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Evidence from the Sale of Minority Equity Stakes

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Abstract: Most of the existing empirical studies estimate the impact of fire sales either without the benefit of market prices from frequent trades, as with aircraft sales, or without observing the prices received by distressed sellers, as with the sales of equity securities by mutual funds facing outflows. We study transactions where the selling firm sells minority equity stakes it holds in publicly-listed third parties. In these transactions, market prices from frequent trades in the shares of those third parties are available and the transaction prices received by the sellers are reported. We estimate the industry-adjusted distressed sale discount based on the four-week window to be about 8-9% while controlling for the firm size, stock liquidity and other factors. This discount magnitude is higher than the 4% estimated for forced sales of stocks by mutual funds without the benefit of transaction prices. The discount we estimate doubles if the stake sold is more than 10% of the firm. Prices recover after the distressed sale.

Key Words: Fire Sale, Liquidity, Distressed Sale, Price Recovery

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Asset fire sales--namely, the forced sales by distressed sellers at prices lower than what the highest potential bidder could bid if it was not financially constrained as studied by Shleifer and Vishny (1992)--have attracted much attention. They have become important building blocks in much of recent theoretical work in finance and macroeconomics including that on limits to arbitrage, credit cycles, and financial crises.[1] It has also been shown empirically that the possibility of asset fire sales affects financial contracting, cost of capital and corporate takeovers.[2]

Empirical evidence on fire sales falls into two groups. In the first group are studies such as the analysis of aircraft sales by distressed airlines in Pulvino (1998). These studies observe the transaction prices on asset sales but have to infer the fundamental values of the assets sold without the benefit of prices from a market with frequent trades. The second group includes studies such as Coval and Stafford (2007) who study the price impact of the sales of equity securities by mutual funds facing fund outflows. These studies have the benefit of asset prices from frequent trades but they do not observe the transaction price received by the distressed sellers. They instead focus on the long run price impacts of the distressed sellers' act of selling. There have been no empirical studies in a setting that provides both the transaction prices received by the distressed sellers and the pre-transaction prices given by frequent trades in an active market.

In this paper, we study transactions where the selling firm sells minority equity stakes it holds in publicly-listed third parties. These particular transactions have several advantages for a study like ours. First, the seller is not selling its own equity. In other words, these transactions are not seasoned equity issues. Instead, the shares in third parties are sold.

[1] See, e.g., Shleifer and Vishny (1997), Kiyotaki and Moore (1995), Gromb and Vayanos (2002), Brunnermeier and Pedersen (2009), Caballero and Simsek (2013). Shleifer and Vishny (2011) provides a survey.
[2] See Benmelech and Bergman (2009, 2011), Ortiz-Molina and Phillips (2010) and Edmans, Goldstein, and Jiang (2012).

Hence, the impact of the factors behind the seller's distress on the value of the asset being sold is reduced. Second, the assets sold are publicly-listed shares, which tend to be more frequently traded than debt securities or real assets, so their pre-transaction market prices can serve as a good estimate for their fundamental values. Third, the transaction prices received by the sellers are often included in press releases or press reports and thus can be obtained from commercial data providers. Finally, in addition to providing more precise estimates of fire sale discounts, focusing on equity securities has the benefit of generating insights about fire sales of financial assets that play an important role in financial crises as surveyed in Shleifer and Vishny (2011).

We study 638 minority equity sales with a 3.7% average stake size and find statistically and economically significant discounts in distressed deals. The industry-adjusted discounts based on target stock price four weeks prior to the announcement are about 8% while unadjusted discounts range from 18% to 20% on average depending on the specification.[3] These discounts are higher if the fraction of the target's equity being sold is large. For example, when the stake size sold is 10% or larger, the industry-adjusted distress discount doubles.

Notice that the industry-adjusted discounts of 7-8% that we estimate even for the sale of smaller stakes is higher than the discounts estimated for equities using mutual fund cash outflows, which are estimated without the benefit of observed transaction prices. For example, both Coval and Stafford (2007) and Edmans et al. (2012) estimate a discount of about 4% during their three-month event window. In other words, our more precise data on

[3] Although we provide both sets of estimates, we focus on the regression-based industry adjustment as Gormley and Matsa (2014) show that the traditional industry adjustment can lead to inconsistent estimates. When we use the industry adjustment commonly used in the literature, namely adjusting the deal premiums with the industry returns during that period, the industry-adjusted discount range from 12% to 14%. See the regression analysis section for more detail.

the timing of the sale--often to the day of sale-- as well as data on the transaction price allow us to provide more precise estimates of fire sale discounts, which are not only higher than those in the literature but are also based on price movements over four weeks rather than three months. In fact, even our fire sale discount estimates using only one-day price changes are about 5% industry adjusted. As a further comparison to fire sale discounts in the literature, the discounts we estimate for smaller stake sales are comparable to the lower end of the 10-20% discount estimated by Pulvino (1998) for aircraft sales but the discount we estimate for larger stakes is at his higher end. Interestingly, we find no discount in the sale of large stakes in non-distressed deals.

Sellers of equity stakes may possess preferential information about the firm. To check whether our results are driven by such information, we also study how the prices behave after the sale. If the sales are motivated by information held by the sellers at the time of distress, the price impact of the sale would be expected to last. However, if the price impact is due to fire sale reasons, market prices of the asset sold should recover after the sale. We indeed find a clear pattern of price recovery after distressed sales. The industry-adjusted cumulative returns become statistically indistinguishable from zero as quickly as two months after the sale, while it takes about eleven months for the point estimates to climb gradually and reach zero in line with Coval & Stafford (2007) and Edmans et al. (2012). This finding suggests that the distressed sale discount we find is likely due to liquidity rather than any adverse information held by the seller about the asset sold. This result also indicates that the price impact of distressed sales takes time to reverse even in relatively liquid markets like the U.S. equity market.

Since prior literature shows that firms try to avoid forced sales of assets in illiquid markets (e.g., Schlingemann, Stulz, and Walkling (2002) and Almeida, Campello, and

Heckbarth (2009)), we control for the liquidity of the asset being sold. Our results are also robust to identifying distressed deals in different ways as well as to controlling for the target size and other target characteristics such as book leverage, market-to-book, profitability, and the preceding 12-month returns. Importantly, our results are not sensitive to excluding the crisis years of 2007 and 2008.

Our paper contributes to the empirical fire sales literature. Prior research often does not have the benefit of a market with frequent trades, starting with Pulvino (1998) who had to estimate the fundamental values of aircraft sold. Other papers that study the fire sales discount in markets with infrequent trades include Acharya, Bharath and Srinivasan (2007) who study the role of industry distress and asset specificity in creditor recoveries; Eckbo and Thorburn (2008) who analyze fire sales in bankruptcy auctions; Campbell, Giglio and Pathak (2011) who study the impact of foreclosure sales on home prices; and Ellul, Jotikasthira, and Lundblad (2011), who study the price impact of corporate bond sales by insurance companies due to regulatory pressures. Merrill, Nadauld, Stulz, and Sherlund (2014) also examine the role of capital requirements but in the sale of distressed mortgage-backed securities by insurance companies. They estimate fundamental value from a fundamental model while we use market prices from frequent trades. Our paper shares the focus of all these papers but has the benefit of estimating the fundamental value of the assets sold using pre-transaction market prices based on much more frequent trades. In that respect, our paper is similar to Weitzel et al. (2014) who study the European corporate takeovers but do not find any evidence for fire sale FDIs.

A second set of empirical fire sale studies focuses on the price impact of forced sales in assets that trade more frequently. This literature starts with Coval and Stafford (2007) who analyze the long run price impact of forced sales of equity securities induced by mutual fund

outflows without observing the prices received by the selling funds. Edmans, Goldstein, and Jiang (2012) use these forced sales by mutual funds as an instrument for the impact of prices on corporate takeovers. Our paper shares the focus on financial assets with these papers but our emphasis is on estimating the discount at the time of sale as we observe the prices obtained by distressed sellers.

Finally, several papers have studied block trades and found significant deal premiums in the range of 15 to 20 percent (see Barclay and Holderness, 1989, Dyck and Zingales, 2004). We study a very different sample of equity sales. Whereas block trades are usually large stakes with average block size greater than 20% and often above 50% and are privately negotiated with one buyer who is interested in control, we focus on a sample of mostly open market equity sales with much smaller stake size (3.7%) to dispersed buyers. In fact, we exclude deals where the stake size is 50% or more to minimize the concerns about control premium.

This paper is organized as follows. The next section presents the data. The second and third sections provide the regression analysis followed by a discussion of robustness. The fourth section discusses the effect of stake size sold. Finally we conclude.

1. Data

1.1 Sample and Terminology

We use several sources to construct the sample of firms involved in asset sales. From the Zephyr database by Bureau Van Dijk, we obtain all deals where the seller sells stakes in public US firms. We drop deals that involve seasoned equity issues or have missing deal value or stake size. We focus on the period 2000 to 2012. We also exclude the deals where the deal type is one of the following: merger, demerger, joint-venture, IPO, share buyback,

bankruptcy, cash free, build-up, capital-pool, government, buyout, and reverse-takeover. The deals where the majority stake is transferred are not included in our sample so that possible effects of control changes are not reflected in our results. We exclude sellers who are individuals since we use seller's industry information for our main analysis. Since financial firms have high leverage and are subject to regulatory concerns, we also exclude deals where stakes in financial firms (with SIC codes 6000-6999) are sold to ensure that our results are not driven by skewed observations.

