Stapled Financing, Value Certification, and Lending Efficiency[1]

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Abstract

These papers examines whether financing commitments from a target firm's financial advisor, in the form of stapled financing, serve as a certification of target value or instead generate lending business for the investment bank. Using a unique dataset on LBOs during 2002-2011 and addressing endogeneity issues, we find that stapled financing has significant positive effects on sellers' shareholder wealth, especially for targets that suffer from greater adverse selection, and allows buyers to obtain lower cost and longer maturity debt financing. Investment banks offering stapled financing appear to trade off higher expected advisory fees against loss of lending efficiency ex post.

Keywords Stapled finance, Value Certification, Lending Efficiency, Advisory fees

JEL classification codes: G34, G24, G14

I. 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) and reducing the agency costs from incomplete information (Leland and Pyle (1977), Diamond (1984), Allen (1990)). The credibility of these valuation signals is a crucial issue, however. The literature emphasizes reputation as a disciplining mechanism for financial intermediaries against the temptation of strategically manipulating their certification role.[1] However, reputation costs may generally not resolve the credibility of information generation by intermediaries. The transactions cost based contracting approach (Coase, (1937), Williamson (1975)) then suggests that intermediaries will have incentives for contractual innovations that strengthen the credibility of their value signals and improve their expected payoffs from the acquisitions process.

Stapled financing is a relatively recent financial contracting innovation — introduced only at the beginning of the last decade — that played a significant role in M&A during the leveraged buyout (LBO) boom of 2004-2007 and during the financial crisis of 2009. In this arrangement, the seller pre-arranges a financing commitment from its advisors (investment banks) as an option for potential buyer.[2] There are several aspects of stapled financing that appear conducive to a credible certification role from the viewpoint of the standard signaling framework (Spence (1973), Riley (1979)). Stapled financing is a (financing) commitment provided publicly at the discretion of an informed intermediary. However, this commitment is costly for the bank in terms of expected lending losses because buyers will only exercise the financing option if they cannot find better financing terms elsewhere (Povel and Singh

[1] 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).

[2] 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.

(2010)). But the bank can benefit from providing this costly public signal because of higher expected sale prices and commission rates. 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.[3]

However, stapled financing has also raised concerns that rather than serving a certification role it can be used to generate lending business for banks. The concerns are highlighted by the 2010 lawsuit filed by the shareholders of Del Monte Food Company against the company and its financial advisor Barclays Capital during the company's proposed acquisition by a group of private equity investors. The lawsuit alleged that Barclays, which had offered stapled financing, suffered a conflict of interest in favoring buyers who would exercise the financing option (Chon and Das (2011)).[4] More generally, this controversy reflects the tension that arises when financial intermediaries perform both a value certification and a financing function.[5] It is important therefore to examine whether stapled financing actually has significant value certification effects. But the academic literature on stapled financing is just beginning to emerge. To our knowledge, there is no available empirical examination of the effects of stapled financing on value certification of targets, the bidding process, and the expected advisory fees of investment banks.[6]

In this paper, we perform such an analysis using a unique hand-collected dataset on

[3]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 board noted publicly, "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."

[4]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."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 from lending by commercial banks (see Puri (1996)).

[6]The literature has only recently begun to study specific aspects of stapled financing. For example, Boone and Mulherin (2008) and Povel and Singh (2010) examine the effects of stapled financing on the intensity of bidding competition.

stapled financed acquisitions of U.S. public firms during 2002-2011. We find that staple financing is concentrated in leveraged buyouts (LBOs), which is consistent with the significant use of stapled financing during the LBO boom of 2001-2007. Indeed, the use of stapled financing in acquisitions by public firms is exceedingly rare, even in large deals. This is perhaps not surprising because we expect financing commitments by banks to be most relevant to large deals with private buyers since public acquirers have access to other funding sources. Our analysis therefore uses a comprehensive sample of LBOs of U.S. public firms between January 2002 and October 2011.

Although LBO targets tend to be larger, older, and more levered compared with those in public acquisitions (Bargeron et al. (2008)), we nevertheless find substantial heterogeneity in our sample with respect to empirical proxies for valuation uncertainty and agency costs from asymmetric information. Sellers receiving stapled finance packages exhibit both greater valuation uncertainty and higher information asymmetry compared with non-stapled targets. Strikingly, the stapled targets have lower average leverage compared with the non-stapled targets, even though the former are on average larger and more profitable than the latter. This suggests that higher intrinsic valuation uncertainty and asymmetric valuation raises the costs of debt for the stapled targets, in line with corporate finance literature (Myers (1977)). Hence, stapled finance may certification for higher debt capacity (or low intrinsic costs of debt); this type of certification may be especially valuable in the LBO setting.

However, analyzing the pricing effects of stapled financing poses challenging identification problems. This is because, under the value certification hypothesis, the decision to provide stapled financing by informed financial advisors will depend on non-observable factors that are correlated with the acquisition price. To address these concerns, we use an endogenous switching regressions model, which is a generalization of the classical Heckman (1979) two-stage procedure, to provide estimates of the pricing and financing cost improvements from the certification effects of stapled financing.

We find that stapled financing has significant certification effects. 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 non-stapled deals. Moreover, controlling for endogeneity effects, the CARs for stapled deals are 3.2% greater than hypothetical non-stapled deals. Conversely, non-stapled deals would on average obtained 3.8% higher abnormal returns if they had received stapled financing. However, controlling for endogeneity, there is significant improvement in the post-announcement abnormal returns from stapled financing only for targets with higher levels of information asymmetry. And these improvements are economically significant. For example, target firms with high levels of discretionary accruals or intangible assets — both proxies for asymmetric information — earn about 4.5% higher post announcement abnormal returns with stapled financing.

But if the presence of stapled financing is a credible valuation signal, then its effects should be evident in the debt structure and financing costs of buyers even if they do not exercise the financing option. Indeed, we find that buyouts with stapled financing have lower loan costs compared with similar non-stapled deals, even though the stapled buyouts have a more aggressive debt structure. For example, stapled financing ceteris paribus reduces the costs of bank loans by 15% (based on the sample mean of the originating loan spreads) and allows longer maturities of term loans compared with the hypothetical situation of no stapled financing.

In a signaling framework, the provision of a costly signal — in this case the stapled financing commitment — can only be incentive compatible for the informed banks if it generates positive expected payoffs (net of the expected lending costs). We indeed find that banks offering stapled financing receive higher commission rates on deal completions — that is, receive a higher percentage of transactions values as fees — compared with non-stapled deals. Ceteris paribus, targets in stapled financed deals paid 1.2% higher commission rates for success fees compared with non-stapled deals. Thus, banks offering stapled financing

raise their expected advisory fees in two ways: by negotiating higher commission rates and by raising the expected sales price through the certification effect.

In sum, we find that stapled financing has a significant value certification effect, moderating significantly the adverse selection discount on sale prices and lowering the debt financing costs of acquisitions. In particular, stapled financing appears to certify a higher debt capacity for relatively under-levered targets, which facilitates deal financing. Our analysis supports the predictions of a signaling framework where informed intermediaries in M&A certify the economic and financial strength of targets by providing ex ante financing commitment.

We also examine whether stapled financing reduces the intensity of bidding competition, in light of the concerns regarding banks' conflicts of interest. Stapled financing is related significantly and positively to various proxies for the intensity of bidding competition used in the literature (Officer et al. (2010), Boone and Mulherin (2011)). Ceteris paribus, the difference between the final and initial offer prices is about 5% higher for stapled deals compared with non-stapled deals. And, on average, stapled deals have 3 more bid revisions during the sale process. Indeed, the presence of stapled financing 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. Thus, our analysis does not indicate significant reduction in bidding competition for targets receiving stapled financing. However, the higher number of bidders for stapled deals are consistent with greater value uncertainty for stapled targets (French and McCormick (1984)). The results are also 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.

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 asymmetric information on corporate security design — especially debt securities (Roberts and Sufi (2009)). Our study documents the significant economic im-

pact of financial contracting innovations by informed financial intermediaries in the market for corporate control. Our analysis is also consistent with the view that financial contracting will be motivated by the minimization of agency costs of asymmetric information (Coase (1937), Jensen and Meckling (1976)).

We note that stapled financing has both a value certification role and potentially generates lending business for the offering banks. But whereas ex post efficiency would require that the stapled finance contract be contingent on the buyer's characteristics, such state-contingent lending terms may dilute the financing commitment that is central to the credibility of the signal. We indeed find that stapled financing contracts by banks appear to trade off lending efficiency ex post with higher expected advisory fees ex ante. Our study thus 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), Allen and Peristiani (2007)).

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 (Beatty and Ritter (1986), Nanda and Yun (1997)). In contrast to institutional reputation, which encompasses the diverse business activity of financial institutions (Tinic (1988), James (1992)), stapled financing contracts are deal-specific. Our study thus exploits the opportunity to provide direct evidence on the significance of information production by financial intermediaries in the M&A process. Our results suggest that stapled financing can be a substitute for institutional reputation. Furthermore, stapled financing appears particularly effective in certifying lower intrinsic costs of debt for selected targets. Finally, our analysis is related 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)).[7]

[7]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.

II. Theoretical Motivation and Hypotheses Development

In this section, we theoretically motivate a certification role for stapled financing and derive some attendant empirical hypotheses that we subsequently test. To this end, we interpret stapled financing in the context of the Spence-Riley signaling framework. We model buyers' uncertainty about sellers' value by a parameter $\theta \in \Theta \equiv [\theta_\ell, \theta_h]$ that is privately known by the sellers and their investment banks. Higher θ firms are more desirable for buyers, and thus θ has a broad interpretation. In particular, it could represent high expected cash flows and/or low intrinsic costs of external financing — for debt or equity — of targets.

Further, $F \in \{S, NS\}$ is a binary indicator that represents the decision to offer stapled financing (S) or not (NS). In practice, the stapled financing offer is a commitment (or contract) that generally obligates the bank to provide financing under specified conditions if the buyer decides to exercise the option.[8] However, buyers will only exercise the financing option if they cannot find better financing terms elsewhere, so that the bank will generally make expected losses on the financing (Povel and Singh (2010)).[9] Let $C(\theta, F)$ be the expected cost to the investment bank conditional on the firm's true value and the stapled offer decision. Then $C(\theta, S) > C(\theta, NS)$ if there is a positive probability that the financing option will be exercised.[10] Finally, let $A(\theta, P, F) \geq 0$ be the expected advisory fees to the bank from the sale process. Industry practice typically ties 'success' fees in an asset sale to the final value of the transaction. Therefore, A will be increasing in the final transaction price P. Moreover,

[8] 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.

