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Equity Issuance and Adverse Selection: A Direct Test Using Conditional Stock Offers

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ABSTRACT

We conduct a unique test of adverse selection in the equity issuance process. While common stock is the dominant means of payment in bank mergers, stock acquisition agreements provide target shareholders with varying degrees of protection against adverse price movements in the bidder's stock between the time of the merger agreement and the time of merger completion. We show that it is the degree of protection against adverse price changes and not the percent of stock offered in a bank merger that explains bidder merger announcement abnormal returns. This result is difficult to explain outside of an adverse selection framework.

FIRMS ARE OFTEN RELUCTANT to issue equity to fund new investments. A frequently cited rationale for this reluctance is that markets might interpret an equity issue authorized by managers with private information about a firm's value as a signal that the firm's stock is overvalued (Myers and Majluf (1984)). Consistent with this adverse selection scenario, firms generally experience a significant drop in their stock price when they announce that they are selling stock in a secondary offering,¹ and merger announcement returns are lower when bidding firms offer stock, rather than cash, as payment.² There are, however, alternative explanations for why share prices decline when firms issue equity. Firms issuing equity rather than debt may forego the discipline that debt imposes on managers (Jensen (1986)) or lose the potential tax advantages of debt financing. Additionally, firms issuing equity may face a downward sloping demand curve for firm shares (Loderer, Cooney, and Van Drunen (1991)). While these explanations are not mutually exclusive, testing the validity of any one explanation requires controlling for the alternatives.

In this article we conduct a unique test that isolates the impact of adverse selection in the equity issuance process. Our tests focus on the means of payment used in a large sample of bank mergers agreements during the period 1985–1992. Acquiring banks issuing stock to target bank shareholders offer varying degrees of protection to target shareholders against adverse private

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¹ For example, see Asquith and Mullins (1986), Masulis and Korwar (1986), and Korajczyk, Lucas, and McDonald (1991).

² For example, see Travlos (1987) and Brown and Ryngaert (1991).

information concerning the bidder's future share price. Some stock merger agreements provide target shareholders a fixed number of shares when the merger is completed. In these cases, a decline in the bidder's stock price prior to closing reduces target shareholders' compensation. Alternatively, many agreements condition the number of shares issued to target shareholders on the price of the bidder's stock shortly before the merger is completed. We refer to these agreements as conditional stock offers. In its most extreme form, a conditional stock offer provides target shareholders a fixed dollar amount of stock. If the bidder's stock price falls (rises) prior to the completion of the merger, the target receives additional (fewer) shares to maintain the same dollar level of compensation.

Since regulatory delays in banking mergers cause the average time to completion of a proposed merger to exceed seven months, a great deal of the uncertainty (and hence private information) about the value of the bidder and target will be resolved between the time of the initial merger agreement and when the deal is closed. Consequently, a conditional stock offer allows the bidder to offer the target firm stock in the merged entity *and* provide the target some degree of protection from post agreement revelations of adverse changes in the bidder's true value. This is of particular importance in bank mergers, because regulatory factors favor stock as a means of payment.³ Hence, undervalued acquiring banks may view conditional stock offers as a substitute for a cash offer. In fact, such offers are common in bank mergers.

Our sample consists of 209 bank merger announcements where the mode of financing consists of cash, common stock or a combination of the two. For each agreement, we estimate the percentage of target merger compensation that is common stock. We also estimate the elasticity of the target's compensation with respect to the bidder's stock price at the time of each merger agreement. Since conditional stock offers frequently establish "caps" or "floors" on the number of shares to be exchanged, we use option pricing techniques to estimate this elasticity. If adverse selection contributes to share price declines associated with equity issues, then the stock market will respond more favorably when bidders announce a merger agreement where the value of target compensation is less sensitive to changes in the bidder's stock price. Consistent with the adverse selection hypothesis, we find that after controlling for other factors that are likely to influence the market's response to an acquisition, *including the percentage of stock in the offer*, abnormal returns to bidders are greater when target compensation has a lower elasticity with respect to the bidder's stock price. Furthermore, when we control for the protection an offer provides against adverse selection, the percentage of stock used to finance an acquisition has no incremental effect on the bidder's abnormal return.

By focusing on conditional stock offers, our article provides a novel test of the importance of private information and adverse selection in the method of payment choice. Past empirical work has examined whether the price reac-

³ Factors that favor stock include capital requirements, long merger delays that make bidders unable to close a deal quickly with cash, and taxation of capital gains in cash offers.

tions of bidding firms differ for cash versus stock offers. The decision to use cash or stock, however, depends on factors besides private information. In contrast, whether a firm issues stock through a fixed exchange ratio offer or a conditional offer has little or no effect on firm free cash flow, firm capital structure, the supply of firm stock, or the tax treatment of the offer. Thus, it is difficult to explain our results outside of a private information framework.

While our evidence suggests that stock offers can be constructed to minimize the adverse selection concerns of target firms, fixed exchange ratio stock offers are still the most popular form of stock acquisition mechanism, despite the lemons problems they may create. Our final empirical tests address this issue. Relying on models that account for the fact that both the bidder and target may face adverse selection in a merger agreement (Hansen (1987), Eckbo, Giammarino, and Heinkel (1990), and Fishman (1989)), we argue that there are potential costs to the bidder that may arise from guaranteeing the target a fixed dollar compensation. We present evidence consistent with these models.