Although the data set is the same as the one used for Mergers and Acquisitions, and therefore, shares the same terminology with M&A deals, it is worth emphasizing differences in our context. The party that sells the stake is referred to as the *seller* and the buyer as the *acquirer*.[4] The stake sold is the equity share in another firm referred to as the *target* – even though, unlike in mergers, the target firm has no active role in the transactions we study. Similarly, acquirers in our stake sales are often unknown probably because the sale might be made to many diffuse acquirers or because the acquirer is not under any obligation to disclose itself due to the small stake size involved in the transaction. This is unlike mergers, where the acquirers often initiate the deal and are known. The deal is announced on the *announcement day* but the typical deal is also closed on or by that day. In other words, a typical announcement is not an offer or intention unlike in the mergers of public firms but, instead, it is the disclosure of a deal that has already closed. Hence, unlike the mergers of public firms, the announcement day is often the recorded *closing day* of the deal in our sample of transactions of minority stakes. Despite these differences, we will use this terminology in our study to reflect the source of our data.

[4] Unlike mergers studies that focus on the purchase of the stakes, we focus on the selling of these stakes. Though we do not have information on when and why these small equity stakes were purchased by the seller at the first place, there is a large literature on motives of minority stake purchases (see Allen and Phillips (2000), Fee, Hadlock, and Thomas (2006), Ouimet (2013), and Liao (2014)).

We then match target firms as well as the public sellers and acquirers with merged CRSP/Compustat data using both Stock Exchange Daily Official List (SEDOL) and International Securities Identification Number (ISIN) and manually check the firm names to further ensure the accuracy of the match. We end up with a sample of 638 asset sales where we have information on all the control variables. 473 of the equity stake sales are by a financial firm (with SIC code between 6000 and 6999) and 165 are by a non-financial corporation.[5]

We calculate the four-week deal premium using the share price of the target firms four weeks prior to the offer. This is a shorter window compared to the two or three months often used by M&A research on offer premiums (see Eckbo, 2009). Our goal is to provide as precise an estimate as possible yet to remain relatively free of market anticipation of the pending sales. To calculate four-week deal premiums, we subtract one from the ratio of transaction share price to the stock price four weeks prior to the announcement of the deal. We use hand-collected transaction share prices from deal comments in Zephyr when they are not explicitly reported in tabulated format. For the remaining deals where the total deal value and the stake sold are reported instead of the transaction share price, we use the total deal value divided by the percentage acquired and the number of shares outstanding to calculate the transaction share price. For deals that are announced on a weekend or on a holiday, we use the stock price of the nearest weekday prior to the announcement. To reduce the effect of outliers in our data, we trim our premium measures at the upper and lower 2.5%. We then obtain all the accounting variables as of the most recent annual accounting statement before the deal announcement.

[5] Note that only 40% of the distress sellers in our sample are financial firms.

For the sellers in our study, we use distress measures constructed at two different levels. First, for a third of our sample, we have detailed firm-level data for the sellers so we can construct firm-level seller distress measures and perform our regression analysis in this subsample. Unfortunately, the resulting sample is fairly small so we do the bulk of our analysis by using the seller industry distress as a proxy for the seller firm-level distress. As we discuss below, we verify in Table 1 Panel C that our seller distress proxy based on the industry-level data is indeed a good proxy at least for the subsample of deals for which we have firm-level data for the sellers.

Given the definition of a fire sale, we also need a measure of distress for the potential buyers of the seller's stake so we can capture the distress in potential financiers who invest in the target's industry. As also emphasized by Shleifer and Vishny (2011), fire sales have acquired a different meaning in financial markets with active trades by many participants. We use target industry distress to capture both the distress of potential strategic buyers in the target's industry but also the distress of the potential financial investors such as mutual funds investing in that industry. If the industry is in a downturn, the mutual funds or hedge funds investing in that industry are likely to be experiencing low returns and high cash outflows, which could limit their capacity for further investment.

To assess the industry health of the target and the seller, we calculate 6-month cumulative returns centered at the deal announcement date of the median firm for the 48 Fama-French industries. We define industry distress as a binary variable that takes the value of one if a firm's primary industry experiences a 20% decline in its median return during the six-month period centered on the deal announcement date. In the bulk of our analyses, we classify a deal as distressed when both the target's and the seller's industries are in distress. For robustness, we also construct alternative distress measures that are based on seller

industry only, seller firm-level distress, alternative industry definitions such as 2-digit SIC codes or 3-digit SIC codes, as well as two distress measures based on a twelve-month period and a lagged six-month period as explained in more detail in the Robustness section.

1.2 Summary Statistics

Table 1 presents the summary statistics for the full sample in Panel A and then for the subsamples of distressed deals and non-distressed deals in Panel B. Panel C summarizes seller firm-level distress measures for the subsample of deals where sellers are publicly listed. In addition to various measures of deal premium and industry distress, we present dummy variables for listed seller, US seller, financial seller, >=10% stakes, and unknown acquirer. We also include the following deal characteristics: the logarithm of the book value of the target firm's total assets, target turnover as the median ratio of daily trading volume to total number of shares outstanding during the four-week period that ends four weeks before the announcement (so that the timing does not overlap with the premium window), target leverage as the target's debt divided by the sum of debt and equity (all in book values), target market-to-book as target's market value of equity divided by its book value of equity, target return on assets as target's EBITDA divided by the book value of the target's assets, all of which are winsorized at the 1% and 99% level.

The average four-week deal premium in asset sales is 3%. The median value is 2% while the standard deviation is 20%. Between 4% and 7% of the sample deals are in distressed industries depending on the distress measure. As described above, our main distress measure is based on industry median return during the six-month period centered around the announcement day with the industry classification based on the Fama-French 48 industries. Other distress measures differ in the industry definition used, the return window

employed, or whether the return window is centered on the announcement day or immediately precedes the announcement day.

On average, target firms have $29 billion in total assets, 26% book leverage, 8% ROA, 1.78 market-to-book ratio, and 0.011 daily turnover ratio. Median values are comparable except for total assets where the median is slightly less than $1B. 83% of the sellers are US firms, 74% are in financial industries, and only 34% of the sellers are publicly listed. The average (median) total assets for the sellers amount to $250 (33) billion. Most of the deals involve small stake sizes with the mean (median) stake size being 6.17% (3.72%). We have very little information on the acquirers as the acquirers are not reported in 92% of the deals. This may be due to the fact the stakes are often sold on open market and are not large enough to require disclosure by the acquirer.

We then split the sample based on our main deal distress measure. Deal premiums are significantly lower in the distressed sample (-18% for four-week premium) than in the non-distressed sample (4% for four-week premium). Figure 1 shows the difference in deal premium between distressed and non-distressed industries more clearly. We present both the 4-week premium and equal-weighted industry adjusted 4-week premium for the firm whose shares are sold by the seller. Industry-adjusted deal premiums are still significantly lower in the distressed sample (-12% for four-week premium) than in the non-distressed sample (0.8%).

Turning to other variables, there is some evidence that target firms in distressed deals have slightly larger size, lower leverage, and higher market-to-book ratio, but they are similar to targets in non-distressed industries in terms of ROA. Turnover ratio is much higher for target firms in distressed deals than those in non-distressed deals, which suggests that the equity securities sold in distressed deals are actually more liquid on average. There is no

significant difference in the size of the stakes sold between distressed and non-distressed deals. Finally, sellers are more likely to be listed, in non-financial sectors, and slightly smaller in the distressed sample than that in the non-distressed sample.

As discussed above, in an ideal setting, one would use the direct firm-level distress measures for the seller's distress instead of using an industry-level proxy. Although our results are robust to this subsample where we can construct firm-level seller's distress measures, we have to rely on our distress proxy based on the industry-level data for the bulk of our analysis. Hence, we first check whether industry-level seller distress is a good proxy for the firm-level seller distress by focusing on the subsample of publicly listed sellers, for which we have detailed data. More specifically, we calculate 6-month returns centered at the deal announcement date for the listed selling firm. We present four different measures: a binary variable that takes the value of one if the selling firm experienced a 20% decline during the six month period centered around the deal announcement date, the 6-month returns, the 6-month returns in excess of the equally-weighted industry returns, and the 6-month returns in excess of the value-weighted industry returns. As is clear from Panel C, sellers experienced much lower returns in the distressed sample compared to the non-distressed sample defined by industry health. In the distressed deal sample, 64% of the listed sellers are classified as distressed based on firm-level distress measure compared to 11% in the non-distressed sample. In general, both the mean and the median raw and industry-adjusted returns for sellers are lower in distressed deals (as classified using the industry health) and these differences are statistically significant. In other words, seller industry distress seems to be a good proxy for seller firm-level distress.

2. Regression Analysis

We can state our null hypothesis as follows.

H_0: The premium offered by the acquirer for the target's shares does not depend on the health of the target's and the seller's industries.

Our regression analysis is designed to test whether this null hypothesis can be rejected.

2.1 Industry Unadjusted Deal Premium

Our estimation equation is given by

(1) $$DealPremium = \alpha + \beta Distress + \gamma \mathbf{X} + \varepsilon,$$

where *DealPremium* is the premium offered--or already paid, as most of the deal announcements in our sample coincide with the actual closing of the deal--by the acquirer on the announcement day relative to the stock price four weeks prior to the announcement. Our main hypothesis variable *Distress* is a binary variable that takes the value of one if both the seller's and the target's industries are in distress at the time of deal announcement. We use Fama-French 48 industries and do not require the seller and the target to be in the same industry. In the main analysis, we consider an industry as distressed if the median industry return during the six-month window centered on the announcement day is -20% or lower. Control variables **X** include deal- and target-variables as well as target industry and year fixed effects. We cluster the standard errors at the target industry-year level.

As discussed in detail in the previous section, the target industry distress captures the fact that potential buyers for the stake being sold such as investment funds or investors specializing in that industry may be experiencing declines in their portfolios and may thus be restricted in their ability to bid for the stake. Other firms in the target industry that could be

strategic buyers of the stake may also be constrained when the whole industry is in distress. The seller industry distress, on the other hand, acts as a proxy for the seller's distress because we have data at the firm-level for only a minority of the sellers in the sample. As discussed above, Table 1 Panel C suggests that it is a good proxy.[6] The analysis on the small subsample, for which we can construct more precise firm-level seller distress measures, is presented later and confirms our main findings.