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

[10] This condition is typically met in practice. For example, in our sample (see Section III), over 40% of stapled offers were exercised.

we expect A to be cetris paribus higher if the investment bank offers stapled financing. For instance, the bank may be able to extract higher commission rates from the seller because of the potential lending costs of stapled financing. And because the bank knows the true value of the seller, the negotiated advisory fees may also depend on θ.

The bank's expected utility function is thus $U(\theta, F, A) = A(\theta, P, F) - C(\theta, F)$, where A is increasing in P and $A(\cdot, \cdot, S) > A(\cdot, \cdot, NS)$. Because the signal in this stylized set-up is binary, if stapled financing plays a certification role, then the final transaction price function $P^*(F)$ is such that $P^*(S) > P^*(NS)$, other things held fixed. Based on standard arguments (Riley (1979)), such an equilibrium will 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; that is, the difference

$$\Delta(\theta, F) \equiv U(\theta, S, A(P^*(S), S)) - U(\theta, NS, A(P^*(NS), NS)) \tag{1}$$

is increasing in θ. In particular, if $\Delta(\theta_\ell, F) < 0$, then under the conditions (1)-(3) 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 $\mathbb{E}[\theta \,|\, \theta > \theta^*] > \mathbb{E}[\theta \,|\, \theta \leq \theta^*]$.

The sufficient conditions for stapled financing to have a value certification role appear plausible. Condition (1) will apply because the bank prefers higher fees and its expected payoffs will be increasing in θ (the quality of the seller's assets) for a variety of reasons. First, the repayment risk from the buyer (if it exercises the financing option) will be negatively related to θ. Second, the expected bids will be increasing with θ because potential buyers typically develop their own information, which will be positively related to the true θ. Third, the advisory fees — as a percentage of transaction price — may also be positively related to θ because sellers with higher value benefit more from the certification effects of stapled

financing. Next, as we have mentioned, condition (2) will be satisfied whenever there is a positive probability that the buyer will exercise the stapled option. Finally, condition (3) will be satisfied if the bank obtains greater net benefit from offering stapled financing to the buyers of sellers with higher θ, which appears reasonable.

Note that in the signaling equilibrium stapled financing will be associated with both a positive value impact and higher commission rates. What is important for the value certification role of stapled financing is that the *expected* price improvement for targets exceeds the higher advisory fees paid to banks to obtain stapled financing.[11] In equilibrium, firms that do not obtain the stapled financing certification receive lower value because they are assumed to belong to the low quality set — the adverse selection discount. If this discount is sufficiently large, then good quality sellers still derive positive expected benefits from stapled financing even after paying higher commission rates. This situation is similar to other contexts where good quality firms have to bear dissipative costs to distinguish themselves, such as firms that bear higher taxation costs when they raise dividends to signal good prospects (Bhattacharyya (1979), Ambrish et al. (1985)). Meanwhile, banks offering stapled financing trade-off the gains from higher expected advisory fees against expected lending losses on loans to buyers (if they exercise the financing option). de-off for investment banks regarding the design of the stapled financing contract. Ex post efficiency would require that the stapled offer be made contingent on the buyer's characteristics. However, such contingent lending terms may dilute the advisor's commitment and reduce signal credibility, lowering expected advisory fees.

From an empirical viewpoint, the 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.

[11] More formally, let $\bar{P}(F)$ represent the transaction 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 similarly for $P^*(NS)$. Hence, it is possible that $P^*(S) > P^*(NS)$ and that the expected advisory fees for stapled firms exceed those of non-stapled firms, as long as $\bar{P}(S) - \bar{P}(NS)$ is sufficiently high.

Second, we expect significant price improvement from staple financing, other things held fixed. 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.[12] Finally, we expect advisory fees as a proportion of final sales price to be higher for stapled deals.

More generally, 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 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.

III. Data and Sample Characteristics

A. Sample Selection

Figure 1 graphically depicts a typical stapled financing acquisitions deal. In our sample construction, we attempt to capture instances in which prearranged financing terms are included in offering memoranda by sellers seeking bids. Most observers agree that significant stapled financing activity started following the economic recession and financial market disruptions in 2001, following which credit standards tightened considerably and private equity buyers found it difficult to obtain financing for their deals. This view appears confirmed by

[12] 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.

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.

To access information on sellers' financial characteristics and to analyze the announcement effects of stapled financing on their shareholders' wealth, we focus on acquisitions of public targets. Hence, we construct our initial sample using all M&A announcements between 1/1/2002-10/16/2011 of U.S. incorporated public firms that were subsequently closed or successful. However, we find that stapled financing is concentrated in leveraged buyouts (LBOs) that are typically undertaken by private equity investment firms. Financing commitments would appear to be most relevant for such transactions because public firm acquirers have alternative sources of financing. In fact, in our sample period, we find only one stapled financing deal in the top 50% (above median) of public acquisitions, when sorted by deal size. This is striking because one would expect financing commitment to play a significant economic role only in relatively large deals.

We therefore focus on the effects of stapled financing in LBOs. Starting with *all* closed deals labeled "LBO" in the Securities Data Company (SDC) U.S. mergers and acquisitions database (complemented with Standard and Poor's Capital IQ database) where the targets were U.S. incorporated public firms during our sample period, we identify stapled financed deals by scanning several sources[13] and confirm 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 obtain the names of the targets, advisors, potential bidders, bid and offer prices, transaction size, details of staple financing packages, and other deal related information. We get details on transaction debt financing from Dealscan, SDC and Capital IQ, as well as manually from proxy filings.

Our initial sample has 75 stapled and 209 non-stapled deals. We employ additional filters utilized in the literature (e.g., Officer et al. (2010)). Namely, we require that the acquirer

[13]These sources include Financial Times, Wall Street Journal, Dealbook.com, Proquest, LexisNexis, Factiva, and the SEC's Edgar database.

should control 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. 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.[14] After eliminating observations with transaction value less than $50 million (in 2002 dollars), missing transaction values and missing target asset values, we have 45 stapled and 141 non-staple-financed deals.

The literature offers a diversity of motives and sources of value creation in LBOs — ranging from efficiency improvements and reduction of agency costs (Jensen (1986)) to advantages from tax shields to financial restructuring. In our sample, there are 7 strategic buyers each of whose immediate parent is a private equity firm (or a group of private equity firms) that wholly own(s) the strategic bidding company. Moreover, 19 buyers of stapled deals exercised the financing option and three of these 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.[15]

B. Sample Characteristics

I. Target Financial and Deal Characteristics

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

[14] 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 successful: 9819; and, (5) Target was a public firm: 284.

[15] 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. We will discuss the recent decline in stapled financing in relation to the value certification hypothesis in Section X.

LBOs with targets in other (non-LBO) public deals.[16] Following Bargeron et al. (2008), we calculate the market value of targets' equity 63 trading days prior to the announcement (in 2002 dollars). Targets in stapled deals are significantly larger, substantially more profitable, and less levered compared with targets in non-stapled deals. Consistent with this, stapled financing tends to be associated with larger deal values, as seen in Figure 3 for most years in the sample. 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 the non-LBO public deals. This comparison is consistent with the literature, which generally finds LBO firms to be larger, older, more levered, and with lower earnings volatility compared with other public targets (Bargeron et al. (2008)).

However, a certification role for stapled financing presumes significant valuation uncertainty and asymmetric information regarding targets' assets. There is evidence in Panel A suggesting that stapled-finance firms are more affected by valuation uncertainty compared with non-stapled targets. Stapled targets are larger and more profitable than non-stapled targets, but yet have lower leverage. But leverage is endogenous. Myers (1977) argues that leverage would be negatively related to growth opportunities (as measured by higher intangible asset-intensity) and earnings volatility — characteristics associated with greater valuation uncertainty (Thomas (2002)). Consistent with this, the firm (or enterprise) value multiples (based on revenues or EBITDA) are significantly lower for stapled firms compared with the non-stapled targets. Moreover, stapled deals have significantly greater number of bidders (compared with non-stapled deals and public acquisitions). French and McCormick

[16] We use the same filters for other public deals as in the LBO sample. Namely, we include all M&A announcements relating to U.S. incorporated public targets between 1/1/2002-10/16/2011 that were subsequently closed or successful. Further, the acquirer controls less than 50% of the shares of the target at the announcement date and obtains 100% of the target shares; the transaction value is greater than $50 million (in 2002 dollars); and there are non-missing transaction and asset values and price data around the announcement. We exclude spinoffs, self-tenders, recapitalizations, privatizations, repurchases, and exchange offers.

(1984) predict that auctions would be preferred over negotiations when there is greater value uncertainty.

II. Information Asymmetry Measures

We now analyze the heterogeneity of our sample with respect to information asymmetry, using measures widely used in the literature.

Intangibles: Barth et al. (1998) argue that analysts' earnings forecasts are less reliable, ceteris paribus, for firms with more intangible assets. More generally, greater intangible asset intensity makes firms harder to evaluate and monitor by financial markets. We use the ratio of intangible-to-total assets (INTANGIBLES) for intangible asset intensity.

Earnings and Stock Return Volatility: Valuation risk and information asymmetry will be higher for firms with more volatile earnings history because this induces greater noise in the inference of the true distribution of returns. We use the within-firm standard deviation of earnings (EARNVOL). Similarly stock volatility is likely to be positively related to valuation risk and information asymmetry. As a robustness check on our analysis, we also use firm-specific stock return volatility (see Section IX).

Opacity Index: This is a microstructure measure of opacity (Bharath et al. (2009)) that is positively related to information asymmetry (OPACITY).

Discretionary Accruals: A poor mapping of accruals into cash flows reduces the information content of reported earnings. If investors differ in their ability to process earnings related information, then poor earnings quality can result in differentially informed investors and exacerbate the information asymmetry in financial markets (Diamond and Verrecchia (1991), Kim and Verrecchia (1994)). We use discretionary accruals (DISCACCRL) 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 (STCKTRNVR).