The article proceeds as follows. Section I discusses adverse selection and the means of payment. It includes how we estimate the elasticity of the target's compensation with respect to the bidder's stock price. Section II describes our sample. Section III presents descriptive statistics and Section IV presents regression results relating bidder abnormal returns to the degree of protection provided to target shareholders. Section V examines the factors that influence the extent to which targets are protected against the private information of the bidder. Section VI concludes.

I. Adverse Selection and the Method of Payment in an Acquisition

The compensation received by bidder and target shareholders in a merger depends on the underlying value of the combined firm and the terms of the merger agreement. The underlying equity value of the combined firm (V) is the sum of three components: the stand alone equity value of the target (V_t), the stand alone equity value of the bidder (V_b), and any synergies that can be created by combining the two firms (S).

Assume that the bidder has private information about its own stand alone value (V_b). Adverse selection problems arise when the bidder offers the target compensation that could decrease in value if the bidder's stand alone value falls. The bidder can lessen adverse selection concerns by bearing more of the risk associated with shifts in its stand alone value. The terms of the merger agreement determine the allocation of this risk. The theoretical literature in finance (e.g., Hansen (1987) and Eckbo, Giammarino, and Heinkel, (1990)) has generally viewed this relative risk bearing as a cash versus stock proposition, in which "high" value bidders bear more risk by offering more cash and "low" value bidders bear less risk by offering more stock.

Consider an example where the target receives some present value amount of cash, C , along with a fixed percentage, α , of the combined firm. The value of

this offer to the target, TCOMP, and the value of the merger to the bidder, BCOMP, and the value of the combined firm, V are:

$$\text{TCOMP} = C + \alpha(Vt + Vb + S - C) \quad (1)$$

$$\text{BCOMP} = (1 - \alpha)(Vt + Vb + S - C) \quad (2)$$

$$V = Vt + Vb + S = \text{TCOMP} + \text{BCOMP}. \quad (3)$$

Holding TCOMP and BCOMP constant, larger values of α and lower values of C shift the risk associated with changes in underlying firm value from the bidder to the target. In fact, one measure of the relative risk being borne by the target is the percentage of total compensation paid to the target that is common stock:

$$\text{PCTSTK} = \frac{\alpha(V - C)}{C + \alpha(V - C)} \quad (4)$$

In this article, we are interested in a more general characterization of relative risk bearing that can be applied to any offer. We employ the percentage revaluation of the target's compensation with respect to the percentage revaluation of the bidder's compensation that is induced by a change in the stand alone value of the bidder, Vb . This elasticity, ELAST1, is defined as:

$$\text{ELAST1} = \frac{\partial \text{TCOMP} / \partial Vb}{\partial \text{BCOMP} / \partial Vb} \times \frac{\text{BCOMP}}{\text{TCOMP}}. \quad (5)$$

Presumably, bidding firms that are confident of their underlying value would be willing to assume greater exposure to shifts in Vb and provide the target with less exposure, resulting in a lower level of ELAST1. In the case where the number of shares in the offer is fixed:

$$\text{ELAST1} = \frac{\alpha(V - C)}{C + \alpha(V - C)}. \quad (6)$$

Note that in this case, ELAST1 equals the percentage of total dollar compensation in the offer that is common stock. Hence, a straight stock for stock exchange where the exchange ratio is predetermined will have an elasticity of one. For an all cash offer, the elasticity is zero.

For conditional stock offers where the number of shares issued is a decreasing function of bidder share price (and underlying firm value), the elasticity measure, ELAST1, prior to the merger's completion will be less than the percent of compensation that is attributable to stock. For a conditional stock offer where the target is guaranteed a certain dollar amount of stock, the elasticity measure equals zero. Conditional stock offers of this sort have the same protection as cash, provided that all of the bidder's private information at the time of the merger agreement is released prior to closing. However, this