We present the results from estimating equation (1) in Table 2. In all regressions, we include the natural logarithm of the book value of the target's assets to control for target size, the natural logarithm of the acquired stake size, and the target's stock turnover to control for the liquidity of the target's stock. Our main hypothesis variable *Distress* has a negative coefficient that is statistically significant at the 1% level. This indicates that the premium offered by the acquirer over the target's share price four weeks prior to the announcement is lower if both the target and the seller industries are in distress.

We then repeat the regression with the addition of target-level controls, including book leverage, market-to-book ratio, and return on assets. We find that firm size, stake size, and market-to-book ratio tend to have statistically significant negative coefficients, consistent with Eckbo (2009). However, our main variable, *Distress*, continues to have a negative and statistically significant coefficient, confirming that the premium offered by the acquirers is lower when the target and seller are in distressed industries.

The results are also economically significant. Our estimates range from -18% to -20%. This is a substantial discount incurred by the sellers when both they and the target are in distressed industries. Given that the assets being sold, namely shares in listed companies,

[6] Unfortunately, it is not feasible to distinguish the effect of target industry distress from that of the seller industry distress with precision in our sample because the correlation between the two is quite high (0.61).

are likely among the most liquid assets held by corporations after their cash equivalents, the discount in the fire sale of other assets is likely to be larger. Notice also that the coefficient estimates are not only statistically very significant but that they also fall within a fairly tight range, which suggests that our distressed industry indicator is unlikely to be representing some other effect.

2.2 Industry Adjusted Deal Premium

Since our distress measures are at the industry-level, it is important to account for the industry cycles by repeating the analysis with the deal premium adjusted for the target's industry returns. We first estimate equation (1) with the dependent variable replaced by the premium in excess of the equal-weighted industry return during that period. The results are presented in models (3) and (4) of Table 2. The coefficient of the distress indicator is about a third lower in absolute value but it is still significant at the 5% level.

Although this has been a common method for industry adjustment, Gormley and Matsa (2014) show that this method actually leads to inconsistent estimates.[7] They instead recommend regression-based adjustments where the sample consists of *all* the firms in the industry for which the returns are adjusted and the regression includes industry-period fixed effects. Hence, we run the following regression:

$$(2) \qquad r_{ij} = \alpha_i + \beta Target_{ij} + \delta Target_{ij} * Distress_i + \boldsymbol{\gamma} \mathbf{X}_{ij} + \varepsilon_{ij},$$

where r is the 4-week stock return up to and including the announcement date of deal i for firm j that is in the same industry as the target of deal i, *target* is a binary variable takes the value of one if the firm is the target itself in deal i and zero otherwise, *Distress* is the same as in (1). For the target in deal i, we substitute *DealPremium* as defined above for r to study the

[7] We thank Todd Gormley for discussing the use of this approach in our setting.

fire sale discount. In other words, the regressions now include not just the target but all the firms in the target's industry. Gormley and Matsa (2014) approach calls for the inclusion of industry*period interaction fixed effects, which would be industry*announcement day interaction fixed effects in our setting as we study the four-week return ending on the announcement day. Since we do not have any deals announced on the same day in the same target industry, these interaction effects are econometrically equivalent to deal fixed effects α. Since only one firm, the target, has a transaction in its industry on the same announcement day, any deal-level characteristics, such as stake size, or target characteristics such as target market-to-book ratio will have to be the same for the firms from the target's industry on the day of announcement. These characteristics are subsumed by the deal fixed effects. As the regressions now include observations for all the firms in the target's industry around the announcement day, they contain a much larger number of observations as reflected in the number of observations row. The standard errors are corrected for clustering of observations at the deal level.

We present the results in models (5) and (6) of Table 2. The first industry-adjusted regression includes only the target indicator and the interaction of the target indicator and the distress indicator as well as the deal (industry-period) fixed effects. The target indicator does not have a significant coefficient, which suggests that the stakes sold in our sample do not enjoy a premium or a discount on average. Our focus, however, is the interaction term of the target and distress indicators to differentiate the stakes sold when both target and the seller are in distressed industries. This interaction term has a negative and significant coefficient at the 1% level, which indicates that the sales in distressed deals are subject to a discount on average.

We next control for the size of each firm by the logarithm of its book assets and its stock turnover; both variables will help control for the stock liquidity among other factors. The deal (industry-period) fixed effects naturally subsume any deal-level controls such as target leverage, target market-to-book, or target ROA. The interaction term of target and distress indicators again has a negative coefficient that is statistically significant at the 5% level. In other words, the discount for stakes sold in distressed deals is robust to adjusting for industry returns as well as firm-level controls.

The magnitude of the discount is still large at 8% to 9%. It is worth emphasizing that this estimated discount is about twice as high as the approximately 4% that was estimated for forced sales in equity securities by mutual funds in Coval and Stafford (2007) and Edmans et al. (2012) over their three-month event window. Of course, our sample is not the same as theirs because we are not analyzing portfolio trades like they do. Nevertheless, data on transaction prices as well as more precise data about the transaction date than what is available from mutual fund disclosures allow us a more precise estimate of fire sale discounts in equity securities. This precision translates into higher fire sale discounts estimated. Furthermore, our estimates are based on price movements over a shorter period of time, namely, four weeks, rather than three months that quarterly mutual fund disclosures allow.

2.3 Seller Characteristics

We now check the robustness of our results to distress at the seller firm level as opposed to seller industry level as in the main analysis. Unfortunately, as mentioned before, only about one third of our deals have a publicly-listed seller so these tests have limited power. Yet, we can construct firm-level distress measures for this small subsample. In

particular, we can construct distress measures based on the seller's cash flow using the most recent accounting statements before the announcement date. For this subsample, we consider the seller in distress if its coverage ratio is less than one in its most recent accounting statement before the deal announcement. In these tests using accounting-based measures, we also exclude financial sellers since they use different accounting methods and, therefore, end up with only 136 deals.

The results are presented in Table 3, which repeats the main analysis in Table 2 for this small subsample of sellers with available firm-level data. With seller distress defined based on the seller's coverage ratio, the results are similar to those in Table 2. When the unadjusted premium is considered in regressions (1) and (2), the premiums in deals with sellers that have coverage ratio less than one are lower and this discount is significant at the 5 or 10% level depending on the specification. When we use regression-based industry adjustment, the focus shifts to the interaction term *target*distress* as before. This term again has a negative coefficient that is statistically significant at the 10% level.

These results suggest that our main results are robust in the small subsample where we can construct seller firm-level distress measures based on the seller's coverage ratio even though the small sample leads to limited statistical power.

2.4 Price recovery

It is important to distinguish our findings from the effect of information the sellers might potentially have about the target firm. Of course, the *target* binary variable in the regressions 5 and 6 above can capture the information effect the sellers might have in general but the sellers' information advantage might be especially pronounced during distress. To rule out the possibility of a differential information effect, we study in this

subsection the price movements after the sale. If the discount we document above is due to the sellers' superior information about the target during distress, one would expect the price impact we find to be long lasting. On the other hand, if the discount documented above is indeed a fire sale discount, one would expect a price recovery in due course after the sale. In this subsection, we show that such price recovery indeed occurs.

We first study four-week returns before and after the announcement day. We adjust for industry returns in a regression-based framework as above. More specifically, we repeat equation (2) for four different four-week periods: t=-1, 0, 1, 2, where t=0 is the same four-week period that ends on and includes the announcement day as in the previous table (that regression is duplicated in this table for convenience). The results are presented in Table 4 Panel A.

We do not see any significant return for the target firm in t=-1 when the deal is distressed. This period also serves as placebo. There is a major discount for distressed deals in t=0 as already seen above but there is no statistically significant negative or positive return at t=1, the first four-week period following –and excluding- the announcement day. This is followed by a 10% return at t=2 for distressed deals as indicated by the coefficient of the interaction term *target*distress* as before; this positive return is statistically significant at the 1% level in regression (4). In other words, roughly during the second month after the announcement day, the distressed discount of about 8-9% is reversed, all industry-adjusted. This pattern holds if the firm size and stock liquidity are controlled for as in regressions (5) through (8).[8]

[8] In unreported tables, we also include firm-level variables such as market capitalization, market-to-book equity, and the preceding 12-month returns. Our results are robust to the additional controls.

We repeat these regressions for all the periods from t-12 to t+12 and plot the sum of *target* and *target*distress* coefficients in Figure 2 together with 95% confidence interval. The returns are statistically indistinguishable from zero in all the four-week periods t<0. In other words, the returns to target stock in distressed deals are not distinguishable from industry returns before the sale. This is followed by a negative and statistically significant return in t=0, the four-week period that ends on and includes the sale, and a positive return in t=2, as shown above. Returns in subsequent four-week periods are again statistically indistinguishable from industry returns. In other words, the fire sale discount is followed by a positive return about two months later but the period returns are not statistically different from zero in any other period.

We then check cumulative returns using the end of t=-1, that is four weeks before the announcement day, as the base by using cumulative returns as the dependent variable in equation (2). The results are presented in Table 4 Panel B. The interaction term *target*distress* for t=1 has a negative and significant coefficient at the 1% or 5% levels. This finding confirms that the price does not recover yet during the first month after a distressed sale. This interaction term no longer has a statistically significant coefficient for t=2 and t=3, which suggests that the target stock price after a distressed deal is no longer statistically different from the cumulative return after a non-distressed deal about two months after the announcement day.