The analysis is presented in Panel B of Table 1. Stapled targets have significantly higher intangibles-to asset ratios, earning volatility, and opacity, and discretionary accruals when compared with non-stapled targets. However, stapled targets have significantly lower stock turnover. Thus, sellers receiving stapled financing exhibit greater information asymmetry (compared with non-stapled targets) based on all measures of information asymmetry. In sum, even though our sample is composed of LBOs there is nevertheless substantial sample heterogeneity with respect to information asymmetry measures. This heterogeneity presumably arises because the sample LBOs are drawn from a variety of industries that differ with respect to technological and economic uncertainty. Moreover, they represent firm-specific information histories — for example, because of different managerial approaches to accounting transparency.

III. Investment Bank Activity

Panel C of Table 1 shows the most active investment banks involved in our sample. Goldman Sachs Group leads the list with $81 billion of stapled LBO activity, followed by TPG Capital with $79 billion, and Kohlberg Kravis Roberts & Co (KKR) with $59 billion. The ranking in non-stapled deals roughly mimics the pattern in 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. Figure 4 shows the distribution of investment banks based on the number of deals, with Goldman Sachs, Credit Suisse, and Morgan Stanley being the most active in this regard.

Overall, the analysis in Table 1 is consistent with the hypothesis of a certification role for stapled financing. Specifically, the results suggest that the stapled targets suffer greater valuation uncertainty due to higher intangible asset-intensity and earnings volatility compared with non-stapled targets. This intrinsic valuation uncertainty appears compounded by agency costs from asymmetric information (Jensen and Meckling (1976), Leland and Pyle (1977)), as evidenced by the greater opacity, use of discretionary accruals, and stock turnover

of stapled targets.[17] The higher valuation uncertainty and agency costs of stapled targets are consistent with the relatively low leverage of stapled targets even though they tend to be larger and more profitable (Myers (1977)) than non-stapled targets. This analysis suggests that stapled financing can play a certification role by indicating higher debt capacity (or low intrinsic costs of debt) — this signal is especially valuable for buyers considering LBOs of targets.

IV. Price Improvement Effects of Stapled Financing

Expectations of sale price should be incorporated in the stock market announcement effects of the initiation of the sale, and in the evolution of abnormal returns during the sale process.

A. Abnormal Target Shareholder Returns

We calculate market-adjusted returns as the sum of the daily difference between raw returns and the CRSP value-weighted index (VW) or equally-weighed (EW) index returns over the relevant interval. We then compute raw as well as market-adjusted cumulative abnormal returns (CARs) and buy-and-hold (BHARs) over three different event windows: (i) between the announcement day ($t = 0$) and day +126 or the delisting date (whichever occurs first), (ii) between day -42 and day +126, and (iii) between day -1 and day +1, which results in the three-day raw (Raw3) or CARs (CAR3-VW and CAR3-EW).

I. Univariate Analysis

Table 2 compares the announcement returns of bids with and without the stapled financing. In the overall sample or unmatched comparison, the mean and median post-announcement (that is, the [0, +126] days) window the abnormal returns to target shareholders in stapled deals significantly exceed those for the non-stapled deals. In this window, the mean and median CAR-VW and BHAR-VW for sellers in stapled deals exceed those of

[17] In terms of the framework of Section II, panel B also suggests that there are two possible types of firm in our non-stapled sample. First, these may be firms that have low information asymmetry and, hence, do not benefit significantly from costly signaling. They may then be unwilling to offer higher advisory fees in exchange for the costly financing commitment from the banks. Second, these may be firms with high information asymmetry but low intrinsic values ($\theta \leq \theta^*$).

non-stapled targets by over 6% and the differences are highly statistically significant. And the mean and median differences using the EW portfolios measures are even greater. Similarly, the mean differences between the stapled and non-stapled CARs in the long (that is, [-42, +126] days) and short (that is, [-1, +1] days) windows are both statistically and economically significant.

We also present an analysis of announcement returns when stapled targets are matched with a non-stapled target using propensity score matching (or PSM, see e.g., Michaely and Roberts (2011)) based on industry and size. Specifically, for each sample firm $i = 1, ..., N$ and sample year t, instead of matching on a vector of characteristics X_{it}, we match on the propensity score $s(x_{it}) = \Pr\left(D_{it} = 1 \,|\, X_{it}\right)$. Here, D is a dummy variable that is equal to 1 for the "treatment" group (stapled LBOs) and 0 for a "comparison" group (non-stapled LBOs) and X is a vector of characteristics for firm i. We first run a logit regression that models the likelihood of a firm being a treated target in a particular year, utilizing a variety of control variables. We then use the predicted value from this regression model to generate propensity scores for all treatment and comparison group of targets. Next, both the treatment and comparison firms are randomly sorted. The closest comparison "match" for the first treatment firm is then identified by minimizing the absolute value of the difference between the logit of propensity scores. We replace the comparison firm once it is matched to a treatment firm. Matching with replacement minimizes the propensity score distance between the matched firms because each treated firm is matched to the closest comparison firm, even if the latter has been selected before. We tried various specifications of the characteristics vector X_{it}. However, matching on industry and size achieved the objective of a close match, as shown in Figure 5. Adding other variables did not materially change the matching results. Hence, for parsimony we report results for PSM on industry and size.

The matched comparisons (in columns 4 through 6) show statistically and economically significant positive announcement affects of stapled financing, complementing the unmatched comparison analysis. The mean CAR-VW for the stapled and non-stapled targets are de-

picted for the short ($[-1, +1]$ days) window in Figure 6.[18] In sum, 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 non-stapled deals. We next analyze the announcement effects of stapled financing using a multivariate analysis where we control for characteristics of deals, the sellers, and the financial market.

II. Multivariate Analysis

The specification of the multivariate model is:

$$\text{Abnormal Returns} = \alpha_0 + \alpha_1 Stapled + \mathbf{x}'\beta + u \tag{2}$$

Here, *Stapled* is an indicator variable identifying the presence of stapled financing, $\mathbf{x}$ is the vector of control variables, and u represents the error terms of the system. We incorporate several target-specific control factors in $\mathbf{x}$, including financial characteristics and anti-takeover provisions. We also control for offer characteristics, such as the method of deal financing, hostile tender offers, sponsor clubbing, and credit spreads. Table 3 specifies $\mathbf{x}$ and presents the results.

We run these regressions for both the post-announcement window ([0, +126] days) and the long window ($[-42, +126]$ days) with the VW CARs and BHARs. We also analyze the three-day VW CARs around the announcement day. In all cases, the presence of stapled financing has a significantly positive effect on abnormal returns, controlling for various characteristics of the seller, the deal, and the market. For example, in the post-announcement window, stapled financing ceteris paribus raises the CARs by 5.5%, which is similar to the corresponding magnitude in Table 2. The abnormal returns are ceteris paribus significantly lower for firms that have experienced relatively high recent stock returns, presumably because the cost of acquisitions is higher for such sellers (Officer et al. (2010), Bargeron et

[18] As a benchmark, Andrade et al. (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.

al. (2008)). There are significantly positive impact of tender offers, cash acquisitions, and takeover defenses on abnormal returns — consistent with other event studies in the literature (Jensen and Ruback (1983), Asquith and Mullins (1986)). The abnormal returns are also significantly and positively related to the number of bidders and tender bids, complementing the acquisitions literature (Servaes (1991), Officer et al. (2010)). In a related vein, target shareholders earn significant short term abnormal returns when the buyer is a strategic bidders, which complements the acquisitions literature (). But these gains do not survive in the longer event windows, possibly due to the small number of observations. However, club deals — where a consortium of bidders (typically private equity firms) — are associated with significantly lower abnormal returns that survive in the long event windows. In contrast, Boone and Mulherin (2011) find that the negative influence of club deals exists for short announcement windows but disappears in longer event windows. Investment bank reputation has a significantly positive effect on event abnormal returns, which is also consistent with the literature (Bowers and Miller (1990)), Kale et al. (2003)).[19]

Table 4 presents the estimates of interaction effects between stapled financing and information asymmetry measures (see Section III.B) in the regression eq. (2). For all event windows, stapled financing significantly improves the abnormal returns for firms that suffer from greater information asymmetry. For example, increasing the targets' intangible asset intensity by 1% would result in about 4.7% more VW CARs in the post-announcement window ([0, +126] days) for deals with stapled financing compared with non-stapled financed deals. The effects of other asymmetric information proxies are also statistically and economically significant in the predicted direction. Namely, the incremental effect of stapled financing on target shareholder wealth is significantly higher when these firms exhibit relatively high information asymmetry. These results support the support the hypothesis of a signaling or certification role for stape financing.

[19] We note that the effects of size and leverage are relatively weak and not significant for all measures and windows.

As noted before, there should be signaling effects from the loan terms offered in the stapled financing package. In particular, we expect that targets receiving relatively low debt cost (relatively short maturity loans) will ceteris paribus have higher (lower) event abnormal returns. To test this hypothesis, we extract the loan terms from the stapled finance offers from the proxy statements.[20] Untabulated results confirm the hypothesis, when we interact the presence of stapling with below median loan spreads and loan maturities. However, the statistical and economic significance of these 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 (VW CARs and BHARs) of targets with below median debt costs (in the stapled financing offer) are not significantly different from the abnormal returns of the other stapled targets. Thus, 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 largely from the former.[21]

V. Controlling for Endogeneity

In eq. (2), we implicitly assume that *Stapled* dummy is exogenous. However, the decision to provide stapled financing likely also depends on non-observable factors that are correlated with abnormal returns. Because of this omitted variables problem, the estimated effects of stapled financing may be inconsistent. To address this issue, 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

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

[21] The certification hypothesis also suggests weaker announcement effects for 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 (8 out of the 141 non-stapled deals).