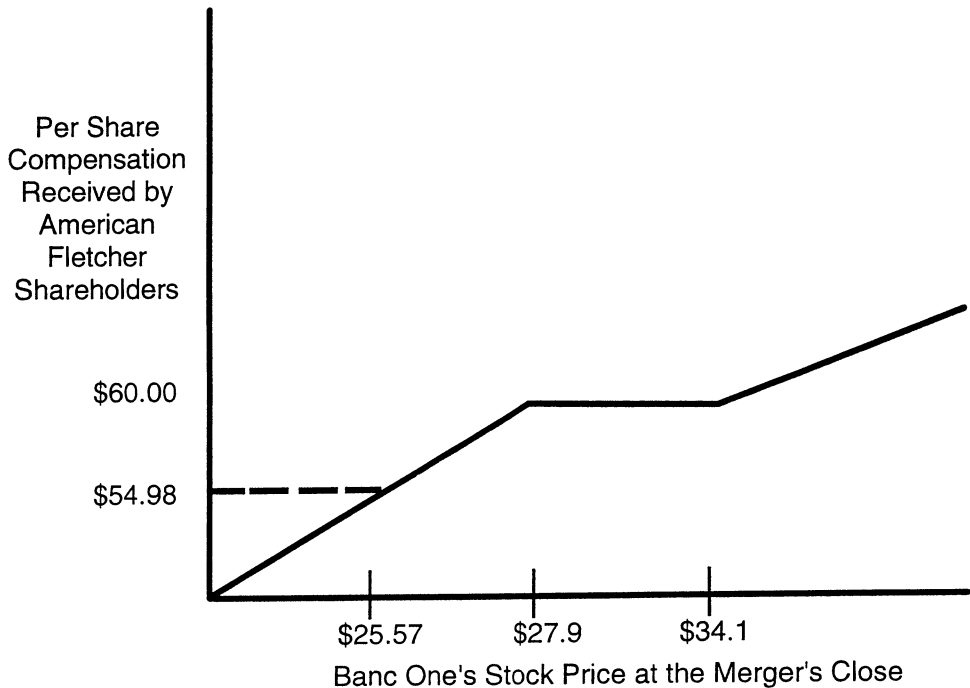


Figure 1. Compensation schedule for American Fletcher shareholders. This figure plots the per share compensation received by American Fletcher shareholders in their 1986 merger with Banc One Corporation, as a function of Banc One's stock price on the day the merger is completed.

type of offer is rare. For the vast majority of conditional stock offers, the initial merger agreement places restrictions on the number of shares to be issued.

In these instances, the value of target compensation, TCOMP, can be expressed as a long stock position in the joint company coupled with options, written and/or held with differing exercise prices, on the joint company's stock. The process by which we estimate ELAST1 can be demonstrated with a merger agreement from our sample.

In January 1986, Banc One entered into an acquisition agreement with American Fletcher. The agreement stipulated that Banc One would exchange a certain number of its common shares for each share of American Fletcher stock. The number of shares depended on the average Banc One share price, P , for a ten-day period ending six days before the merger closing. The exchange formula is given below:

Number of Shares Exchanged	Price (P) Range for Banc One Stock
2.15 shares	if $P < \$27.9$
$60/(\text{Banc One Share Price})$	if $\$27.9 < P < \34.1
1.76 shares	if $P > \$34.1$

Figure 1 plots American Fletcher's compensation, TCOMP, as a function of Banc One's share price. If Banc One's price at closing had been between \$27.9

and \$34.1 a share, American Fletcher shareholders would have received \$60 worth of Banc One stock for every share exchanged. If, however, Banc One's price went outside of this range, American Fletcher shareholders would have received a fixed number of shares, and their compensation would have been sensitive to any additional changes in Banc One's stock price.

The payoff plotted in Figure 1 is analogous to the payoff that an investor would receive from a strategy of: purchasing 2.15 shares of Banc One stock, writing 2.15 call options on Banc One stock (each with a strike price of \$27.90) and purchasing 1.76 call options on Banc One stock (each with a strike price of \$34.10). Of course, the price of Banc One stock will be based on the combined firm's underlying value. Consequently, the value of this package must be reexpressed as a long position in the combined firm's value, along with a short and long call option on the combined firm's value.⁴

To estimate the value of this compensation to American Fletcher shareholders, TCOMP, we use the Black-Scholes option pricing model. We use the six month T-bill rate as the risk free interest rate, and the time between the agreement date and eleven days before the merger actually closed as the time until expiration.⁵ To estimate the volatility of the combined firm, we calculate the variance of the bidder and target's weekly continuously compounded stock returns, as well as the correlation of their weekly stock returns. These estimates are based on stock market returns over the interval 230 to 31 days before the first news story indicating that the target was a takeover candidate. The weights used to calculate the variance of the combined firm are based on the market values of the bidder and target five days before the first news story that the target was a takeover candidate.

Recalling that TCOMP is a long position in the combined firm's value, V , along with long and short call options written on V , we cannot solve for TCOMP without knowledge of V . Since TCOMP is a function of V and $V = \text{TCOMP} + \text{BCOMP}$, we solve for TCOMP and V by fixing the value of BCOMP. To estimate BCOMP we use the bidder's stock market value two days before the merger announcement date less the estimated present value of dividends to be paid between the merger agreement and merger closing. This assumes that all synergies from the merger go to the target.

Finally, we calculate the change in the value of the target's compensation with respect to changes in the value of the stand alone bidder, $\partial \text{TCOMP} / \partial V_b$,

⁴ Details of this calculation are available upon request.

⁵ Eleven days before closing is the midpoint of the ten-day period during which the price of Banc One stock was averaged for the purposes of the merger agreement. For all agreements, we use the actual time between the merger agreement and the midpoint of the price determination period as the time to expiration with two exceptions. For merger accords where the time to expiration exceeded one year, we cap the time to expiration at one year. For cases where the merger was never completed, we use the average time to expiration of other conditional stock offers in our sample.

again using option pricing techniques.⁶ Plugging this and our estimates of BCOMP and TCOMP into equation (6), we calculate ELAST1 to be 0.627 for the Banc One/American Fletcher merger.

A complicating factor in the elasticity estimation is that many merger agreements have an additional clause that allows one or both parties to call off the merger if the price of the stock goes above or below some threshold value. For instance, in the American Fletcher merger agreement, there was a clause that allowed the American Fletcher board to call off the deal if the price of Banc One's stock fell below \$25.57 per share. However, unlike the other terms of the conversion formula, the contract did not require a new conversion ratio in the event the price fell below \$25.57. Our ELAST1 estimate assumes that any violation of this price threshold will be ignored. In fact, in this case, Banc One stock did fall below \$25.57, and American Fletcher proceeded with the previously agreed upon exchange ratio.