We repeat these regressions for all the periods from 0 to 12 and plot the sum of *target* and *target*distress* coefficients in Figure 3 together with 95% confidence interval. The industry-adjusted cumulative returns for the target in distressed deals are negative and statistically significant in t=0 and 1 as the regressions above indicate. However, cumulative returns in four-week periods starting in t=2 are no longer statistically distinguishable from

industry returns. In other words, the stock price statistically recovers from the impact of the fire sale discount in about two months after the sale. We should, however, note that, although cumulative returns become statistically indistinguishable from zero starting in the second month, the point estimates of cumulative returns remain negative until the eleventh month, which is similar to the recovery duration in Coval and Stafford (2007) and Edmans et al. (2012). Although the general tendency of price recovery is clear in our tests as shown in Fig. 3, pinpointing the exact price recovery duration is likely to suffer from small statistical power given the relatively small number of distressed deals. Hence, the main message of Fig. 3 is the overall pattern of price recovery rather than its duration.

We now move to the robustness checks for this distressed industry discount using the regression-based industry adjustment framework. For industry unadjusted regression results, please refer to Table A to Table D in the online appendix.

3. Robustness

3.1 Alternative Distress Definition

In the main analysis, we classify an industry as distressed if the median return in that industry over the six-month period centered on the deal announcement date is -20% or less. We like this distress measure because it can capture the distress in a timely manner. However, there may also be a concern that its contemporaneous nature may confound the analysis so we first check the robustness of this construction by considering a lagged six-month period that ends one day before the announcement day. Our cutoff is again a -20% return during this period. The results are presented in Table 5. Our focus is the interaction term *target*distress*, which has a negative coefficient that is statistically significant at 1% level. The magnitude of this coefficient implies a fire sale discount of more than 8%. We then

construct the distress measure using twelve months centered on the announcement day instead of six months, this time with a -30% return threshold. The interaction term continues to have a negative coefficient that is statistically significant at the 1% level with a similar magnitude (see regressions (3) and (4)). Thirdly, we redefine our main 6-month distress measure, which is based on both target and seller industry health, to be based on the seller distress only. The results are economically and statistically similar to what we had before (ranging between 7% and 8%). Finally, in regressions (7) and (8), we use a weighted least squares regression method with market capitalization as the weights. While the earlier regressions are akin to using an equally-weighted industry adjustment, these weighted regressions are akin to value-weighted industry adjustments. Again, we find similar results as before with a fire sale discount of 9%. These results indicate the robustness of our main result to alternative construction of the distress measure.

3.2 One-day Premium

Following the literature on the takeover premium, we focus on the four-week premium, which is calculated using the price offered in the deal and the target's stock price four weeks prior. Although the use of a four-week window seems standard in the takeover literature, it may also be desirable to check the robustness of our results to the use of a shorter window. In particular, one-day premium window may be particularly informative in our case to the extent that the seller's stake is sold in only one day, including the open market transactions, and the intention to sell was not leaked to the market before the sale. We now repeat the previous analysis with one-day premium instead. The premium is calculated in the same manner but using the target's stock price one-day prior to the deal announcement instead. Given that this estimation window is very short, we focus on the

sample of deals where the announcement date is the same as the completion date. The results presented in Table 6 show that our main results are robust. The statistical significance is persistent while the magnitude of the estimated discount is more than half of what was estimated in the main analysis. This reduction might be due to information leakage about the sale before the announcement.

3.3 Alternative Industry Classifications

The industry classification affects the construction of our distressed industry indicator and, naturally, industry fixed effects. We use the Fama-French 48 industries as our industry classification in our main analysis. We repeat the main analysis with regression-based industry-adjustment by using 3-digit SIC classification instead and present the results in Table 7. Our focus is again the interaction term *target*distress*. This interaction term continues to have a negative coefficient that is statistically significant at the 1% level. The magnitude of the fire sale discount implied by this coefficient is more than 11%. We also repeat the analysis using 2-digit SIC classification. The interaction term again has a negative coefficient that is statistically significant at 5%. Hence, our results do not seem to be driven by the use of Fama-French industry classification as opposed to SIC industry classification.

3.4 Alternative Subsamples

Our sample period includes the crisis years of 2007 and 2008. Although we include industry*period fixed effects to adjust for industry, it is still worth determining whether our results are driven by the financial crisis. Only 94 deals (about 15% of the sample) are in years 2007 and 2008 and, in general, the deals are fairly well distributed over time in our sample with 2003 having larger number of deals. We repeat the main analysis by excluding deals

announced in 2007 and 2008. The results are presented in Table 8. The interaction term *target*distress* has a negative coefficient that is statistically significant at the 1% level. These results confirm that the fire sale effect we document is not just a result of the financial crisis but a broader phenomenon.

Finally, as the sellers are unlisted in the majority of the deals, it's worth checking whether our results are robust in the subsample of unlisted sellers. We find that the interaction term again has a negative and statistically significant coefficient.

In summary, our results are robust to alternative distress measures, industry definitions, and premium calculations. They are not sensitive to excluding the crisis year of 2007 and 2008 or listed sellers and are robust to using seller firm-level distress measures. It is worth noting that our results are also not unique to the regression-based industry adjustment method, though we prefer to use this method since the standard industry adjustment methods often leads to inconsistent estimates (see Gormley and Matsa, 2014). Table A to Table D in the online appendix further present all the standard industry unadjusted regressions for these robustness checks.

4. Stake Size Sold and Fire Sale Discount

In this section, we study how the fire sale discount is affected by the size of the stake sold. The stake size may affect the premium offered by the acquirer for at least two reasons. First, the sale of larger stakes may include a control premium. The control premium may also depend on the industry health, though Table 1 Panel B indicates that there is no statistically significant difference in the mean and median of the stake size based on industry health. Although we exclude majority transactions, where the stake size is larger than 50%, the control premium can also manifest itself in relatively larger stake sizes in our sample. Second,

the sale of larger stakes may have larger price impacts, which would reduce the premium offered by the acquirer. This price impact may also depend on the industry health.

To study the role of the stake size sold, we first split our sample based on whether the stake size of the deal is greater than or equal to 10% of the target or not. About 80% of the deals in our sample have stake sizes less than 10%. Table 9 repeats our main analysis with regression-based industry adjustment for these subsamples. The first two regressions are for the subsample of deals with stakes sold representing 10% or more of the target firm. The interaction term *target*distress* again has a negative and statistically significant coefficient at the 1% level. However, the magnitude of the fire sale discount implied is about 18%, which is about twice as high as the discount found for the whole sample. Interestingly, there is no discount for large stake sales in non-distressed deals.

We also repeat the analysis for the deals where the stake sold is less than 10% of the target. The interaction term still has a negative and a significant coefficient at the 5 or 10% level depending on the specification. These results indicate that corporate asset sales incur a discount when the target and seller industries are in distress regardless of the stake size sold but this discount is larger when the stake size is also larger.

5. Conclusion

We study asset fire sales where corporations sell equity they own in publicly listed third companies. Unlike in previous empirical studies, the assets here are frequently traded and the transaction prices received by the distressed sellers are observed. We find that the sellers receive an industry-adjusted discount of about 8-9% and an unadjusted discount in the range of 18-20% on average relative to the target stock price four weeks before the transaction when both the seller and the target are in distressed industries. This discount

increases with the stake size sold. These results are robust to controlling for many target-, seller-, and acquirer-level controls as well as for alternative industry classifications, distress and premium definitions, and estimation techniques. We show that the price recovers after distressed sales, suggesting that the distressed sale discount we find is likely due to liquidity rather than any adverse information held by the seller about the asset sold.

Our results on the fire sale discount are economically very significant but they are still likely to underestimate reality because we are limited to analyzing observed transactions. Many potential sellers may decide not to sell their assets if the fire sale discount they are likely to face is too large. Since such cases are not observed, we are likely to underestimate the fire sale discount. Our estimates may also provide a likely lower bound for fire sale discount in assets that are less liquid than equities such as debt securities or real assets.

We do not know why the sellers originally decided to acquire the equity stakes that they sell in our sample of deals. Such equity holdings may be 'strategic' in the sense that they are part of business ties between the seller and the target in our sample. However, given Duchin et al. (2013) they may also be financial investments where the companies keep their cash holdings. If so, our results indicate that these equity securities are a very risky way to keep any precautionary cash holdings because firms are likely to face large discounts when they need to use this precautionary reserve in a state of distress.

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Figure 1. Fire sale discount

This figure plots the 4-week premium and equal-weighted industry adjusted 4-week premium for the firm whose shares are sold by the seller. To calculate the four-week deal premium, we subtract one from the ratio of transaction share price to the stock price four weeks prior to the announcement of the deal. For the deals where the transaction share price is not directly available, we use the total deal value divided by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Distress is a binary variable that takes the value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. Industry classification is based on the 48 Fama-French industries.

