	0.031
CAR3-EW	0.065**	0.090***	0.069***	0.030

Table A4. Signaling with Ex-ante Loan Terms

This table replicates Table 3 using the ex-ante loan terms as stated in the debt commitment letters. *Spread* is the all-in-drawn spread above benchmark. *Maturity* is length in months between facility activation date and maturity date. *(Spread<=q50)* is a dummy equal to one if a loan spread is below the sample median. *(Maturity<=q50)* is a dummy equal to one if loan maturity is below the sample median. Other controls include those defined in Table 3, as well as *(Spread<=q50)* and *(Maturity<=q50)* dummies. (*), (**) and (***) indicate significance at the 10%, 5% and 1% levels.

	(1)		(2)		(3)		(4)		(5)	
	[-42, +126] BHAR		[-42, +126] CAR		[0, +126] BHAR		[0, +126] CAR		CAR3-VW	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Stapled	0.057***	(2.55)	0.052**	(2.21)	0.060***	(2.59)	0.049**	(2.35)	0.038***	(3.89)
Stapled*(Spread<=q50)	0.008	(1.59)	0.010*	(1.68)	0.007	(1.54)	0.010*	(1.69)	0.004	(1.37)
Stapled*(Maturity<=q50)	-0.010*	(-1.70)	-0.009	(-1.63)	-0.010*	(-1.69)	-0.012*	(-1.72)	-0.005	(-1.46)