Nevertheless, such terms can protect target shareholders against a collapse in bidder share price, and occasionally terms are renegotiated based on violations of these thresholds. So, we calculate a second elasticity estimate under the assumption that American Fletcher shareholders would be "made whole" if the Banc One stock dropped below \$25.57. This assumes that they will get shares of Banc One worth \$54.98 (2.15 shares at \$25.57 a share). In this situation, bidders are providing target shareholders additional put options with a strike price equal to \$25.57. This additional downside protection is represented by the dashed lines in Figure 1. Including this "put protection" into the American Fletcher package, we get a new second definition of elasticity (ELAST2) with a value of 0.421. Arguably, for most deals, the "true" elasticity lies somewhere between ELAST1 and ELAST2, but using both measures allows us to check the robustness of our results.⁷

Three additional points are worth making. First, all conditional stock offers are not alike. While the type of offer outlined above is the most common, other types provide a dollar compensation floor and/or cap to the target. Second, some fixed exchange ratio stock offers also provide the target with back-out provisions that allow ELAST2 to be less than one. Third, bidders, as well as targets, occasionally have back-out options. For instance, in some fixed exchange ratio offers there are price ceilings that, if violated, give the bidder an option to back out. Furthermore, some offers that provide the target with more shares if the bidder's price falls allow the bidder to back out if it believes that its stock has been depressed too significantly and the number of shares to be issued is too high. In calculating ELAST2, we assume that the party with the back-out option can use it to their advantage. For instance, if a target was

⁶ Since $dV/dV_b = 1$, the quantity $\partial \text{TCOMP} / \partial V_b = \partial \text{TCOMP} / \partial V$. For the option components of the target compensation, the changes in value due to changes in V_b (V) fall out of the "hedge ratio" of these options.

⁷ ELAST2 is likely to be biased downward for cases with a back-out clause because the target may not seek renegotiation if the price decline of the bidder was market related. In fact, a number of agreements with renegotiation clauses render the clauses inapplicable if the bidder's share price decline was accompanied by a large percentage decline in other bank stocks.

guaranteed \$20 of stock, but the bidder could call off the transaction if its price fell below \$20 per share, we assume that the target's compensation falls dollar for dollar as the bidder's price falls below \$20 at closing. Given this possibility, we have four offers where ELAST2 actually exceeds ELAST1.

Furthermore, virtually all merger agreements allow either party to back out in the event of a material adverse change in either firm before the merger closes. In this sense, targets and bidders are protected against major events that adversely affect their merger partner. Thus, conditional stock offers might be viewed as protecting target shareholders against contingencies that are not easily classified as materially adverse.

Finally, all merger agreements stipulate that the target firm shareholders must approve the agreement. If, for instance, a decline in the bidder's share price significantly reduces the target's compensation, target shareholders can reject the merger. The ability of shareholders to reject the initial merger terms if they become "unfair" will tend to operate like a material adverse change clause. This possibility may blur the distinction between a conditional and fixed exchange ratio stock offer if mergers are terminated routinely and/or renegotiated because of changes in available information.

Two factors limit this possibility. First, in most agreements, target management agrees to use its best efforts to get shareholder approval. In a few cases, targets face a financial penalty if the deal is not approved. Second, a merger may be beneficial to the target even at a lower value than originally anticipated. Shareholder rejection in hope of more favorable terms assumes that the process of bid revision is costless and certain. Rejected bids are not always renegotiated. Furthermore, if shareholder rejections of initial merger agreements due to changes in available information were likely, then no differences would exist in how the market reacts to the means of payment and in what determines the means of payment. We demonstrate later that this is not the case.

II. Data and Empirical Design

A. Description of Sample

We collect a sample of initial bank merger agreements announced from 1985 through 1992 from three primary sources: a keyword search on Dow Jones News Retrieval, the bank mergers and acquisitions section of the Wall Street Journal (WSJ) Abstracts Index, and the mergers and acquisitions section in the New York Times (NYT) Abstracts Index. To insure full data availability, target firms must have at least 100 million dollars of assets and stock return data on the Center for Research in Security Prices (CRSP) tapes. To keep a relatively homogeneous set of bidders, we exclude bidders that are thrift institutions and restrict our analysis to friendly acquisitions.⁸ We eliminate mergers that have to wait more than two years before they can be legally

⁸ This eliminates institutions that are holding companies for savings banks and thrifts.

consummated, because a disproportionate number of such mergers are never completed. We also exclude “mergers of equals” from the sample because it is unclear which firm is the bidder. We define a merger of equals as a merger in which either the assets or the equity value of the smaller firm would constitute more than 45 percent of the combined assets or equity value of the two firms *and* the new board of directors will be composed of equal numbers of directors from each firm. We also eliminate one case where the acquirer simultaneously announced a stock issue of greater value than the acquisition itself.

For each remaining merger agreement, we try to obtain a copy of the initial merger agreement from 8K and proxy filings describing the merger terms. In many cases, we cannot get a full copy of the merger agreement. In these cases, we rely on descriptions of the deals reported in news stories or other SEC filings. Remaining agreements are only used if there are sufficient details about the merger’s terms, the compensation is entirely common stock and/or cash (including cash equivalents like nonconvertible debt and preferred stock), and it is possible to estimate elasticity measures. Consequently, we exclude another twelve agreements because the compensation includes convertible stock, warrants, or payoffs that are pegged to the bidder’s book value (rather than stock price).