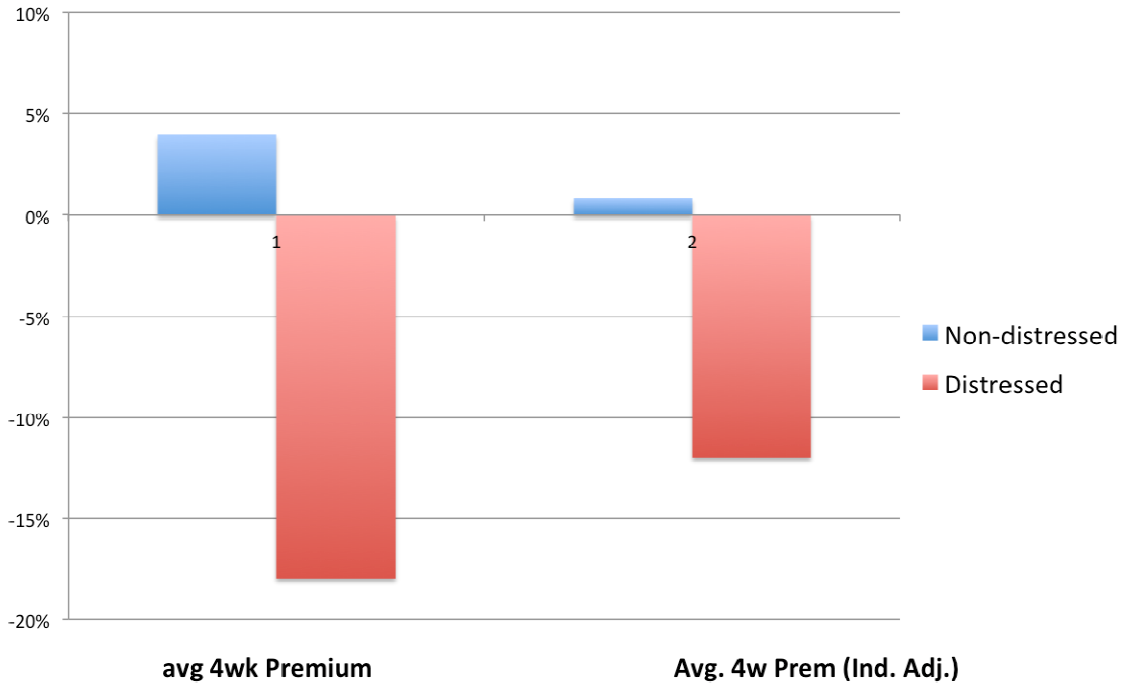

Figure 2. Fire sale discount and subsequent price recovery in distressed deals - Period returns

This figure plots the 4-week regression-based industry-adjusted returns (deal premium for t=0) for the firm whose shares are sold by the seller. Each point is given by the coefficients of *target* + *target*distress* in equation (2), see text in section 2.3 for details. Industry classification is based on the 48 Fama-French industries. Regressions include target industry*period fixed effects. 95% confidence intervals are also provided. Period t=0 is the four week period that ends on and includes the announcement day.

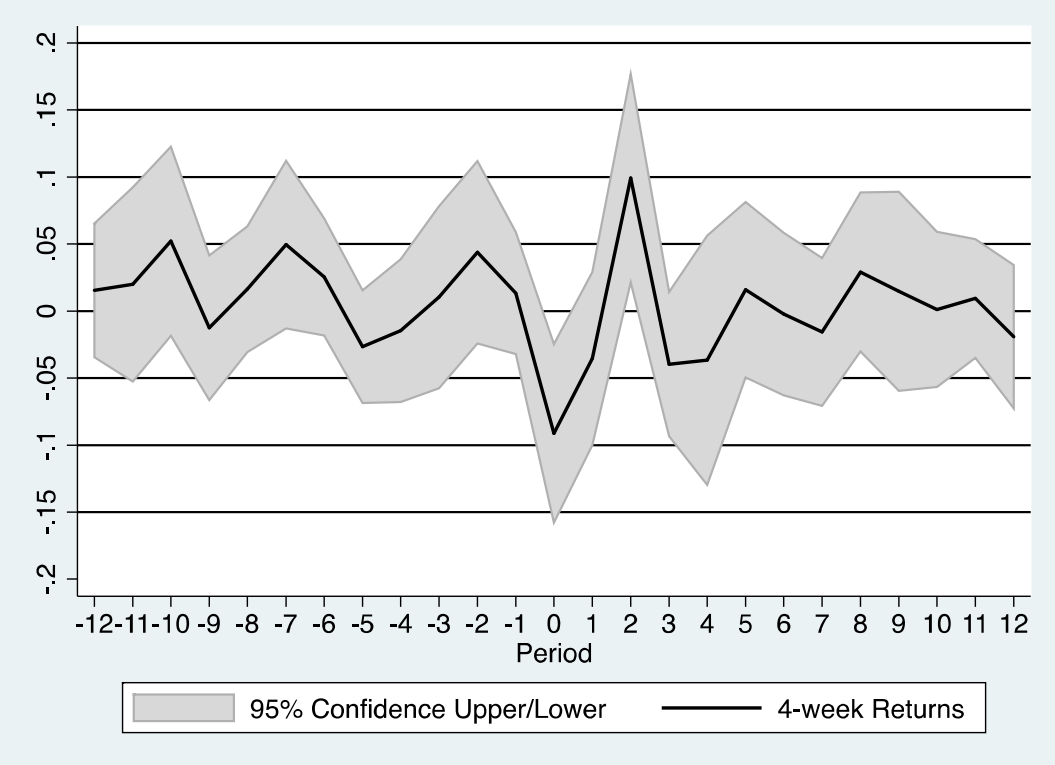

Figure 3. Fire sale discount and subsequent price recovery in distressed deals - Cumulative returns

This figure plots the regression-based industry-adjusted cumulative returns (deal premium for t=0) for the firm whose shares are sold by the seller. The benchmark is the stock price 4 weeks before the announcement day and each period is four weeks long. Each point is given by the coefficients of *target* + *target*distress* in equation (2) where the dependent variable (periodic return) is replaced by the cumulative return, see text in section 2.3 for details. Industry classification is based on the 48 Fama-French industries. Regressions include target industry*period fixed effects. 95% confidence intervals are also provided. Period t=0 is the four week period that ends on and includes the announcement day.

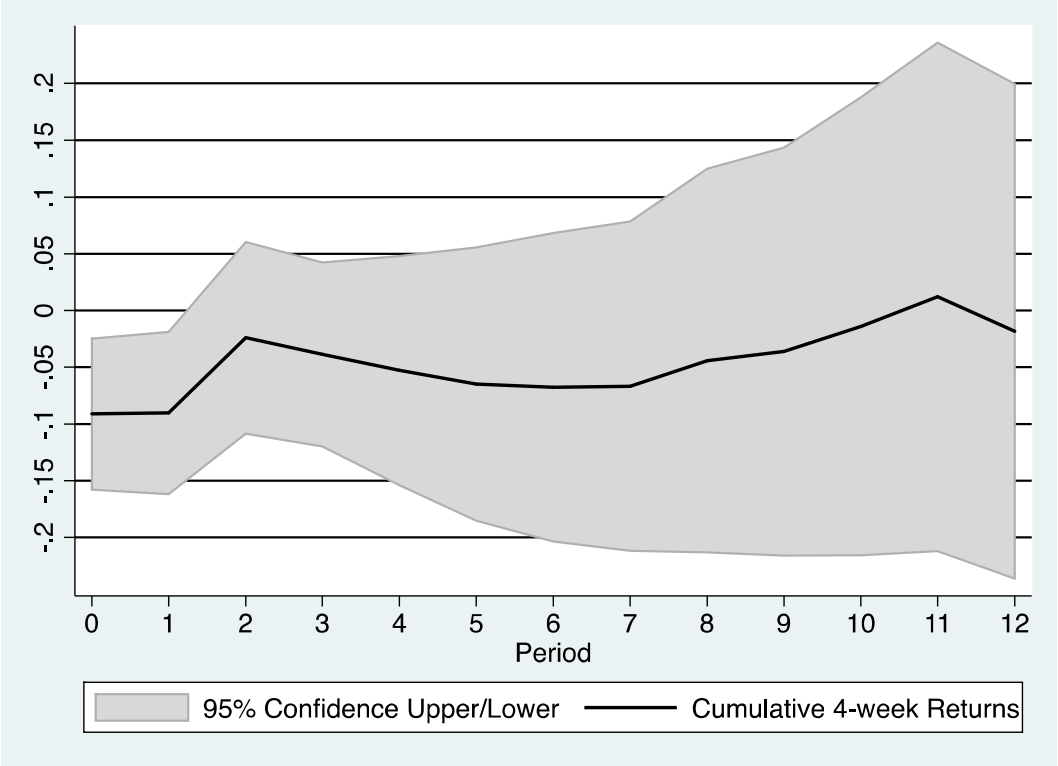

Table 1. Summary Statistics

This paper presents summary statistics for the full sample in Panel A and for the subsamples of distressed deals and non-distressed deals in Panel B. Panel C summarizes seller firm-level distress measures for the subsample of distressed deals and non-distressed deals. To calculate (industry adjusted) four-week deal premium, we subtract one from the ratio of transaction share price to the stock price four weeks prior to the announcement of the deal (and adjusted using weighted industry returns). For deals where the transaction share price is not directly available, we use the total deal value divided by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Distress is a binary variable that takes the value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six (or twelve) month period centered around the deal announcement date. Industry classification is based on the 48 Fama-French industries, SIC2, or SIC3, as specified in parentheses below. Target Assets is target's book value of assets; Turnover is the median daily ratio of the target's trade volume to total number of shares outstanding (in thousands) during the four-week period that ends four weeks prior to the announcement (so that the timing does not overlap with the premium window); Target Leverage is target debt divided by the target's debt plus equity, all in book values. Target Market-to-Book is target market value of equity divided by its book value of equity; Target Return on Assets is target EBITDA divided by the book value of the target's assets. All the accounting values are as of the most recent annual accounting statement before the deal announcement and are winsorized at the upper and lower 1% level. In Panel B, *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, using the mean difference test for the means and the Wilcoxon Ranksum test for the medians between subsample of non-distressed and distressed targets.