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 $Stapled_i^*$ so that $Stapled_i = 1$ if $Stapled_i^* > 0$ and $Stapled_i = 0$, otherwise. The unobserved latent variable $Stapled_i^*$ is assumed to depend on a vector of variables Z_i that are correlated with the propensity to offer stapled financing:

$$Stapled_i^* = Z_i^{'}\gamma + u_i \tag{3}$$

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:

$$y_{ji} = x_i^{'}\beta_j + \varepsilon_{ji},\ j = 1, 2 \tag{4}$$

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

We model the endogeneity between the decision to offer — or to not offer — stapled financing and its pricing effects by allowing the residuals in the abnormal return eq. (4) to be correlated with the residuals in the stapled decision eq. (3). Thus, unobserved or missing variables in the decision equation also affect the abnormal returns. The specification of the error structure and details on the estimation methodology are presented in an online Appendix (see Appendix A.1). This model is a generalization of the classical Heckman (1979) two-stage procedure. Instead of two abnormal returns equations for the stapled and non-stapled groups (as in eq. (4)), under the Heckman model there would be one second-stage equation. But this would restrict the beta coefficients in eq. (4) to be the same across deal types, resulting in loss of information. In our case, however, observations on abnormal returns are not truncated but relate to different types of LBOs. Hence, the two-equation

model is more appropriate for our setting.

To infer the return improvement from stapled financing, we compute the difference between the actual abnormal returns 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 eq. (4). The resultant quantity is the *staple finance price improvement:*

$$\delta_i = \underbrace{y_{1i}}_{\text{actual}} - \underbrace{E\left[y_{2i} | Stapled_i^* > 0\right]}_{\text{hypothetical}} \tag{5}$$

We present the results of the two-stage switching regression tests in Table 5. Panel A of this table shows estimation results for the first-stage binary decision to offer (or to not offer) stapled financing (see eq. (3)). Intuitively, the likelihood of stapled financing should be positively related to the financing need for the deal, which in turn is positively related to the deal size and the difficulty of finding alternative financing, other things held fixed. Our empirical specification models the stapled financing decision based on ex ante firm- and market-related variables pertaining to deal size and financing need (proxied by size and leverage) and the presence of asymmetric information (proxied by earnings volatility). We proxy the difficulty (or ease) for buyers of finding alternative financing (capital availability) by the number of banks giving loans in the target firm's immediate area, aggregate stock illiquidity, the credit spread, and firm-specific agency costs (proxied by high earnings volatility). In addition, the stapled financing may offer may be influenced by institutional equity ownership of the seller and previous advisory relationship between the seller and the financial adviser. To our knowledge, this is one of the first estimated models of stapled financing offers.

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 when external capital is tight. Note that the coefficients for stock illiquidity, credit spreads, and earnings volatility are positive,

while the effect of recent stock market performance on the likelihood of stapled financing is significantly negative. Thus, 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 positively related to targets' informational asymmetry, which is consistent with the certification hypothesis and the foregoing results. Previous business relationship between the seller and the financial advisor makes stapled financing more likely. But higher institutional equity ownership reduces the likelihood of stapled financing deals. This is because institutional ownership is positively related to financial visibility (Mehran and Peristiani (2009)); hence, buyers of targets with high institutional ownership are more likely to attract financing to complete the deal.

Panel B (Table 5) presents the results for the second-stage outcome (see eq. (4)) for the stapled and non-stapled groups. We notice that the sell-side advisory reputation is significantly less important in stapled deals. This suggests 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, the negative effects of higher target leverage are significantly moderated for stapled deals. This indicates that stapled financing has significant valuation effects when there is uncertainty whether potential buyers can finance the acquisition. However, we do not observe significant differences between stapled- and non-stapled deals with respect to the characteristics of the deal or the bidding process.

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 (see eq. (5)). Thus, for each stapled deal we can address the question: What would have been the abnormal returns if banks had not offered the financing commitment? Table 6 presents the results from this analysis. On average, stapled deals would have shown significantly lower abnormal returns in the alternative scenario of no financing commitment from banks. For instance, the improvement in the VW CARs from stapled financing in the [0, +126] day

event window is 4.1%. Conversely, during the same event window, non-stapled deals on average would have received 4.6% higher CARs if they had received the commitment. These differences are both statistically and economically significant. We observe similar patterns in the [-42, +126] and [-1, +1] event windows.

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 and the 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. Panel A shows that the price improvement from stapled financing (see Table 5) is substantially higher for the high IA firms — 3.7% in the post-announcement window ([0, +126] days) — versus 1.8% in the same event window for low IA firms. Meanwhile, for the *non-stapled* deals, the hypothetical price improvement in the post-announcement window if they had obtained 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 for the non-stapled deals is significant only for the high IA deals.

Overall, the empirical results are above are consistent with hypothesis that staple financing acts as a 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. We now turn to this analysis.

VI. Stapled Financing and Debt Financing Costs

In an LBO, the target company's existing debt is usually refinanced 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. The certification effects of stapled financing on debt costs usually operate through

buyers' attempts to find alternative financing sources to "beat" the stapled offer.[22] Thus, we expect that the stapled financing buyouts should, ceteris paribus, obtain lower loan spreads, larger revolvers and have a greater proportion of financing through longer-term debt.

To study the effects of stapled financing on the debt financing of buyouts, we use LPC Dealscan, Capital IQ and SDC collectively to reconstruct all individual tranches of each deal. We also manually check proxy filings, including schedules 14A, TO-T, S-4 and 13E3, for information whenever these filings are available in Edgar. 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)).

Table 8 presents an univariate analysis of the effects of stapled financing on the capital structure of successful deals and their loan terms. Stapled deals have 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 allows greater use of debt — including higher default risk debt — in buyout financing. Furthermore, the loan costs for stapled deals are significantly lower than non-stapled deals. In particular, the loan spreads for the revolvers in stapled deals are about 18% lower compared with non-stapled deals and the cost differential for longer term loans (the term B loans) is of comparable magnitude. The loans in the stapled 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.

Table 9 displays a multivariate analysis of the effects of stapled financing on loan prices and maturities. We use as controls the significant determinants of loan pricing and maturities identified in the literature (Angbazo et al. (1998), Campbell and Taksler (2003), Bharath et al. (2011)). Consistent with this literature, ceteris paribus, loan costs (maturities) are

[22] This aspect of stapled financing appears to be well recognized in the industry. For example, the *Financial Times* (May 21, 2010) reported regarding the $3.4bn acquisition of Interactive Data Corp (NYSE: IDC) that "...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."

significantly and positively (negatively) related to leverage, earnings volatility, capital investment, and credit; but these quantities are negatively (positively) related to firm size, profitability, and recent stock returns. The results reinforce the univariate analysis of Table 8 and indicate that stapled financing has a significantly negative effect on loan costs of the buyers. Specifically, stapled financing reduces loan spreads for traditional bank loans, which include revolving lines of credit and Term A loans, by over 43 basis points (bps), and that of term B loans and senior loans by 35 bps and 19 bps, respectively. These effects are economically significant. For example, stapling lowers the costs of revolvers and term A loans by about 15% (based on their sample mean of 286 bps) and allows buyers to arrange loans of longer maturities (with an average difference of over 6 months).

In Table 10, we analyze the "counterfactual" question: What would be the estimated loan spreads for LBOs with stapled financing if they did *not* have such financing, and conversely? We find that the loan costs (maturities) for stapled deals would have been significantly higher (lower) — 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 40 bps higher (15% of the sample mean), while for the longer term loans the spreads would be higher by about 27 bps on average. Moreover, the term B loans would have longer maturities by about 9 months. On the other hand, if the non-stapled deals had obtained financing commitment from banks, then they could have reduced their bank loan spreads by 37 bps and their long term loan spreads by over 40 bps, while increasing the average maturity of these loans by 9 months.

We conclude from this analysis (Tables 8-10) that the certification effects of stapled financing are significant and ceteris paribus lower buyers' debt costs of deal financing and allow a more aggressive debt structure. Thus, the results in this section reinforce the previous findings regarding the significant price improvement effects of stapled financing. However, as we noted before, the credibility of the certification effects of stapled financing is based on banks' expected lending costs from the financial commitment. We now examine the relation

of stapled financing to the payoffs that accrue to investment banks from the deal process.

VII. Stapled Financing and Advisory Fees

In M&A, investment banks earn a variety of fees.[23] The success fee is usually the largest payoff for the banks and negotiated by the seller and the advisor prior to the sale process. This fee is typically computed based on a percentage of the final transaction price (the commission rate), although the fee structure can be complex. Thus, investment banks offering stapled financing, and thereby incurring the expected lending losses from the financing commitment (see Section II) can potentially increase 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 certification effects of the financing commitment. We obtain information regarding these fees from the proxy statements filed with the stapled financing documents and SDC.

Table 11 analyzes the relation of investment banks' success fees to stapled financing. We use as dependent variables both the commission rates and the logarithm of the actual fees paid. We control for a variety of factors that may plausibly influence the negotiated commission rates. From a theoretical perspective, we are especially interested in the relation of the commission rates to stapled financing. This is because the commission rates are negotiated ex ante 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.

Ceteris paribus, targets in stapled financed deals paid 1.2% higher commission rates for success fees compared with non-stapled deals; and this difference is significant at conventional levels. Moreover, target size and bank reputation are positively related to the commission rates. On the other hand, commission rates are lower when there are more financial advisors

[23] These typically include 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; "breakup" fees in case the seller and the advisor terminate their commercial relationship during the sale process; and reimbursement of expenses.

and if there is a previous business relationship with the advisor(s). Finally, commission rates are higher in stock market booms. In sum, our analysis confirms that investment banks offering stapled financing are able to raise their expected advisory fees by negotiating higher percentage of transactions values to be paid as success fees by the seller and by increasing the expected transaction value of the deal. These results are consistent with the requirement of the information equilibrium (Section II) that investment banks have incentives to provide a costly signal, namely, stapled financing. In this case, these incentives are provided through higher expected advisory fees.

Our results thus far are consistent with the hypotheses from the value certification framework of Section II. Stapled financing has a significant value certification effect, moderating the negative effects of asymmetric information on sale prices and lowering the debt financing costs of buyers. In particular, stapled financing appears to certify a higher debt capacity for relatively under-levered targets, which facilitates deal financing. Moreover, offering banks appear to benefit from providing the costly financing signals through increased advisory fees. However, light of potential conflicts of interest for the banks, we now examine the relation of stapled financing to the bidding process.