The final sample consists of 209 offers. The sample contains 29 offers where no common stock is offered. These consist of 26 cash offers, one debt offer, one straight preferred offer, and one combination cash and straight preferred offer. There are 94 fixed exchange ratio stock offers, 60 conditional stock offers, 17 offers where the target received a combination of cash and common stock with conditional terms, and 9 offers where the target received a combination of cash and common stock with a fixed exchange rate. The breakdown of merger types indicates that the use of cash in bank mergers is rare compared to industrial mergers.⁹ Regulatory and tax considerations may explain why there are fewer cash offers in banking, and why there is a need for close informational substitutes such as conditional stock offers.¹⁰

Of our 209 merger agreements, 151 were definitive agreements and 58 were preliminary agreements. There is more latitude to back out of or alter the terms of a preliminary agreement, although in our sample, the majority of preliminary proposals are adopted as definitive merger terms. Additionally, 184 of the merger agreements lead to an actual merger and 25 agreements are terminated.

⁹ For example, Brown and Ryngaert (1991) find that cash is the means of payment in roughly 60 percent of industrial mergers in their sample between 1981 and 1986. A review of *Mergers & Acquisition* magazine shows that for the period 1987–1992, the ratio of cash offers to stock offers was about 5 to 1.

¹⁰ Cash offers generally reduce the capital ratio of bidding banks, and subject target shareholders to capital gains taxes when the merger is completed.

B. Empirical Methodology

To properly calculate the abnormal returns associated with each merger agreement we must capture any "information leakage" prior to the merger announcement. For each bidder and target we identify two dates: the agreement date and the leakage date. The agreement date for the bidder and target is the date of the initial agreement reported in the WSJ or NYT or the day after the first Dow Jones Newswire story if the merger agreement is not reported in the WSJ or NYT. The leakage date for the target is the first announcement that the target was a takeover candidate. We find this date by searching the Dow Jones News Wire, NYT index, and WSJ Index for the three months prior to the agreement date to identify any news story indicating that the company put itself up for sale, was in merger talks, or received a takeover proposal. If we find a story, we go back an additional three months to see if there is another prior story. The leakage date for the bidder is the first date that the bidder reveals that it is in talks with the target or offers to acquire the target. Note that the bidder's leakage date is never before the target's leakage date. Also, if there are no identifiable news leaks, the leakage date is the agreement date.

We use event study methodology to estimate abnormal returns for the bidder and target. Using continuously compounded firm and CRSP equally-weighted market returns, market model parameters are estimated over day -230 to day -31 , where day 0 is the leakage date. One concern when calculating the abnormal returns for bidding firms is that their stock market performance prior to the acquisition is likely to be correlated with their choice of financing and elasticity offer. If, for example, bidding firms delay making high elasticity stock offers until share price-increasing good news about the firm is released, then we would expect to see positive intercepts (alphas) in our market model estimates for these firms. This may result in a downward bias in the abnormal returns for firms making high elasticity stock offers.¹¹ To correct for this potential bias, we replace alpha with the daily estimated return to risk-free investment multiplied by 1 minus the estimated beta from the market model. This is essentially a one factor return model with the daily abnormal return for firm i on day t , AR_{it} , equal to

$$AR_{it} = R_{it} - (1 - \beta_i)R_{ft} - \beta_i R_{mt} \quad (7)$$

where R_{ft} is the continuously compounded return to firm i on day t , β_i is the estimated market model beta for firm i , R_{ft} is the daily risk free return proxied for by the continuously compounded annual yield on a 6-month Treasury bill at the time of the merger agreement divided by the average number of trading days in a year, and R_{mt} is the continuously compounded equally-weighted CRSP market return on day t .¹²

¹¹ We thank the editor for raising this potential bias issue. The fact that firms may experience a price run-up before an equity issue is discussed in Lucas and McDonald (1990).

¹² Although we use this particular abnormal return measure throughout the article, all the basic results in our study continue to hold when we use an abnormal return generated under the

The overall abnormal bidder and target returns are calculated by summing up the abnormal returns for four days before the leakage date through one day after the agreement date. We refer to these returns as BID6 and TAR6, since the window will be 6 days long if there is no information leakage. Similarly, we estimate abnormal returns from one day before the leakage date through one day after the agreement date and refer to these abnormal returns as BID3 and TAR3, since the windows will be 3 days long if there is no information leakage.

If adverse selection concerns are meaningful, we expect bidder abnormal returns to be negatively related to the elasticity measures, even when controlling for the percent stock in an offer. We also need to control for other factors that might influence bidder returns. If acquisitions tend to be value-reducing for bidders, then larger acquisitions might lead to larger price declines. So, we take the ratio of the target's stock market value five days before its leakage date to the bidder's stock market value five days before its leakage date to estimate the variable *RELATIVE SIZE*. Larger values of *RELATIVE SIZE* are expected to negatively influence bidder returns.¹³

The degree of observable competition for a target's shares has had a significant negative impact on the shares of successful bidders in industrial acquisitions (see Bradley, Desai, and Kim (1988)). We would expect the same for bank mergers. If the press accounts at the time of the merger agreement or in the 100 trading days prior to the announcement indicate that the target had received a bid from another entity or that another bank had sought permission to acquire more than 20 percent of the bidder's shares, then we assign that observation a value of one for a dummy variable called *COMPETE* and zero otherwise. In our regression analysis we interact *COMPETE* with *RELATIVE SIZE* based on the premise that larger highly competitive acquisitions will lead to a larger decline in the bidder's announcement window returns.