Figure 1: A Typical Stapled Financing Deal

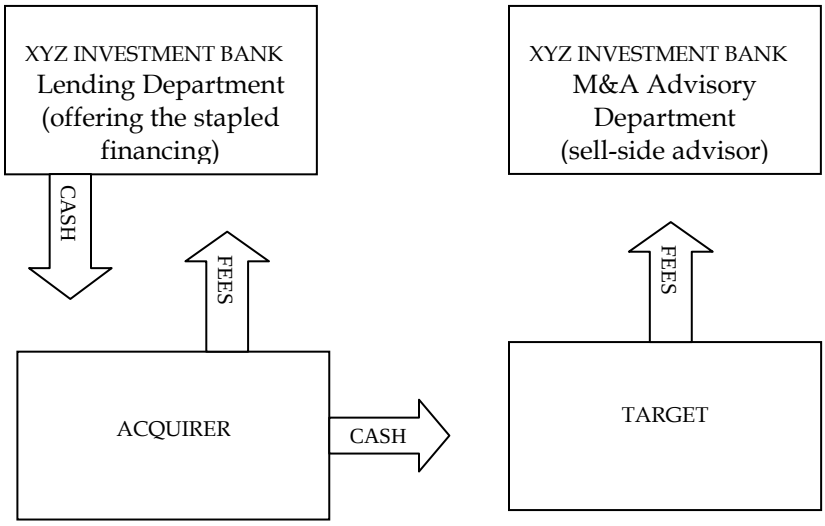

Figure 2: Sample Distribution of Stapled and Non-stapled LBO Deals by Year

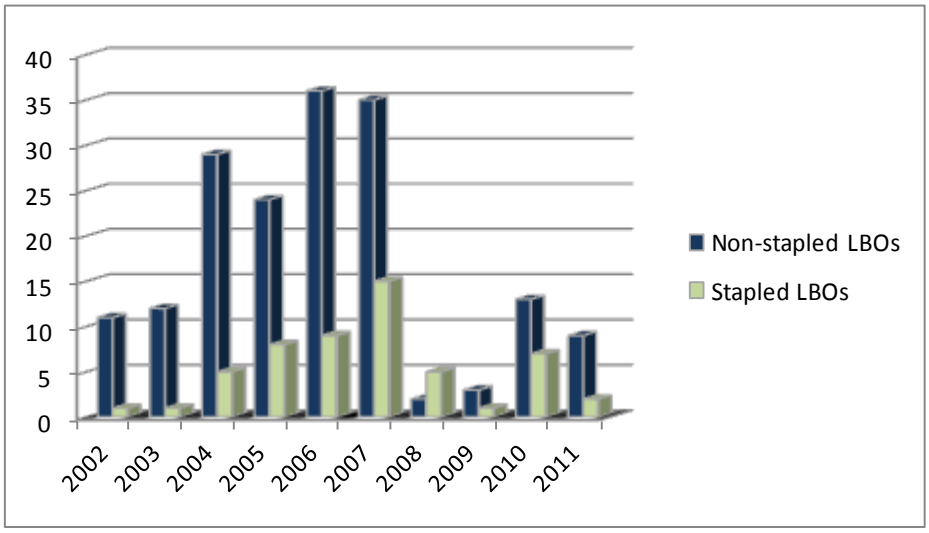

Figure 3 Average Stapled and Non-stapled LBO Deal Size by Year

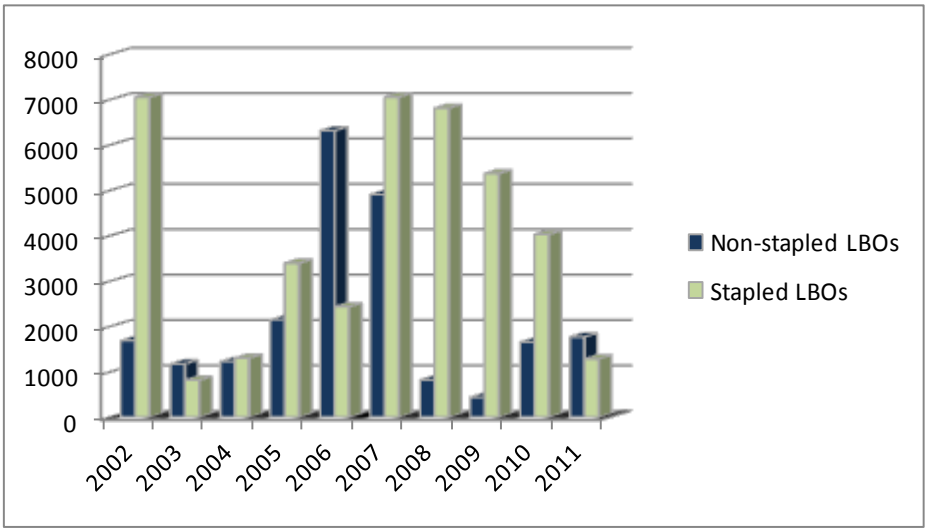

Figure 4 Distribution of Financial Advisors that Offered Stapled-financing

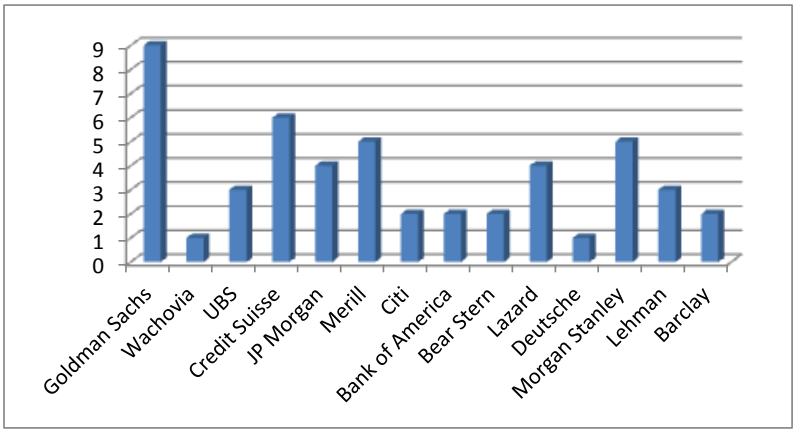

Figure 5 Propensity Scores for stapled-target (treated), non-stapled controls (matched non-treated)

This figure provides an illustration of the propensity score matching approach. The two densities plotted in the figure depict the predicted probability, i.e. propensity score, of being offered a stapled package for our sample firms (blue), and control firms (red) within the same industry and size-decile in year t-1.

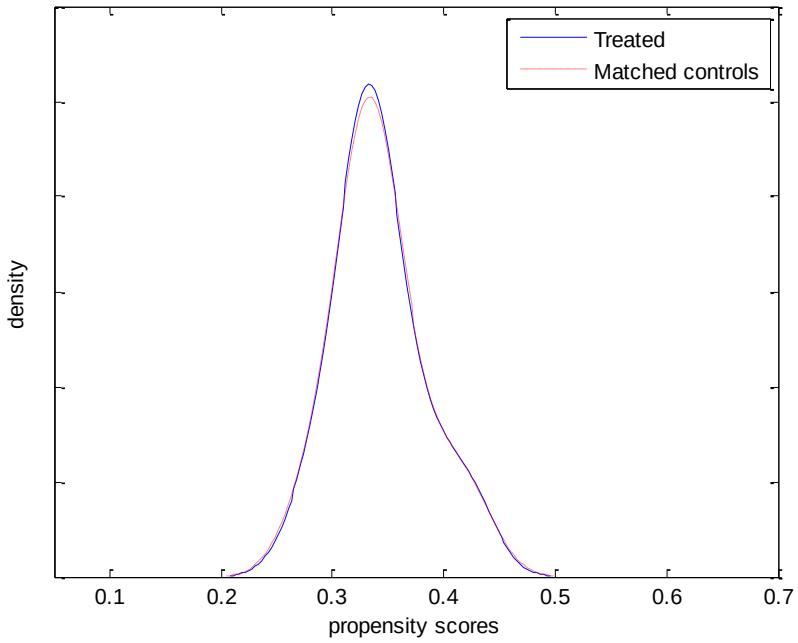

Figure 6 Cumulative Abnormal Returns around the Event Day for Stapled and Non-stapled LBOs