VIII. Stapled Financing and Bidding Competition

Bidding in the acquisitions process is often anonymous because both the seller and its investment bank(s) are bound by confidentiality contracts not to reveal the identities of competing bidders. Both theory and evidence in auction design suggests that the anonymous, confidential nature of bidding in the pre-public phase has pro-competitive features (Marshall and Marx (2009)). 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, banks offering stapled financing may manipulate the bidding process towards buyers who will likely accept the bank's financing offer, but who may not necessarily be the highest bidders. But if the banks have such conflicted interests, then we expect that bidding competition to be compromised.

We therefore compare the intensity of bidding competition and the price improvement in the bidding prices between stapled and non-stapled finance deals, using four measures of competition at various stages of the bidding process. These measures have been employed 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. We measure the excess of the final offer price relative to the initial bid price (CHNGBIDPRCE) 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 these measures. Table 12 shows that stapled financing is significantly and positively related to 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. Other things held fixed, the excess of the final offer price relative to the initial bid price in stapled financing deals was 5% higher compared with non-stapled financing deals.

However, 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 above, stapled financing tends to be offered to sellers with good fundamentals. Hence, there may be latent common factors that generate the positive association between stapled financing and bidding intensity observed in Table 12. To address this concern, we re-estimate 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). 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 re-

gression variables. This approach controls for the presence of common latent determinants of the bidding intensity and stapled financing; it is also robust to non-symmetric distributions. This model and the estimation procedure are specified in the online Appendix (Appendix A.2). The results, which are untabulated, reinforce those given in Table 12.

The analysis here complements the previous finding that investment banks earn higher commission rates from stapled financing targets. As Mehran and Stulz (2007) point out, market participants appear to consider financial intermediaries' conflicts of interest when making their decisions. In our context, 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.[24]

IX. Robustness Tests

We perform a variety of robustness tests on our analysis. In our analysis, we follow the recent literature (Brageron et al. (2008)) and measure the market values of equity of targets and buyers 63 days prior to the bid announcement. However, our results are robust to measuring the equity values 5 days prior to bid announcement. Next, we include the 7 strategic bidders in our analysis because they are immediately owned by LBO firms. However, the bidding motivation for these buyers may arguably differ from that of the financial bidders. Hence, we re-calculate the target CARs for stapled and non-stapled deals by excluding these 7 strategic bidders. The results are materially unaffected. We also analyze the CARs for the largest 50% of public (non-LBO) deals.[25] We find that stapled deals have significantly higher VW CARs relative to the public deals in the post-announcement ([0, +126] days) and short ([-1, 1] days) windows. However, there is no significant difference between the VW CARs of non-stapled and public deals. Similarly, the positive effects of stapled financing on the VW CARs in the multivariate analysis (Table 3) are robust to the inclusion of the

[24] Of course, these findings do not *prove* that generating lending business is not a motivation for investment banks in offering stapled financing. We show, 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.

[25] Here we exclude the 1 stapled deal in this public acquistions sample.

largest 50% (non-LBO) public deals. Finally, we replace the earnings volatility measure of asymmetric information (see Table 5) with targets' stock return volatility measured as the standard deviation of returns over the previous 12 months. The effects of stapling on VW CARs for high stock return volatility targets is stronger than shown in Table 5.

X. Conclusion

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, where the seller pre-arranges a financing commitment from its financial advisors, can provide value certification of target firms. Of course, stapled financing can also generate lending business for firms. However, there are potential conflicts of interest if banks steer the deal towards buyers that will exercise the financing option rather than offer higher bids. These issues 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, and controlling for endogeneity effects, we find evidence consistent with a significant value certification role for stapled financing. In particular, our analysis supports the predictions from a signaling or information equilibrium. Stapled financing is provided to sellers that have higher benefits ex ante from certification because they exhibit greater information asymmetry and have larger financing needs. Further,, stapled financing significantly increases targets' shareholder wealth in the acquisitions process, especially for firms subject to higher adverse selection discount. Complementing these results, stapled financing has significant positive certification effects with respect to higher debt capacity and lower costs of debt. And while stapled financing can also facilitate the generation of lending business for banks, our analysis does not indicate that conflicts of interest compromise the bidding process for stapled targets. Rather, we find that stapled financing is positively related to price improvement and competition intensity in the bidding process.

The credibility of certification by stapled financing is based on the ex ante financing

commitment by banks, which is costly (for them) because ex post financing can not be made contingent on buyers' characteristics. However, we find that banks offering stapled financing are on average receive higher expected advisory fees — from negotiating higher success fees rates and from target price improvement due to certification. In sum, certification through stapled financing appears incentive compatible for both the investment banks and the sellers. Nevertheless, our analysis suggests that investment banks offering stapled financing trade off lower lending efficiency against higher expected fees.

Our analysis indicates that stapled financing played a significant certification role during 2002-2011 — the period where it played an important role in LBOs. However, there has not been significant use of stapled financing more recently. One possible reason for this decline is that the economic environment for M&A has shifted recently (after 2012), reducing the incentives for the choice of costly certification by stapled financing. As we explicate above, stapled financing imposes dissipative costs on both the banks — through expected lending losses — and the targets — through higher advisory fees. But when certification can occur through multiple signals, as is the case in M&A, then the theory of efficient signaling (e.g., Milgrom and Roberts (1986), Ambrish et al. (1987)) suggests that signals will be chosen to economize on dissipative costs (for given levels of information effects). Stapled financing was used intensively during the leveraged buyout (LBO) boom in 2004-2007, and during 2009-2011 when following the financial crisis outside funding dried up for many of the major deals. In particular, our results suggest that stapled financing appears especially effective in LBOs because it certifies higher debt capacity, or low intrinsic costs of debt. Thus, the relative decline in LBO activity — compared with its boom years in the previous decade — along with increased credit and private equity market financing for M&A — compared to the immediate aftermath of the financial crisis — appear responsible for the lower recent utilization of stapled financing.

References

Allen, F., 1990, The market for information and the origin of financial intermediation, Journal of Financial Intermediation 1, 3-30.

Allen, L., and S. Peristiani, 2007. Loan underpricing and the provision of merger advisory services, Journal of Banking and Finance 31, 3539-3562.

Ambarish, R., K. John, and J. Williams, 1987. Efficient signalling with dividends and investments, Journal of Finance 42, 321-343.

Andrade, G., M. Mitchell, and E. Stafford, 2001. New evidence and perspective on mergers, Journal of Economic Perspectives 15, 103-120.

Angbazo, L., J. Mei, and A. Saunders, 1998. Credit spreads in the market for highly leveraged transaction loans, Journal of Banking and Finance 22, 1249-1282.

Asquith, P., and D. Mullins, 1986. Equity issues and offering dilution, Journal of Financial Economics 15, 61-89.

Bargeron, L., F. Schlingemann, R. Stulz, and C. Zutter, 2008. Why do private acquirers pay so little compared to public acquirers? Journal of Financial Economics 89, 375-390.

Barth, M., R. Kasznik, and M. McNichols, 1998. Analyst coverage and intangible assets, Working Paper, Stanford University.

Beatty, R., and J. Ritter, Investment banking, reputation and underpricing of initial public offerings, Journal of Financial Economics 15, 213-232.

Bharath, S., S. Dahiya, A. Saunders, and A. Srinivasan, 2011. Lending relationships and loan contract terms, Review of Financial Studies 24, 1141-1203

Bharath, S., P. Pasquariello, and G. Wu, 2009. Does asymmetric information drive capital structure decisions?. Review of Financial Studies 22, 3211-3243.

Bhattacharya, S. 1979. Imperfect information, dividend policy, and "the bird in the hand" fallacy, Bell Journal of Economics 10, 259-270.

Boone, A.L., and J. Mulherin, 2008, Do private equity consortiums impede takeover competition? Working paper, Kansas State University and University of Georgia.

Boone, A.L., and J. Mulherin, 2011. Do private equity consortiums facilitate collusion in takeover bidding?, Journal of Corporate Finance 17, 1475–1495.

Bowers, H., and R. Miller, 1990. Choice of investment banker and shareholders wealth of firms involved in acquisitions. Financial Management 19, 34-44.

Campbell, J., and G. Taksler, 2003. Equity volatility and corporate bond yields, Journal of Finance 58, 2321-2349.

Carter, R., and S. Manaster, 1990, Initial public offerings and underwriter reputation, Journal of Finance 45, 1045-1067.

Chon, G., and A. Das, 2011, A ruling to chill Wall Street, Wall Street Journal, February 18, page C1.

Coase, R., 1937, The nature of the firms, Economica 4, 386-405.

Dagenais, M., and D. Dagenais,1997. Higher moment estimators for linear regression models with errors in the variables, Journal of Econometrics 76, 193–222.

DeAngelo, H., L. DeAngelo, and E. Rice,1984. Going private: minority freezeouts and stockholder wealth. Journal of Law and Economics 27, 367-401.

Dechow, P., and I. D. Dichev, 2002. The quality of accruals and earnings: The role of accrual estimation errors. The Accounting Review 77 (Supplement): 35-59.

Diamond, D., 1984. Financial intermediation and delegated monitoring, Review of Economic Studies 51, 393-414.

Diamond, D., and R. Verrecchia, 1991. Disclosure, liquidity, and the cost of capital. Journal of Finance 46, 1325-1359.

Drucker, S., and M. Puri, 2005. On the benefits of concurrent lending and underwriting, Journal of Finance 60, 2763-2799.

Erickson, T., and T. Whited, 2000. Measurement error and the relationship between investment and q, Journal of Political Economy 108, 1027–1057.

Erickson, T., and T. Whited, 2002. Two-step GMM estimation of the errors-in-variables model using higher-order moments, Econometric Theory 18, 776–799.

Greene, W., 2003. Econometric analysis, New York: Pearson.

Guner, A. 2006. Loan sales and the cost of borrowing, Review of Financial Studies 19, 687–716.

Guo, S., E. Hotchkiss, and W. Song, 2009. Do buyouts (still) create value? Journal of Finance 64, 479-517.

Heckman, J., 1979. Sample selection bias as a specification error. Econometrica 47, 153-161.