We also expect higher bidder returns from acquisitions that generate greater cost savings. Mergers that are "in-market" present greater opportunities to reduce costs by closing overlapping branch offices and redundant headquarter facilities. To capture the potential for cost savings, we create a variable called *OVERLAP*. We identify each subsidiary of the target and bidding bank, including whenever possible deals that either bank may have pending. Using the Rand McNally and Thomson Bank Directory, we identify how many branches each firm has in a given city. Let n be the total number of cities that either bank has offices in, let T_i denote the total number of offices the target has in

assumption of a standard market model with an estimated intercept (α) representing a benchmark return.

¹³ In a study of industrial mergers, Asquith, Bruner, and Mullins (1983) find a positive relation between bidder merger returns and the relative size of the target to the bidder. Their sample, however, is made up of cases where the bidder's return from the merger was positive. Houston and Ryngaert (1994) document a negative link between bidder return and relative size for bank mergers.

city i and let B_i denote the total number of offices the bidder has in city i . OVERLAP is defined as:

$$\text{OVERLAP} = \frac{\sum_{i=1}^n \min(T_i, B_i)}{\sum_{i=1}^n B_i}. \quad (8)$$

OVERLAP can be viewed as the maximum level of overlapping offices that could be closed as a result of the merger relative to the current scale of the bidder's operations. Higher levels of OVERLAP are expected to result in higher bidder returns.

The relative performance of the bidder is also likely to affect the bidder's returns. One measure of the bidder's performance, which has been found to be significant in explaining abnormal returns in industrial mergers is Tobin's Q .¹⁴ Higher bidder Q s lead to higher bidder returns. Arguably, the extent to which the bidder's Q matters depends on the size of the acquisition. Therefore, we interact RELATIVE SIZE with a dummy variable which equals 1 if the bidder's market to book ratio of total assets exceeds the median market to book ratio for publicly traded banks on the 1993 COMPUSTAT Industrial and Research Tapes in the year prior to the acquisition announcement. If high performance bidders realize better returns on larger acquisitions, we would expect a positive coefficient on this interacted variable.¹⁵

III. Descriptive Statistics

Table I provides descriptive statistics for the entire sample. We find that the announcement of a merger agreement results in the bidding firm realizing an average negative 2.3 percent abnormal return for the shorter window (BID3) and negative 2.4 percent for the longer window (BID6). By contrast target firms realize large positive abnormal returns. These results are consistent with other recent studies of bank mergers.¹⁶

Table I also shows that the large majority of acquisitions are financed with stock. The percentage of compensation coming from stock averages 81.9 percent. The elasticity of target compensation measures range from 0 to 1, and have an average level of 0.649 and 0.595 for ELAST1 and ELAST2, respectively. These numbers can be interpreted as follows: for the average acquisition, the target's compensation rises (falls) 0.649 percent when the bidder's stock price increases (decreases) by 1 percent. This calculation assumes that clauses that enable a deal to be canceled if the bidder's stock price crosses a certain level are not binding. If these clauses are assumed to lead to renegot-

¹⁴ See, for instance, Servaes (1991) and Lang, Stulz, and Walkling (1989). We thank an anonymous referee for suggesting that we include a measure of the bidder Q .

¹⁵ We also consider, at the referee's suggestion, whether bidder abnormal returns might be explained by the percentage of stock held by the firm's officers and directors. The estimated coefficient on this measure (while controlling for the other variables) is routinely insignificant and including it in our regressions does not affect the nature or significance of any of the other results.

¹⁶ See, for instance, Houston and Ryngaert (1994) and Neely (1987).

Table I
Descriptive Statistics for 209 Bank Merger Agreements During the
Period 1985–1992

BID6 is the bidder abnormal return from four days before to one day after merger announcement, BID3 is the bidder abnormal return from one day before to one day after merger announcement, TAR6 is the target abnormal return from four days before the first merger news to one day after merger announcement, TAR3 is the target abnormal return from one day before the first merger news till one day after merger announcement. ELAST1 is the elasticity of the target's compensation with respect to the bidder's compensation assuming no renegotiation of merger terms if the bidder's price crosses a specified threshold, ELAST2 is the elasticity of the target's compensation with respect to the bidder's compensation assuming renegotiation of merger terms if the bidder's price crosses a specified threshold. PCTSTOCK is the percent of the target's merger compensation that is received as common stock, RELATIVE SIZE is the premerger market value of the target's equity divided by the market value of the bidder's equity, OVERLAP is the number of overlapping bidder and target branches divided by bidder branches, HIGH Q DUMMY is a dummy variable equal to one if the bidder has a market to book asset ratio greater than the median COMPUSTAT banking firm, and COMPETE is a dummy variable that equals 1 if the bidder faced observable competition in acquiring the target.

	Mean	Median	Maximum	Minimum
BID6	-0.024	-0.018	0.183	-0.328
BID3	-0.023	-0.015	0.142	-0.256
TAR6	0.204	0.197	0.858	-0.539
TAR3	0.177	0.174	0.687	-0.538
ELAST1	0.649	0.815	1	0
ELAST2	0.595	0.675	1	0
PCTSTOCK	0.819	1	1	0
RELATIVE SIZE	0.171	0.102	0.836	0.003
OVERLAP	0.037	0.008	0.559	0
HIGH Q DUMMY	0.689	1	1	0
COMPETE	0.086	0	1	0

tiated terms (as described earlier), the target's compensation rises (falls) 0.595 percent for a 1 percent increase (decrease) in the bidder's stock price.