Panel A. Whole Sample

Variable	N	Mean	Std. Dev.	Median
Four-week Deal Premium	638	0.03	0.20	0.02
Industry adjusted Four-week Deal Premium	638	-0.01	0.19	-0.01
Distress (6 month, 48 FF Industry)	638	0.05	0.22	0.00
Distress (6 month, SiC2 Industry)	634	0.06	0.24	0.00
Distress (6 month, SIC3 Industry)	572	0.07	0.26	0.00
Distress (lagged 6 month, 48 FF Industry)	638	0.08	0.26	0.00
Distress (12 month, 48 FF Industry)	638	0.04	0.19	0.00
Target Assets (in Billions)	638	29	159	0.97
Target Leverage	638	0.26	0.26	0.21
Target Market-to-book	638	1.78	2.90	0.94
Target Return on Assets	638	0.08	0.22	0.10
Target Stock Turnover*1000	638	11.22	11.77	8.04
Seller Listed Dummy	565	0.34	0.47	0.00
Seller is a US Company (Dummy)	638	0.83	0.38	1.00
Seller is Financials (Dummy)	638	0.74	0.44	1.00
Seller Total Assets (in Billions)	164	250	443	33
Acquired Stake >= 10 Dummy	638	0.19	0.39	0.00
Acquired Stake Size (%)	638	6.17	7.62	3.72
Unknown Acquirers Dummy	638	0.92	0.27	1.00

Panel B. Distressed vs. Non-Distressed Deals

	Non-Distressed Deals				Distressed Deals			
	N	Mean	Std. Dev.	Median	N	Mean	Std. Dev.	Median
Four-week Deal Premium	606	0.04	0.19	0.03	32	-0.18***	0.25	-0.12***
Industry-adjusted Four-week Deal Premium	606	-0.00	0.18	-0.01	32	-0.12***	0.20	-0.01***
Target Assets (in Billions)	606	29	162	0.93	32	39	85	2.7**
Target Leverage	606	0.26	0.26	0.21	32	0.24	0.29	0.16***
Target Market-to-book	606	1.69	2.70	0.94	32	3.55***	5.16	1.26
Target Return on assets	606	0.08	0.22	0.10	32	0.03	0.21	0.06
Target Stock Turnover*1000	606	10.80	11.59	7.60	32	19.09***	12.45	14.67**
Seller Listed Dummy	534	0.33	0.47	0.00	31	0.55**	0.51	1.00**
Seller is a US Company (Dummy)	606	0.83	0.38	1.00	32	0.81	0.40	1.00
Seller is Financials (Dummy)	606	0.80	0.43	1.00	32	0.41***	0.50	0.00***
Seller Total Assets (in Billions)	148	264	457	33	13	27***	22	19
Acquired Stake >= 10 Dummy	606	0.19	0.40	0.00	32	0.13	0.34	0.00
Acquired Stake Size (%)	606	6.21	7.61	3.79	32	5.39	8.00	2.86
Unknown Acquirers Dummy	606	0.93	0.26	1.00	32	0.88	0.34	1.00

Panel C. Seller Firm-Level Distress

	Non-Distressed Deals				Distressed Deals			
	N	Mean	Std. Dev.	Median	N	Mean	Std. Dev.	Median
Seller Firm Distress (6m Returns<20%)	150	0.11	0.32	0.00	14	0.64***	0.50	1***
Seller Firm 6m Returns	150	0.11	0.33	0.11	14	-0.35***	0.28	-0.37***
Seller Firm 6m Returns (EW FF48 Adj)	150	-0.02	0.3	-0.06	14	-0.18**	0.27	-0.13*
Seller Firm 6m Returns (VW FF48 Adj)	150	0.04	0.27	0.02	14	-0.12**	0.27	-0.07**

Table 2. Fire Sale Discount in the Corporate Sale of Shares in Publicly Traded Companies

The table presents the OLS regression results. The dependent variable in Models 1 and 2 (3 and 4) is the four-week deal premium calculated as the (transaction share price at the announcement - share price four weeks before the announcement) over share price four weeks before the announcement (and adjusted by equally weighted industry returns). Premium is trimmed at the upper and lower 2.5% level. For the deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. The sample contains the targets of all the deals in models 1 to 4. Models 5 and 6 follow Gormley & Matsa (2014) where the sample includes all the firms in the target's industry, including the target (see text for details). The dependent variable in the Models 5 and 6 is the four-week deal premium for target firms and four-week returns for non-target firms in the same Fama-French industries. Distress is a binary variable that takes a value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. Industry classification is based on the 48 Fama-French industries. Target is a binary variable that equals one for the deal target. Log (Assets) is the logarithm of the firm's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding; Target Leverage is target debt divided by the target's debt plus equity, all in book values; Log (Acquired Stake Sizes) is the logarithm of the size of the acquired stakes. Target Market-to-Book is target market value of equity divided by its book value of equity; Target Return on Assets is target EBITDA divided by the book value of the target's assets. All the accounting values are as of the most recent annual accounting statement before the deal announcement and are winsorized at the upper and lower 1% level. The standard errors, corrected for clustering of observations at the target industry-year level in Models 1 through 4 and at the target industry*period level in models 5 and 6, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Industry Unadjusted		Industry Adjusted		Industry Adjusted (Gormley & Matsa (2014))	
Dependent Variable	4-week deal premium		4-week deal premium –		4-week return (deal premium for targets)	
	(1)	(2)	(3)	(4)	(5)	(6)
Distress	-0.201***	-0.178***	-0.137**	-0.117**		
	(0.0595)	(0.0588)	(0.0539)	(0.0538)		
Target					-0.000	0.001
					(0.0067)	(0.0068)
Distress*Target					-0.091***	-0.082**
					(0.0345)	(0.0362)
Log (Assets)	-0.007	-0.016**	-0.008	-0.015**		-0.002***
	(0.0048)	(0.0063)	(0.0047)	(0.0064)		(0.0005)
Turnover	0.000	0.001	-0.000	-0.000		-0.000
	(0.0009)	(0.0009)	(0.0008)	(0.0008)		(0.0001)
Log (Acquired Stake Size)	-0.009	-0.014***	-0.009	-0.013***		
	(0.0059)	(0.0053)	(0.0056)	(0.0050)		
Target Leverage		0.012		0.001		
		(0.0358)		(0.0333)		
Target Market-to-book		-0.011***		-0.010**		
		(0.0034)		(0.0042)		
Target Return on Assets		0.022		0.021		
		(0.0463)		(0.0440)		
Year Fixed Effects (FEs)	Yes	Yes	Yes	Yes	No	No
Industry FEs	Yes	Yes	Yes	Yes	No	No
Industry*Period FEs	No	No	No	No	Yes	Yes
Sample	Targets only	Targets only	Targets only	Targets only	All Firms in Target's Industry	All Firms in Target's Industry
Number of Deals	638	638	638	638	638	638
Number of Observations	638	638	638	638	224,890	153,496
R-squared	0.139	0.154	0.094	0.107	0.153	0.157
Target+Distress*Target	N/A	N/A	N/A	N/A	-0.091***	-0.081**
	N/A	N/A	N/A	N/A	(0.0339)	(0.0356)

Table 3. Fire Sale Discount: Firm-level Seller Distress

The dependent variables are the four-week premium for target firms and four-week returns for non-target firms in the same Fama-French industries as the target firm during the four-week period that ends on and includes the announcement day. We follow Gormley & Matsa (2014) where the sample includes all the firms in the target's industry, including the target in Models 3 and 4 (see text for details). The four-week deal premium is calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Distress is a binary variable that takes the value of one if seller's coverage ratio is less than 1. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding; Log (Acquired Stake Sizes) is the logarithm of the size of the acquired stakes. Target Leverage is the target's debt divided by the target's debt plus equity, all in book values; target Market-to-Book is the target's market value of equity divided by its book value of equity; Target Return on Assets is the target's EBITDA divided by the book value of the target's assets. All accounting values are as of the most recent annual accounting statement before the deal announcement and are winsorized at the upper and lower 1% level. Regressions include target industry*period fixed effects. The standard errors, corrected for clustering of observations at the target industry-year level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Industry Unadjusted		Industry Adjusted (Gormley & Matsa (2014))	
Dependent Variables	4-week deal premium		4-week return (deal premium for targets)	
	(1)	(2)	(3)	(4)
Distress	-0.138**	-0.124*		
	(0.0614)	(0.0705)		
Distress*Target			-0.078*	-0.074*
			(0.0398)	(0.0394)
Target			-0.001	-0.005
			(0.0148)	(0.015)
Log (Target Assets)	-0.008	0.003		-0.002**
	(0.0109)	(0.0162)		(0.0011)
Turnover	0.002	0.003		-0.000
	(0.0025)	(0.0025)		(0.0001)
Log (Acquired Stake Size)	-0.012	-0.014		
	(0.0114)	(0.0119)		
Target Leverage		0.049		
		(0.1054)		
Target Market-to-book		0.001		
		(0.0077)		
Target Return on Assets		-0.056		
		(0.1013)		
Seller Total Assets	-0.005	-0.008		
	(0.0090)	(0.0095)		
Year Fixed Effects	Yes	Yes	No	No
Industry Fixed Effects	Yes	Yes	No	No
Industry*Period FE	No	No	Yes	Yes
Sample	Targets Only	Targets Only	All Firms in Targets' Industry	All Firms in Targets' Industry
Number of Deals	139	136	139	136
Number of Observations	139	136	33,246	31,279
R-squared	0.309	0.336	0.152	0.161

Table 4. Price-Recovery After Fire Sales

The tables report industry-adjusted regressions following Gormley & Matsa (2014). The sample contains all the firms in the target's industry, including the target (see text for details). The dependent variable in Panel A is each firm's stock return during various four-week periods; period 0 is the four-week period that ends on and includes the announcement day. The dependent variable in Panel B is each firm's cumulative stock returns since four weeks before the announcement day (end of period t=-1). The target's stock return at t=0 is replaced by the four-week deal premium calculated as the (transaction share price at the announcement - share price four weeks before the announcement) over share price four weeks before the announcement with the premium trimmed at the upper and lower 2.5% level. Distress is a binary variable that takes the value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. Industry classification is based on the 48 Fama-French industries. Log (Assets) is the logarithm of each firm's book value of assets and Turnover is the ratio of trade volume to total number of shares outstanding. Regressions include target industry*period fixed effects. The standard errors, corrected for clustering of observations at the deal level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Periodic returns