James, C., 1992, Relationship-specific assets and the pricing of underwritten services, Journal of Finance 47, 1865-1886.

Jensen, M., and R. Ruback 1983. The market for corporate control, Journal of Financial Economics 11, 5-50.

Kale, J. R., O. Kini, and H. Ryan, 2003. Financial advisors and shareholder wealth gains in corporate takeovers. Journal of Financial and Quantitative Analysis 38, 475 – 501.

Kaplan, S., and J. Stein. 1993. The evolution of buyout pricing and financial structure in the 1980s. Quarterly Journal of Economics 108, 313-57.

Karpoff, J. , 1987, The relation between price changes and trading volume: A survey. Journal of Financial and Quantitative Analysis 22, 109-126.

Kim, O, and R. Verrecchia, 1994. Market liquidity and volume around earnings announcements. Journal of Accounting & Economics 17, 41-67.

Leland, H., and D. Pyle, 1977, Informational asymmetries, financial structure and financial intermediation, Journal of Finance 32, 371-387.

Lewbel, A, 1997. Constructing instruments for regressions with measurement error when no additional data are available, with an application to patents and R&D. Econometrica 65, 1201–1213.

Lo, A., and J. Wang, 2000, Trading volume: definitions, data analysis, and implications of portfolio theory. Review of Financial Studies 13, 257-300.

Logue, D., 1973, On the pricing of unseasoned equity issues: 1965-1969, Journal of Financial and Quantitative Analysis 8, 91-103.

Maddala, G. S., 1983, Limited dependent and qualitative variables in econometrics. Cambridge University Press, New York.

Marshall, R.C., and Marx, L., 2009. The vulnerability of auctions to bidder collusion. Quarterly Journal of Economics 124, 883-910.

Mehran, H., and R. Stulz, 2007, The economics of conflicts of interest in financial institutd

Nanda, V., and Y. Yun, 1997, Reputation and financial intermediation: An empirical investigation of the impact of IPO mispricing on underwriter market value. Journal of Financial Intermediation 6, 39-63.

Officer, M., O. Ozbas, and B. Sensoy, 2010. Club deals in leveraged buyouts. Journal of Financial Economics 98, 214–240.

Povel, P., and R. Singh, 2010. Stapled finance, Journal of Finance 65, 927-953.

Puri, M., 1996, Commercial banks in investment banking: Conflict of interest or certification role?, Journal of Financial Economics 40, 373-401.

Riley, J., 1979, Informational equilibrium, Econometrica 47, 331-359.

Roberts, M., and A. Sufi, 2009. Financial contracting: A survey of research and future directions, Annual Review of Financial Economics 1, 207–226.

Servaes, H, 1991. Tobins Q and the gains from takeovers, Journal of Finance 46: 409-419.

Spence, A. M., 1973, Job market signalling, Quarterly Journal of Economics, 90, 225-243.

Servaes, H., and M. Zenner, 1996. The role of investment banks in acquisitions, The Review of Financial Studies 9, 787-815.

Thomas, S., 2002, Firm diversification and asymmetric information: evidence from analysts' forecasts and earnings announcements, Journal of Financial Economics 64, 373-396.

Tinic, S.M., 1988, Anatomy of initial public offerings of common stock, Journal of Finance 43, 789-822.

Williamson, O., 1975. Markets and hierarchies: Analysis and antitrust implications, New York, NY: Free Press.

Table 1. Summary Statistics for Stapled and Non-stapled LBO 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. (2009). 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 LBOs	(2) Non-Stapled LBOs	(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	0.232	0.00***	0.00***
Target Size($mm)	2,746	2,022	1,569	0.00***	0.00***
Average Deal Value($mm)	5,260	3,455	2,187	0.01***	0.01***
Total Deal Value($mm)	205,057	469,279	3,939,490	0.00***	0.00***
Average TEV/Revenue	2.11	2.93	2.99	0.04**	0.00**
Average TEV/EBITDA	10.73	12.10	9.87	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	1,763		
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 logarithm of total sales. Matching is done by replacement and our sample includes all stapled and non-stapled LBO deals. (*), (**) 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 LBO Financing on Shareholders' Gains: Multivariate Regression Results

This table presents coefficient estimates from regressions relating target returns to an array of covariates for the full sample that includes all stapled and non-stapled LBO deals. *Stapled* is an indicator as for stapled LBO deals. BHAR-VW, CAR-VW 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. *Number of Bidders* is the number of potential bidders agreeing to sign the confidentiality/standstill agreements. *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; *Strategic Bidder* is a dummy variable that takes a value of 1 when there are strategic 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.

	(1) [-42, +126] BHAR-VW		(2) [-42, +126] CAR-VW		(3) [0, +126] BHAR-VW		(4) [0, +126] CAR-VW		(5) CAR3-VW	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Stapled	0.060***	(2.77)	0.055**	(2.12)	0.066***	(2.77)	0.055**	(2.39)	0.040***	(4.76)
Relative Size	-0.025	(-1.29)	-0.016	(-1.42)	-0.050	(-1.45)	-0.035*	(-1.97)	-0.049*	(-1.70)
Leverage	-0.068*	(-1.88)	0.054	(1.60)	-0.095	(-1.46)	-0.088	(-1.36)	-0.097	(-1.31)
Past Stock Return	-0.050**	(-2.37)	-0.040**	(-2.34)	-0.030**	(-2.17)	-0.034**	(-2.23)	-0.052**	(-2.44)
Reputation	0.014**	(2.10)	0.009**	(2.20)	0.017***	(2.52)	0.010**	(2.16)	0.020**	(2.10)
Number of Bidders	0.010***	(2.76)	0.010**	(2.18)	0.011**	(2.14)	0.014**	(2.15)	0.009*	(1.97)
Tender	0.013**	(2.41)	0.014***	(2.71)	0.019***	(2.55)	0.016**	(2.27)	0.015***	(2.96)
Hostile	-0.007	(-1.66)	-0.008	(-1.50)	-0.012*	(-1.91)	-0.007*	(-1.69)	-0.030	(-1.49)
Club Bidding	-0.046***	(-2.56)	-0.045***	(-2.52)	-0.049**	(-2.00)	-0.050***	(-2.66)	-0.044***	(-2.77)
Cash	0.010**	(2.10)	0.004*	(1.85)	0.004*	(1.99)	0.003*	(1.85)	0.006*	(1.82)
Strategic Bidder	0.005	(1.54)	0.008	(1.59)	0.009	(1.64)	0.007	(1.52)	0.010*	(1.72)
Takeover Defense	0.006*	(1.80)	0.008*	(1.83)	0.010*	(1.97)	0.014**	(2.11)	0.011*	(1.95)
# of deals	186		186		186		186		186	
Adj. R-squared	0.086		0.075		0.082		0.082		0.079	

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

This table replicates Table 3 and reports only coefficient estimates from regressions relating target returns to measures of asymmetric information interacted with the "Stapled" indicator. Sample includes all stapled and non-stapled LBOs. BHAR BHAR-VW, CAR-VW 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. Our sample includes all stapled and non-stapled LBO deals. (*), (**) 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-VW	0.055***	0.062**	0.027**	-0.025**	0.034**
	(2.52)	(2.48)	(2.19)	(-2.14)	(2.29)
[0, +126] CAR-VW	0.037**	0.047**	0.040**	-0.032**	0.028**
	(2.28)	(2.20)	(2.35)	(-2.28)	(2.18)
[-42, +126] BHAR-VW	0.041**	0.061***	0.039**	-0.047***	0.026**
	(2.37)	(2.56)	(2.30)	(-2.65)	(2.15)
[-42, +126] CAR-VW	0.034**	0.050**	0.042**	-0.060***	0.014*
	(2.28)	(2.14)	(2.48)	(-2.81)	(1.90)
CAR3-VW	0.022**	0.029*	0.025**	-0.031**	0.038**
	(2.06)	(1.85)	(2.06)	(-2.27)	(2.26)

Table 5. The Effects of Stapled LBO 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. *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*. Our sample includes all stapled and non-stapled LBO deals. *, ** and *** indicate significance at the 10%, 5% and 1% levels.

Panel A: First Stage Results of Endogenous Switching Model

	Marginal Effect	Pr>ChiSq
LnSize	0.039**	(0.04)
Illiquidity	0.024**	(0.02)
Leverage	0.017*	(0.06)
InstOwner	-0.810**	(0.02)
Capital Availability	-0.096***	(0.00)
Volatility	0.321**	(0.04)
Previous Relationships	0.026*	(0.06)
Credit Spread	0.008*	(0.08)
# of deals	186	
σ	-0.049	(0.29)
ρ	12.26	(0.00)
Pseudo R-squared	0.058	
Model *p*-value (Likelihood Ratio Test)	0.034	

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

Panel B: Second Stage Results of Endogenous Switching Model

	Stapled LBOs Abnormal Return Equation						Non-stapled LBOs Abnormal Return Equation					
	(1) [-42, +126] CAR		(2) [0, +126] CAR		(3) CAR3		(4) [-42, +126] CAR		(5) [0, +126] CAR		(6) CAR3	
	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat	Estimate	t-stat
Relative Size	-0.066*	(-1.69)	-0.033**	(-2.40)	-0.030**	(-2.15)	-0.033	(-1.63)	-0.018*	(-1.75)	-0.019	(-1.58)
Leverage	-0.025	(-1.57)	-0.029	(-1.61)	-0.045*	(-1.89)	-0.084**	(-2.15)	-0.079**	(-2.04)	-0.098*	(-2.29)
Past Stock Return	-0.124**	(-2.36)	-0.118**	(-2.04)	-0.110**	(-2.14)	-0.072**	(-2.11)	-0.030**	(-2.42)	-0.021*	(-1.92)
Reputation	0.014	(1.13)	0.022	(1.29)	0.015	(1.21)	0.037***	(2.81)	0.044***	(2.51)	0.064***	(2.88)
Number of Bidders	0.027***	(2.68)	0.022**	(2.11)	0.010**	(2.58)	0.011*	(1.94)	0.017**	(2.00)	0.016**	(2.05)
Tender	0.139**	(2.15)	0.137**	(2.09)	0.093*	(1.66)	0.084**	(2.16)	0.120**	(2.44)	0.079**	(2.10)
Hostile	-0.015	(-1.62)	-0.019	(-1.40)	-0.021*	(-1.70)	-0.022	(-1.05)	-0.018	(-1.39)	-0.020	(-1.02)
Club	-0.042**	(-2.20)	-0.039**	(-2.11)	-0.027*	(-1.87)	-0.026**	(-2.05)	-0.021**	(-2.04)	-0.018*	(-1.71)
Cash	0.008	(1.50)	0.001*	(1.68)	0.006	(1.56)	0.008*	(1.88)	0.006*	(1.80)	0.009	(1.33)
Strategic Bidders	0.009	(1.57)	0.005	(1.50)	0.010*	(1.66)	0.008	(1.55)	0.008	(1.54)	0.011*	(1.69)
Takeover Defense	0.024**	(2.17)	0.029***	(2.57)	0.024**	(2.26)	0.037**	(2.27)	0.022**	(2.16)	0.016**	(2.09)