For the average merger agreement, the pre-announcement value of the target represents just over 17 percent of the bidder's value. Target operations overlap, on average, in 3.7 percent of the locations where the bidder operates. For 68.9 percent of the acquisitions, the bidder has an above median *Q* ratio. In 8.6 percent of the acquisitions, there were published press reports that an identifiable firm had made a competing bid for the target.

Table II divides the sample by the method of payment: cash, stock, or a combination of the two. For each type of financing, the mean six-day bidder weighted abnormal return is reported. The observations are weighted by the inverse of the standard errors from the estimated market models. The evidence suggests that the method of payment influences the bidder's abnormal return in a manner consistent with the adverse selection hypothesis. Bidders offering cash have less negative abnormal returns than those offering stock, and bidders that make conditional stock offers do better, on average, than bidders that offer a fixed number of shares.

Table II
Mean Statistics for Selected Variables Grouped by the Mode of Acquisition for a Sample of 209 Bank Merger Agreements Among Publicly Traded Firms, for the Period 1985-1992

BID6 is the bidder abnormal return from four days before to one day after merger announcement, BID3 is the bidder abnormal return from one day before to one day after merger announcement. Percent Common Stock is the percent of the target's merger compensation that is received as common stock. ELAST1 is the elasticity of the target's compensation with respect to the bidder's compensation assuming no renegotiation of merger terms if the bidder's price crosses a specified threshold. ELAST2 is the elasticity of the target's compensation with respect to the bidder's compensation assuming renegotiation of merger terms if the bidder's price crosses a specified threshold. RELATIVE SIZE is the premerger market value of the target's equity divided by the market value of the bidder's equity, and the number of trading days between merger agreement and closing of merger is only calculated for completed mergers. The Fixed Ratio Stock mode is used when the target receives a fixed number of the bidder's shares, and the Conditional Stock mode is used when the number of bidder shares the target receives is a function of the bidder's shares price.

Mode of Acquisition	No. of Observations	WLS Mean		Percent Common Stock	ELAST		RELATIVE SIZE	Mean	Mean Trading Days Between Agreement and Closing
		6-Day Return to Bidder: (BID6)	3-Day Return to Bidder: (BID3)		ELAST1	ELAST2			
Fixed ratio stock	94	-0.034	-0.033	1	1	0.938	0.234		154.8
Conditional stock	60	-0.013	-0.011	1	0.536	0.455	0.133		170.0
Fixed exchange ratio stock and cash	9	-0.023	-0.037	0.698	0.698	0.662	0.209		200.9
Conditional stock and cash	17	-0.002	-0.007	0.636	0.184	0.177	0.052		188.4
Cash, debt, and straight preferred	29	-0.008	-0.006	0	0	0	0.102		194.4

Table II also illustrates the different levels of elasticity of target compensation for each offer type. In particular note that ELAST1 averages only 0.536 for pure conditional stock offers. Though not reported in the table, it is worth noting that there is considerable variation in these elasticities involving conditional stock offers. For the all conditional stock offer group, ELAST1 ranges from a minimum of zero to a maximum of 0.883. Interestingly, bidder returns appear to roughly correspond with the level of elasticity. Also notice that ELAST2 is only slightly less than ELAST1 for all categories of stock offers.

Table II reports two additional statistics of interest. First, we report the number of trading days between initial merger agreement and merger completion. The means are similar (and statistically indistinguishable at conventional significance levels) for conditional and fixed exchange ratio stock offers. More importantly, the 170 trading day interval for conditional stock offers leaves adequate time for uncertainty about the bidder's private information to be resolved before the merger's completion.¹⁷ The results in Table II also indicate that the average relative size for conditional stock offers is similar to that found in cash offers, and considerably less than that found for fixed exchange ratio stock offers. The evidence on returns and size of acquisition suggests that conditional stock offers are used in circumstances similar to those of cash offers. These descriptive statistics also suggest that it is misleading to lump together conditional and fixed exchange ratio stock offers in analyzing the mode of acquisition.

IV. Bidder Abnormal Returns and Adverse Selection

Tables I and II indicate that the average bidder realizes a negative abnormal return upon the announcement of an acquisition. However, there is considerable variation in the abnormal returns across the sample. Table III presents evidence relating bidder abnormal returns to the degree of protection the target receives against changes in the bidder's share price, as well as other factors that influence bidder abnormal returns. In Table III, ELAST1 is used as the measure of target sensitivity to changes in the bidder's share price. Table IV presents similar evidence using ELAST2.

To the extent the adverse selection hypothesis is correct, bidders with lower levels of ELAST1 and ELAST2, send a better signal to the capital markets, and therefore should realize, *ceteris paribus*, higher abnormal returns. When an elasticity measure is included with the percent of the offer that is stock, the coefficient on elasticity should continue to be negative and significant, with percent stock adding little explanatory power. In fact, if all relevant private information that the bidder has about the offer is revealed prior to the closing of the merger, then the percentage stock offered should have no explanatory power that is attributable to the private information revealed by the offer.