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Period -1	Period 0	Period 1	Period 2	Period -1	Period 0	Period 1	Period 2
Target	0.012**	-0.000	-0.002	-0.006	0.008	0.001	-0.000	-0.002
	(0.0061)	(0.0067)	(0.0066)	(0.0060)	(0.0059)	(0.0068)	(0.0067)	(0.0059)
Target*Distress	0.001	-0.091***	-0.033	0.105***	0.009	-0.082**	-0.014	0.107**
	(0.0240)	(0.0345)	(0.0336)	(0.0400)	(0.0253)	(0.0362)	(0.0340)	(0.0416)
Log (Assets)					-0.001***	-0.002***	-0.002***	-0.000
					(0.0005)	(0.0005)	(0.0004)	(0.0005)
Turnover					-0.000***	-0.000	-0.000***	-0.000***
					(0.0000)	(0.0001)	(0.0001)	(0.0001)
Industry*Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	225,325	224,890	224,438	224,524	153,859	153,496	152,074	151,567
R-squared	0.151	0.153	0.116	0.153	0.159	0.157	0.150	0.163

Panel B. Cumulative Returns (Relative to 4 weeks before the announcement)

	(1) Period 0	(2) Period 1	(3) Period 2	(4) Period 3	(5) Period 0	(6) Period 1	(7) Period 2	(8) Period 3
Target	-0.000	0.027***	0.025*	0.024	0.001	0.025**	0.021	0.017
	(0.0067)	(0.0103)	(0.0142)	(0.0156)	(0.0068)	(0.0105)	(0.0146)	(0.0161)
Target*Distress	-0.091***	-0.117***	-0.050	-0.063	-0.082**	-0.094**	-0.028	-0.026
	(0.0345)	(0.0379)	(0.0452)	(0.0442)	(0.0362)	(0.0399)	(0.0487)	(0.0470)
Log (Assets)					-0.002***	-0.004***	-0.007***	-0.010***
					(0.0005)	(0.0007)	(0.0013)	(0.0013)
Turnover					-0.000	0.000***	0.001***	0.002***
					(0.0001)	(0.0001)	(0.0003)	(0.0004)
Industry*Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	224,890	222,889	221,497	219,779	153,496	151,198	149,832	148,077
R-squared	0.153	0.163	0.182	0.192	0.157	0.167	0.186	0.198

Table 5. Fire Sale Discount: Robustness to Alternative Distress Definition

This table presents the main results using four alternative distress measures. In models (1) and (2), the Distress dummy takes on a value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period prior to the deal announcement date. Models (3) and (4) present results with a Distress dummy that equals one if the median industry annual return centered on the announcement date is less than 30%. In Models (5) and (6), the Distress dummy takes on a value of one if the seller's industries experience a 20% decline in their median return during the six month period centered on the deal announcement date. In Models (7) and (8), the Distress dummy takes on a value of one if both the target and the seller's industries experience a 20% decline in their median return during the six month period centered on the deal announcement date and we use value-weighted least square regression models. The sample contains all the firms in the target's industry, including the target. The dependent variables are the four-week premium for target firms and four-week returns for non-target firms in the same Fama-French industries as the target firm during the four-week period that ends on and includes the announcement day. The four-week deal premium is calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of the target's trade volume to total number of shares outstanding. Regressions include target industry*period fixed effects. The standard errors, corrected for clustering of observations at the deal level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Lag Six Month		Centered Twelve Month		Seller-only Six Month Distress		Value-weighted Six Month Distress	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Target	0.001	0.003	0.001	0.003	0.000	0.002	-0.020	-0.016
	(0.0067)	(0.0069)	(0.0058)	(0.0060)	(0.0067)	(0.0069)	(0.0123)	(0.0123)
Target*Distress	-0.083***	-0.081***	-0.085***	-0.082***	-0.081***	-0.073**	-0.090***	-0.090***
	(0.0293)	(0.0295)	(0.0285)	(0.0300)	(0.0303)	(0.0313)	(0.0291)	(0.0292)
Log (Target Assets)		-0.002***		-0.002***		-0.002***		-0.001**
		(0.0005)		(0.0004)		(0.0005)		(0.0005)
Turnover		-0.000		-0.000		-0.000		0.000
		(0.0001)		(0.0000)		(0.0001)		(0.0001)
Industry*Period FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	224,890	153,496	352,172	200,271	224,903	153,496	223,996	153,403
R-squared	0.153	0.157	0.168	0.167	0.153	0.157	0.396	0.407

Table 6. Firesale Discount: Robustness to Alternative Premium Window

The dependent variables are the 1-day premium for target firms and 1-day returns for non-target firms in the same Fama-French industries as the target firm during the 1-day period that ends on and includes the announcement day. We follow Gormley & Matsa (2014) where the sample includes all the firms in the target's industry, including the target in Models 3 and 4 (see text for details). One-day deal premium is calculated as the (transaction share price at the announcement - share price one day before the announcement)/share price one day before the announcement. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. The sample of deals excludes those where the announcement date is not the same as the completion date. Distress is a binary variable that takes the value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. Industry classification is based on the 48 Fama-French industries. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding; Target Leverage is the target's debt divided by the target's debt plus equity, all in book values; Log (Acquired Stake Sizes) is the logarithm of the size of the acquired stakes. Target Market-to-Book is the target's market value of equity divided by its book value of equity; Target Return on Assets is the target's EBITDA divided by the book value of the target's assets. All the accounting values are as of the most recent annual accounting statement before the deal announcement winsorized at the 1% level. The standard errors, corrected for clustering of observations at the target industry-year level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Industry Unadjusted		Industry Adjusted (Gormley & Matsa (2014))	
Dependent Variables	1-day deal premium		1-day return (deal premium for targets)	
	(1)	(2)	(3)	(4)
Distress	-0.101***	-0.086**		
	(0.0351)	(0.0345)		
Distress*Target			-0.052**	-0.049*
			(0.0261)	(0.0265)
Target			-0.012***	-0.010**
			(0.0041)	(0.0041)
Log (Target Assets)	0.001	-0.002		-0.000
	(0.0023)	(0.0026)		(0.0002)
Turnover	0.000	0.000		0.000
	(0.0003)	(0.0004)		(0.0000)
Log (Acquired Stake Size)	-0.009**	-0.012***		
	(0.0037)	(0.0038)		
Target Leverage		0.010		
		(0.0209)		
Target Market-to-book		-0.004*		
		(0.0022)		
Target Return on Assets		0.008		
		(0.0274)		
Year Fixed Effects	Yes	Yes	No	No
Industry Fixed Effects	Yes	Yes	No	No
Industry*Period FE	No	No	Yes	Yes
Sample	Targets Only	Targets Only	All Firms in Targets' Industry	All Firms in Targets' Industry
Number of Deals	489	489	489	489
Number of Observations	489	489	176,530	120,431
R-squared	0.161	0.169	0.083	0.088

Table 7. Fire Sale Discount: Robustness to Alternative Industry Classification

This table presents the main results for industry regression using 3-digit (models 1 and 2) or 2-digit (models 3 and 4) SIC industry classifications. Industry classification affects the construction of our distressed industry indicator and, naturally, peer firms in the same industry. The sample contains all the firms in the target's industry, including the target. The dependent variable is the four-week deal premium for target firms and four-week returns for non-target firms in the same industries during the four-week period that ends on and includes the announcement day. The four-week deal premium is calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For the deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Distress is a binary variable that takes the value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding. Regressions include target industry*period fixed effects. The standard errors, corrected for clustering of observations at the deal level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	3-digit SIC Industry		2-digit SIC Industry	
	(1)	(2)	(3)	(4)
Target	0.025***	0.025***	-0.008	-0.006
	(0.0071)	(0.0073)	(0.0072)	(0.0073)
Target*Distress	-0.117***	-0.113***	-0.079**	-0.068**
	(0.0295)	(0.0302)	(0.0331)	(0.0341)
Log (Target Assets)		-0.001***		-0.003***
		(0.0004)		(0.0006)
Turnover		-0.000*		-0.000**
		(0.0001)		(0.0001)
Industry*Period FE	Yes	Yes	Yes	Yes
Observations	78,590	69,624	214,328	160,076
R-squared	0.145	0.160	0.157	0.161

Table 8. Fire Sale Discount: Robustness to Alternative Subsamples

This table presents the main results using some subsamples. Modes 1 and 2 contain subsamples of asset sales where the crisis years of 2007 and 2008 are excluded. Models 3 and 4 contain subsamples of asset sales where the seller is an unlisted firm. The dependent variables are the four-week premium for target firms and four-week returns for non-target firms in the same Fama-French industries as the target firm during the four-week period that ends on and includes the announcement day. The four-week deal premium is calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Distress is a binary variable that takes the value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. Industry classification is based on the 48 Fama-French industries. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding. Regressions include target industry*period fixed effects. The standard errors, corrected for clustering of observations at the deal level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Exclude Crisis Years		Unlisted Sellers Only	
	(1)	(2)	(3)	(4)
Target	-0.000	0.003	-0.001	0.002
	(0.0070)	(0.0071)	(0.0086)	(0.0088)
Target*Distress	-0.117***	-0.113***	-0.112**	-0.112**
	(0.0373)	(0.0406)	(0.0450)	(0.0484)
Log (Target Assets)		-0.003***		-0.003***
		(0.0006)		(0.0007)
Turnover		-0.000**		-0.000**
		(0.0001)		(0.0001)
Industry*Period FE	Yes	Yes	Yes	Yes
Observations	194,218	131,700	93,331	87,524
R-squared	0.122	0.130	0.142	0.152