Table 6. Pricing Improvement from Stapled LBO Financing

This table presents actual mean value-weighted CARs and hypothetical mean value-weighted CARs for stapled and unstapled deals for the years 2002-2011. VW CAR and CAR3-VW are described in Table 2 (we drop the VW designation for notational ease). 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	0.252	0.041**
[0 +126] CAR	0.231	0.205	0.026*
CAR3-VW	0.213	0.189	0.024*
Panel B: Comparisons for Non-stapled LBOs			
[-42, +126] CAR	0.144	0.190	-0.046***
[0 +126] CAR	0.240	0.274	-0.034**
CAR3	0.148	0.172	-0.024*

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

This table presents actual mean value-weighted CARs and hypothetical mean value-weighted CARs for stapled and unstapled deals 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. VW CAR and CAR3-VW are described in Table 2 (we drop the VW designation for notational ease). The computation of these imputed values is discussed in the text. All variables are measured in percentages. Our sample includes all stapled and non-stapled LBOs. *, ** 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	0.265	0.180	0.037**	0.018*
[0 +126] CAR	0.242	0.186	0.207	0.169	0.035**	0.017*
CAR3	0.222	0.165	0.202	0.152	0.020*	0.013
Panel B: Comparisons for Non-stapled LBOs						
[-42, +126] CAR	0.258	0.120	0.213	0.134	-0.045***	-0.014
[0 +126] CAR	0.282	0.229	0.304	0.247	-0.022*	-0.018*
CAR3	0.153	0.124	0.166	0.132	-0.013	-0.008

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 deals 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. *Syndicate* is the number of lenders in the syndicate. Our sample includes all stapled and non-stapled LBO deals. (*), (**) 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	-43.62***	(-2.99)	-35.18**	(-2.19)	-19.23***	(-2.80)	6.114**	(2.37)
LnSize	-34.16***	(-2.90)	-12.20***	(-2.58)	-24.60**	(-2.49)	8.054***	(2.92)
Leverage	14.29***	(3.29)	15.21**	(2.85)	24.50***	(2.97)	-3.216*	(-1.74)
Past Stock Return	-28.60***	(-3.45)	-31.28***	(-2.53)	-8.292**	(-2.11)	0.958	(1.04)
Intangibles	15.27**	(1.80)	16.22***	(2.70)	29.66***	(5.92)	9.610**	(2.40)
Volatility	4.635	(1.64)	3.010*	(1.68)	-33.12*	(-1.98)	-2.495*	(-1.90)
Lending Relationships	-89.27***	(-2.32)	-46.33***	(-2.77)	-11.25**	(-2.20)	8.958**	(2.38)
Secured	6.880*	(1.74)	-4.667*	(-1.58)	-9.494**	(-2.14)	-4.008	(-0.66)
Credit Spread	5.728**	(2.27)	5.726**	(2.15)	9.165*	(1.97)	-0.803***	(-2.61)
# of deals	178		165		109		178	
Adj. R-squared	0.307		0.382		0.310		0.280	

Table 10. Counterfactual Analysis for Loan Terms

The table presents actual mean loan terms, hypothetical mean loan terms for stapled and unstapleddeals, 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	314.7	-39.6***
Term B Loan Spread	277.9	305	-27.1**
Senior Spread	289.3	318.39	-29.0**
Maturity	71.8	63.2	8.6**
Panel B: Comparisons for Non-stapled LBOs			
Bank Loan Spread	325.5	288.1	37.4***
Term B Loan Spread	339.4	299.2	40.2***
Senior Spread	328.3	304.3	24.0**
Maturity	60.1	69.1	-9.0**

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. Our sample includes all stapled and non-stapled LBO deals. (*), (**) 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)
# of deals	172		172	
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. *Strategic Buyer* is a dummy variable that takes a value of 1 when there are strategic buyers in the pool. Our sample includes all stapled and non-stapled LBO deals. (*), (**) 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	2.190	(1.58)	1.176	(1.33)	1.888	(1.30)	0.642*	(1.90)	0.050**	(2.30)	2.989**	(2.05)
Illiquidity	-0.823*	(-1.80)	-0.162*	(-1.85)	0.191	(1.28)	0.116	(1.33)	0.019	(1.47)	1.172	(1.24)
MarketBook	0.606***	(2.69)	0.277**	(2.22)	0.115	(1.65)	0.122*	(1.72)	0.241**	(2.10)	0.466**	(2.49)
InstOwner	0.748**	(2.10)	1.008**	(2.47)	0.529***	(2.77)	0.733***	(2.51)	0.404**	(2.18)	0.038**	(2.25)
Takeover Defense	0.130*	(1.89)	0.065	(1.09)	0.106	(1.60)	0.138**	(2.15)	0.058	(1.49)	0.144*	(1.95)
Strategic Buyer	-0.456**	(-2.39)	-0.267*	(-1.88)	-0.019	(-1.19)	-0.005	(-1.05)	-0.305**	(-2.16)	-0.188*	(-1.74)
# of deals	186		186		186		186		186		186	
Adj. R-squared	0.109		0.100		0.112		0.115		0.107		0.127	

Figure 1: A Typical Stapled Financing Deal

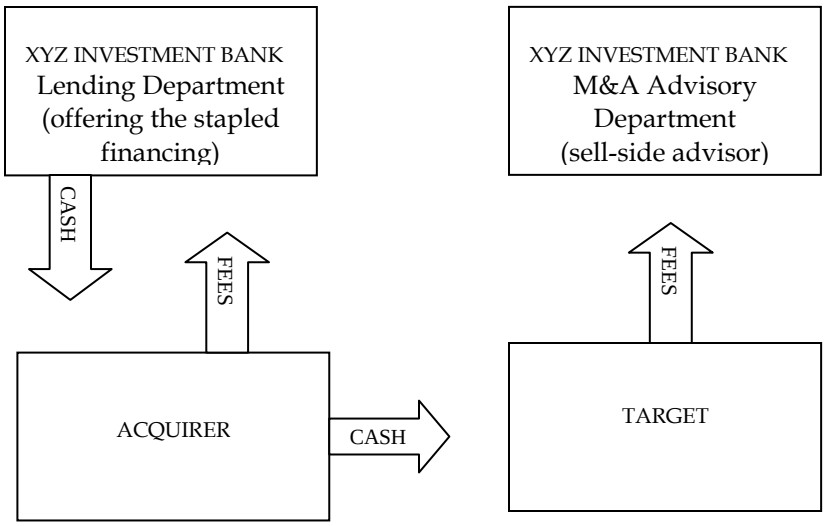


Figure 2: Sample Distribution of Stapled and Non-stapled LBOS by Year

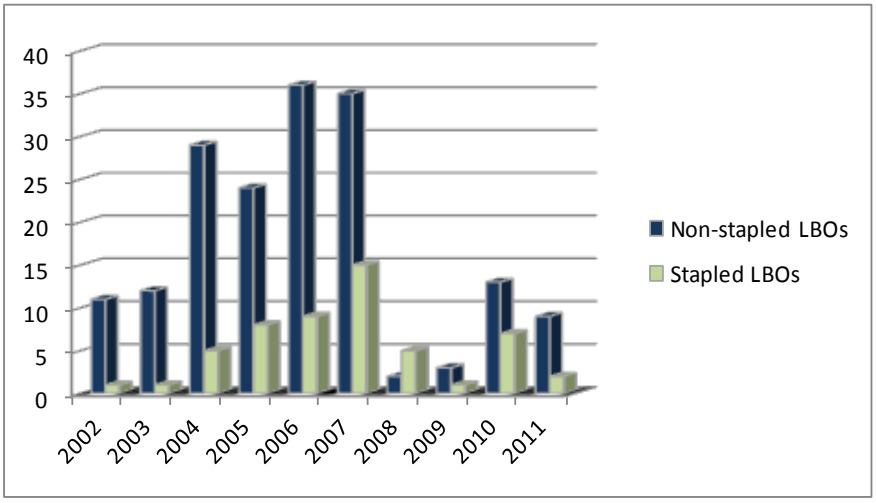


Figure 3 Average Stapled and Non-stapled LBO Size by Year

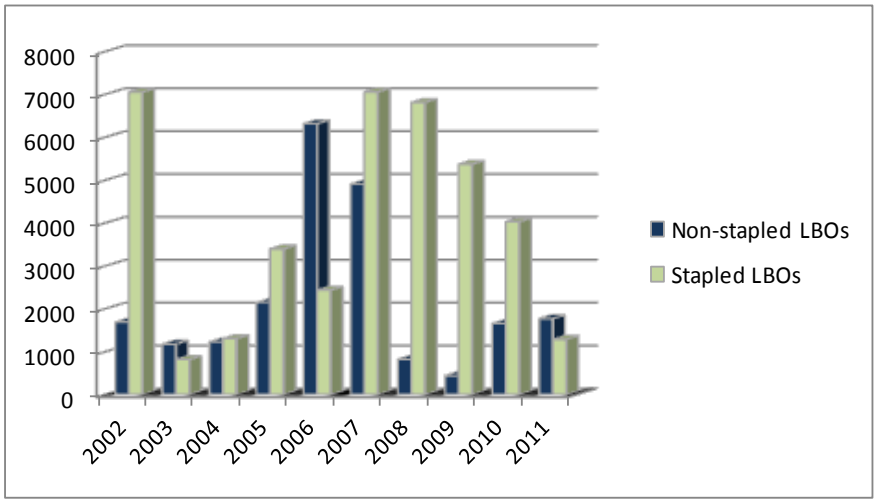


Figure 4 Distribution of Financial Advisors that Offered Stapled-financing

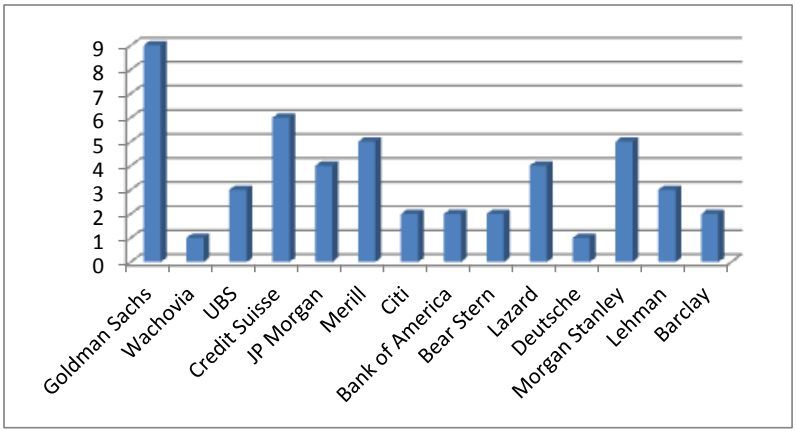


Figure 5 Propensity Scores for stapled-target (treated), non-stapled controls (matched non-treated)

This figure provides an illustration of the propensity score matching (based on industry and size) approach. The two densities plotted in the figure depict the predicted probability, i.e. propensity score, of being offered a stapled package for our stapled LBO (blue), and non-stapled LBO (red) targets.

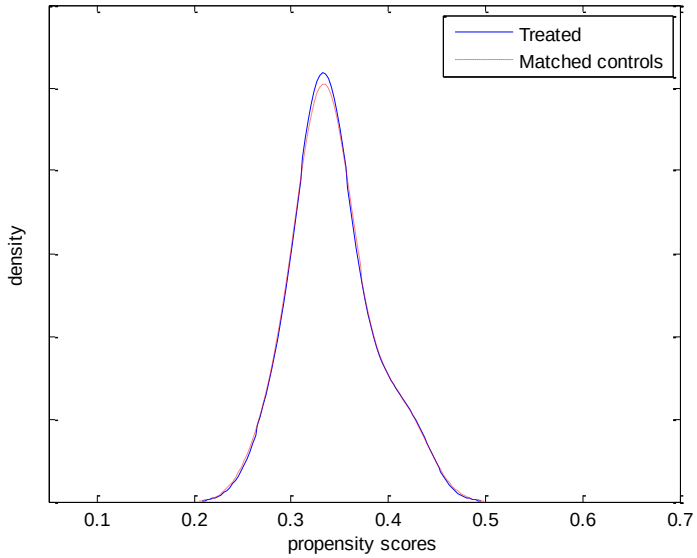
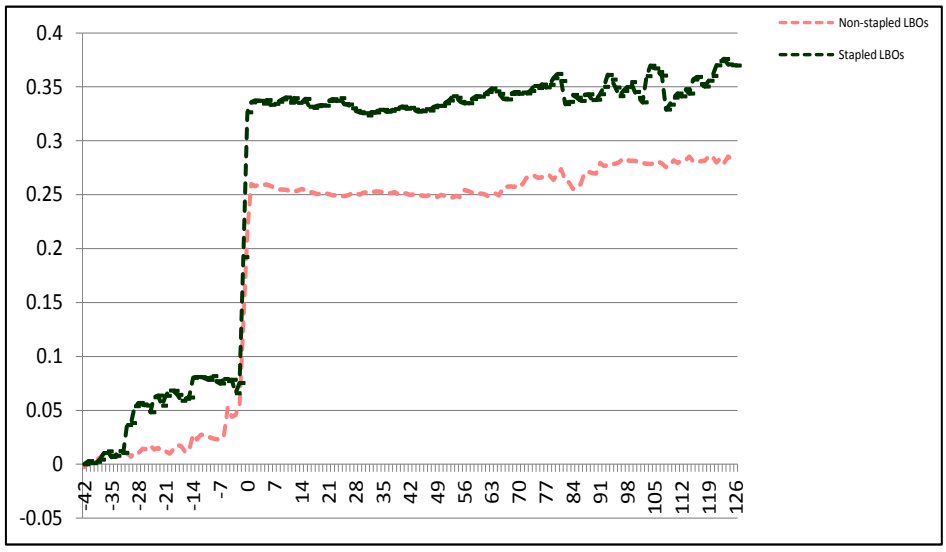


Figure 6 Cumulative Abnormal Returns around the Event Day for Stapled and Non-stapled LBOs



Appendix A.1

Estimation Details of the Switching Regression Model

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 $Stapled_i^*$ so that:

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

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, industry, and time effects.

$$Stapled_i^* = Z_i^{'}\gamma + u_i \tag{2}$$

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:

$$y_{ji} = x_i^{'}\beta_1 + \varepsilon_{ji},\ j = 1, 2 \tag{3}$$

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 (3) to correlate with the residual in the stapled decision equation (2) 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

$$\Sigma \equiv cov(\varepsilon_{1i}, \varepsilon_{2i}, u_i) = \begin{pmatrix} \sigma_u^2 & \sigma_{u1} & \sigma_{u2} \\ \sigma_{1u} & \sigma_1^2 & \sigma_{12} \\ \sigma_{2u} & \sigma_{21} & \sigma_2^2 \end{pmatrix} \tag{4}$$

Estimation and Inference

Estimation strategies involve sequential estimation procedures or maximum likelihood. The sequential procedure involves first estimating (2) by a probit regression, yielding consistent estimates of γ. With this in hand, then the abnormal return regressions (3) 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 (3). The resultant quantity is what we will call the "staple finance price improvement" and is given by:

$$\delta_i = \underbrace{y_{1i}}_{\text{actual}} - \underbrace{E\left[y_{2i} | Stapled_i^* > 0\right]}_{\text{hypothetical}} \tag{5}$$

Econometrically, the hypothetical abnormal return in the second term in (5) is the predicted value from evaluating stapled deal- and firm-specific attributes in the outcome equation for

non-stapled LBOs:

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

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

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

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

Appendix A.2

Details of GMM Estimation

Our basic empirical specification for the joint determination of the use of staple financing and the bidding intensity is:

$$\gamma_i = \kappa_i A + z_i^{\gamma} B + \Gamma_i + \varepsilon_i \tag{6}$$

$$\kappa_i = z_i^{\kappa} C + \Gamma_i + \nu_i \tag{7}$$

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

[1] 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 $atanh\ \rho_i = 1/2\ln\left(\frac{1+\rho_i}{1-\rho_i}\right)$.

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. For notational ease, we rewrite the system (6)–(7) as:

$$\gamma_i = \kappa_i A + z_i B^{\dagger} + \Gamma_i + \varepsilon_i \tag{8}$$

$$\kappa_i = z_i C^{\dagger} + \Gamma_i + \nu_i \tag{9}$$

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 (8) is given by:

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

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 (9), 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 (9) gives:

$$\kappa_i - z_i \mu_\kappa = \Gamma_i + z_i \left(C^{\dagger} - \mu_\kappa\right) + \nu_i = \Gamma_i^* + \nu_i \tag{11}$$

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 (10) $\mu_\gamma = E\left(z_i' z_i\right)^{-1} E\left(z_i' \gamma_i\right) = A^* \mu_\Gamma + B^*$. Subtracting $z_i \mu_\gamma$ from both sides of (10) yields:

$$\gamma_i - z_i \mu_\gamma = A^* \Gamma_i + z_i \left(B^* - \mu_\gamma\right) + \varepsilon_i^* = A^* \Gamma_i^* + \varepsilon_i^* \tag{12}$$

Note that for the reduced-form model in (11) and (12) 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:

$$\hat{\mu}_\gamma - (1 + \hat{A}_{GMM})\left(\hat{\mu}_\kappa - C^\dagger\right) - B^* = 0 \tag{13}$$

We next use Equations (11) and (12) along with $E(\Gamma^*_i) = E(\varepsilon^*_i) = E(\nu_i) = 0$. Taking expectations of (11) and (12) 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:

$$Ez_i\left(\hat{A}_{GMM} + 1\right)\left[\left(C^\dagger - \hat{\mu}_\kappa\right) - \left(B^* - \hat{\mu}_\gamma\right)\right] = 0 \tag{14}$$

We substitute for $B^* = B^\dagger + \hat{A}_{GMM}C^\dagger$, $\hat{\mu}_\kappa = \left[\sum_i z_i'z_i\right]^{-1}\left[\sum_i z_i'\gamma_i\right]$, $\hat{\mu}_\gamma = \left[\sum_i z_i'z_i\right]^{-1}\left[\sum_i z_i'\kappa_i\right]$ 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, (13) and (14), 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 $\mathbb{E}\left[f_i\left(\mu\right)\right] = c\left(\Psi\right)$, where $\mu \equiv vec\left(\mu_\gamma, \mu_\kappa\right)$, $f_i\left(\mu\right)$ 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 $c\left(\Psi\right)$ are the corresponding right-hand sides of (a.1)–(a.8). The sample analog of $f_i\left(\mu\right)$ can be written as $g_i\left(\hat{\mu}\right) = n^{-1}\sum_{i=1}^n f_i\left(\hat{\mu}\right)$. 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)).

References

Arellano, M., and S. Bond. 1991. Some Tests of Specification for Panel Data: Monte Carlo Evidence and an Application to Employment Equations. Review of Economic Studies 58, 277–297.

Erickson, T., and T. Whited, 2002. Two-step GMM estimation of the errors-in-variables model using higher-order moments, Econometric Theory 18, 776–799.

Greene, W., 2003. Econometric analysis, New York: Pearson.

Holtz-Eakin, D., W. Newey, and H. Rosen. 1988. Estimating Vector Autoregressions with Panel Data. Econometrica 56:1371–1396.