Table 9. Fire Sale Discount and the Size of the Stake Sold

This table presents the main results using two subsamples. Modes 1 and 2 (3 and 4) contain subsamples of asset sales where the stake size is greater than or equal to (less than) ten percent. The dependent variables are the four-week premium for target firms and four-week returns for non-target firms in the same Fama-French industries as the target firm during the four-week period that ends on and includes the announcement day. The four-week deal premium is calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. The premium is trimmed at the upper and lower 2.5% level. For the deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Distress is a binary variable that takes a value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. Industry classification is based on the 48 Fama-French industries. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding. Regressions include target industry*period fixed effects. The standard errors, corrected for clustering of observations at the deal level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Stake Size >= 10		Stake Size < 10	
	(1)	(2)	(3)	(4)
Target	-0.008	-0.008	0.002	0.003
	(0.0172)	(0.0180)	(0.0072)	(0.0073)
Target*Distress	-0.181***	-0.176***	-0.083**	-0.073*
	(0.0246)	(0.0219)	(0.0375)	(0.0396)
Log (Target Assets)		-0.002**		-0.002***
		(0.0011)		(0.0006)
Turnover		-0.000		-0.000
		(0.0001)		(0.0001)
Industry*Period FE	Yes	Yes	Yes	Yes
Observations	37,368	28,893	187,522	124,603
R-squared	0.147	0.158	0.154	0.156

Online Appendix - Table A
Industry Unadjusted Regressions: Robustness to Alternative Industry Classification

This table presents the industry unadjusted OLS results using 3-digit (Models 1 and 2) and 2-digit (Models 3 and 4) SIC industry classifications. Industry classification affects the construction of our distressed industry indicator and, naturally, industry fixed effects. Distress is a binary variable that takes a value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period centered around the deal announcement date. The dependent variable is the four-week deal premium calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding; Log (Acquired Stake Sizes) is the logarithm of the size of the acquired stakes. Target Leverage is the target's debt divided by the target's debt plus equity, all in book values; Target Market-to-Book is the target's market value of equity divided by its book value of equity; Target Return on Assets is the target's EBITDA divided by the book value of the target's assets. All the accounting values are as of the most recent annual accounting statement before the deal announcement and are winsorized at the upper and lower 1% level. The standard errors, corrected for clustering of observations at the target industry-year level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	3-digit SIC Industry		2-digit SIC Industry	
	(1)	(2)	(3)	(4)
Distress	-0.126*	-0.113*	-0.151***	-0.129**
	(0.0642)	(0.0640)	(0.0513)	(0.0510)
Log (Target Assets)	-0.008	-0.016**	-0.008*	-0.017***
	(0.0052)	(0.0068)	(0.0049)	(0.0063)
Turnover	0.000	0.000	0.000	0.000
	(0.0009)	(0.0009)	(0.0009)	(0.0009)
Log (Acquired Stake Size)	-0.009	-0.014**	-0.009	-0.015***
	(0.0069)	(0.0064)	(0.0060)	(0.0054)
Target Leverage		-0.004		0.021
		(0.0393)		(0.0360)
Target Market-to-book		-0.011***		-0.012***
		(0.0043)		(0.0035)
Target Return on Assets		0.022		0.024
		(0.0480)		(0.0461)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	572	572	634	634
R-squared	0.125	0.139	0.131	0.148

Online Appendix - Table B
Industry Unadjusted Regressions: Robustness to Alternative Distress Definition

This table presents the industry unadjusted OLS results using four alternative distress measures. In Models (1) and (2), the Distress dummy takes on a value of one if both the target's and the seller's industries experience a 20% decline in their median return during the six month period prior to the deal announcement date. Models (3) and (4) present results with a Distress dummy that equals one if the median industry annual return centered on the announcement date is less than 30%. In Models (5) and (6), the Distress dummy takes on a value of one if the seller's industries experience a 20% decline in their median return during the six month period centered on the deal announcement date. In Models (7) and (8), the Distress dummy takes on a value of one if both the target and the seller's industries experience a 20% decline in their median return during the six month period centered on the deal announcement date and we use value-weighted least square regression models. The dependent variable is the four-week deal premium calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding; Log (Acquired Stake Sizes) is the logarithm of the size of the acquired stakes. Target Leverage is the target's debt divided by the target's debt plus equity, all in book values; Target Market-to-Book is the target's market value of equity divided by its book value of equity; Target Return on Assets is the target's EBITDA divided by the book value of the target's assets. All the accounting values are as of the most recent annual accounting statement before the deal announcement and are winsorized at the upper and lower 1% level. The standard errors, corrected for clustering of observations at the target industry-year level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Lag Six Month		Centered Twelve Month		Seller-only Six Month Distress		Value-weighted Six Month Distress	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Distress (Alternative)	-0.022	-0.015	-0.289***	-0.261***	-0.199***	-0.175***	-0.229***	-0.231***
	(0.0475)	(0.0481)	(0.0748)	(0.0819)	(0.0500)	(0.0497)	(0.0573)	(0.0511)
Log (Target Assets)	-0.008	-0.018***	-0.012**	-0.019***	-0.008	-0.015**	-0.022**	-0.023**
	(0.0051)	(0.0065)	(0.0052)	(0.0063)	(0.0049)	(0.0062)	(0.0112)	(0.0089)
Turnover	0.000	0.000	0.000	0.000	0.001	0.001	-0.001***	-0.001***
	(0.0009)	(0.0009)	(0.0008)	(0.0008)	(0.0009)	(0.0009)	(0.0002)	(0.0002)
Log (Acquired Stake Size)	-0.007	-0.013**	-0.011*	-0.015**	-0.010*	-0.014***	-0.000	0.001
	(0.0060)	(0.0056)	(0.0062)	(0.0062)	(0.0059)	(0.0053)	(0.0086)	(0.0087)
Target Leverage		0.017		0.030		0.012		-0.008
		(0.0349)		(0.0336)		(0.0356)		(0.0950)
Target Market-to-book		-0.013***		-0.012***		-0.010***		-0.031
		(0.0035)		(0.0045)		(0.0034)		(0.0222)
Target Return on Assets		0.026		0.032		0.023		0.340
		(0.0464)		(0.0495)		(0.0458)		(0.2977)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	638	638	605	605	638	638	638	638
R-squared	0.111	0.133	0.152	0.166	0.146	0.159	0.617	0.622

Online Appendix - Table C
Industry Unadjusted Regressions: Robustness to Alternative Subsamples

This table presents the industry unadjusted OLS results using some subsamples. Modes 1 and 2 contain subsamples of asset sales where the crisis years of 2007 and 2008 are excluded. Models 3 and 4 contain subsamples of asset sales where the seller is an unlisted firm. The dependent variable is the four-week deal premium calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding; Log (Acquired Stake Sizes) is the logarithm of the size of the acquired stakes. Target Leverage is the target's debt divided by the target's debt plus equity, all in book values; Target Market-to-Book is the target's market value of equity divided by its book value of equity; Target Return on Assets is the target's EBITDA divided by the book value of the target's assets. All the accounting values are as of the most recent annual accounting statement before the deal announcement and are winsorized at the upper and lower 1% level. The standard errors, corrected for clustering of observations at the target industry-year level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Exclude Crisis Years		Unlisted Sellers Only	
	(1)	(2)	(3)	(4)
Distress	-0.237***	-0.201***	-0.212***	-0.208***
	(0.0697)	(0.0700)	(0.0702)	(0.0718)
Log (Target Assets)	-0.007	-0.018***	-0.006	-0.014*
	(0.0052)	(0.0062)	(0.0061)	(0.0083)
Turnover	-0.000	0.000	-0.001	-0.001
	(0.0009)	(0.0009)	(0.0010)	(0.0010)
Log (Acquired Stake Size)	-0.008	-0.016***	-0.000	-0.005
	(0.0059)	(0.0054)	(0.0087)	(0.0081)
Target Leverage		0.048		0.030
		(0.0396)		(0.0557)
Target Market-to-book		-0.014***		-0.008
		(0.0033)		(0.0055)
Target Return on Assets		-0.007		
		(0.0476)		(0.0777)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	544	544	373	373
R-squared	0.128	0.157	0.253	0.260

Online Appendix - Table D
Industry Unadjusted Regressions and the Size of the Stakes Sold

This table presents the industry unadjusted OLS results using two subsamples. Modes 1 and 2 (3 and 4) contain subsamples of asset sales where stakes sold is equal to or greater than (less than) ten percent. The dependent variable is the four-week deal premium calculated as the transaction share price at the announcement over the share price four weeks before the announcement, minus one. Premium is trimmed at the upper and lower 2.5% level. For deals where the transaction share price is not directly available, we divide the total deal value by the percentage acquired and the number of shares outstanding to calculate the transaction share prices. Log (Target Assets) is the logarithm of the target's book value of assets; Turnover is the ratio of trade volume to total number of shares outstanding; Log (Acquired Stake Sizes) is the logarithm of the size of the acquired stakes. Target Leverage is the target's debt divided by the target's debt plus equity, all in book values; Target Market-to-Book is the target's market value of equity divided by its book value of equity; Target Return on Assets is the target's EBITDA divided by the book value of the target's assets. All the accounting values are as of the most recent annual accounting statement before the deal announcement and are winsorized at the upper and lower 1% level. The standard errors, corrected for clustering of observations at the target industry-year level, are reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Stake Size>=10		Stake Size<10	
	(1)	(2)	(3)	(4)
Distress	-0.528***	-0.274***	-0.174***	-0.156***
	(0.1024)	(0.0951)	(0.0528)	(0.0492)
Log (Target Assets)	0.031	-0.007	-0.007	-0.014**
	(0.0200)	(0.0212)	(0.0052)	(0.0068)
Turnover	-0.002	-0.001	0.000	0.000
	(0.0021)	(0.0022)	(0.0010)	(0.0010)
Log (Acquired Stake Size)	0.012	0.014	-0.008	-0.013*
	(0.0878)	(0.0811)	(0.0076)	(0.0072)
Target Leverage		0.010		-0.017
		(0.0797)		(0.0392)
Target Market-to-book		-0.039***		-0.011***
		(0.0112)		(0.0039)
Target Return on Assets		0.374***		-0.031
		(0.1078)		(0.0450)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
Observations	122	122	516	516
R-squared	0.398	0.504	0.181	0.199