¹⁷ Actually, the time for private information releases is slightly shorter because the price used to determine shares issued is generally an average of prices 5 to 25 trading days before merger completion.

Table III

Regressions Relating the Bidder's Abnormal Return to the Mode of Acquisition and Other Characteristics of the Merger

Sample consists of all 209 bank merger agreements during the period 1985–1992. BID6 is the bidder abnormal return from four days before to one day after merger announcement. BID3 is the bidder abnormal return from one day before to one day after merger announcement. ELAST1 is the elasticity of the target's compensation with respect to the bidder's compensation assuming no renegotiation of merger terms if the bidder's price crosses a specified threshold. PCTSTOCK is the percent of the target's merger compensation that is received as common stock. RELATIVE SIZE is the premerger market value of the target's equity divided by the market value of the bidder's equity. OVERLAP is the number of overlapping bidder and target branches divided by bidder branches. RELATIVE SIZE* COMPETE is the relative size variable times a dummy variable that equals 1 if the bidder faced observable competition in acquiring the target, and RELATIVE SIZE*HIGH Q DUMMY the relative size variable times a dummy variable equal to one if the bidder has a market to book asset ratio greater than the median COMPUSTAT banking firm. The regressions are weighted by the inverse of the standard errors of the abnormal return estimates, and *t*-statistics are in parentheses.

Dependent Variable	BID6	BID6	BID6	BID3	BID3	BID3
INTERCEPT	-0.004 (-0.54)	0.002 (0.30)	-0.000 (-0.02)	-0.003 (-0.54)	0.000 (0.09)	-0.000 (-0.04)
ELAST1	-0.037 (-3.45)	-0.028 (-3.76)		-0.032 (-3.29)	-0.025 (-3.78)	
PCTSTOCK	0.013 (1.15)		-0.015 (-1.84)	0.009 (0.91)		-0.015 (-2.02)
RELATIVE SIZE	-0.095 (-3.29)	-0.098 (-3.40)	-0.117 (-4.01)	-0.078 (-2.95)	-0.080 (-3.05)	-0.096 (-3.66)
OVERLAP	0.091 (2.36)	0.087 (2.28)	0.082 (2.09)	0.071 (2.05)	0.069 (1.99)	0.064 (1.80)
RELATIVE SIZE* COMPLETE	-0.113 (-2.18)	-0.110 (-2.11)	-0.106 (-1.99)	-0.125 (-2.62)	-0.122 (-2.56)	-0.119 (-2.42)
RELATIVE SIZE* HIGH Q DUMMY	0.072 (2.49)	0.074 (2.58)	0.074 (2.51)	0.052 (2.01)	0.054 (2.08)	0.055 (2.05)
ADJUSTED R ²	0.178	0.176	0.134	0.186	0.187	0.147

The evidence in Tables III and IV strongly supports the adverse selection hypothesis. When elasticity is the only means of payment variable included in the cross-sectional regression of abnormal returns, there is a strong and statistically negative coefficient on each measure of elasticity. This result holds regardless of the length of the window used (3-day or 6-day) to calculate bidder abnormal returns. The point estimates suggest that bidder returns are more than three percent higher for offers providing targets full protection (elasticity equals 0), compared to offers with no protection (elasticity equal to 1).

Moreover, the results in Tables III and IV suggest that it is elasticity, not the percentage of stock, that influences abnormal returns. When both variables are included in the regression, the elasticity coefficient continues to be negative and significant, while the percent stock coefficient is positive but insignificant at the 10 percent level. When the only means of payment variable

Table IV

Regressions Relating the Bidder's Abnormal Return to the Mode of Acquisition and Other Characteristics of the Merger Using an Alternative Elasticity Measure

Weighted least squares (WLS) regressions relating the abnormal return of the bidding banks from a sample of 209 publicly traded mergers, 1985–1992, to the mode of acquisition and other characteristics of the merger. BID6 is the bidder abnormal return from four days before to one day after merger announcement. BID3 is the bidder abnormal return from one day before to one day after merger announcement. ELAST2 is the elasticity of the target's compensation with respect to the bidder's compensation assuming renegotiation of merger terms if the bidder's price crosses a specified threshold. PCTSTOCK is the percent of the target's merger compensation that is received as common stock. RELATIVE SIZE is the premerger market value of the target's equity divided by the market value of the bidder's equity. OVERLAP is the number of overlapping bidder and target branches divided by bidder branches. RELATIVE SIZE* COMPETE is the relative size variable times a dummy variable that equals 1 if the bidder faced observable competition in acquiring the target, and RELATIVE SIZE* HIGH Q DUMMY the relative size variable times a dummy variable equal to one if the bidder has a market-to-book asset ratio greater than the median COMPUSTAT banking firm. The regressions are weighted by the inverse of the standard errors of the abnormal return estimates, and *t*-statistics are in parentheses.

Dependent Variable	BID6	BID6	BID3	BID3
INTERCEPT	−0.004 (−0.53)	0.000 (0.09)	−0.004 (−0.55)	0.000 (0.06)
ELAST2	−0.035 (−3.24)	−0.029 (−3.65)	−0.032 (−3.27)	−0.027 (−3.80)
PCTSTOCK	0.009 (0.85)		0.007 (0.74)	
RELATIVE SIZE	−0.092 (−3.12)	−0.095 (−3.24)	−0.074 (−2.76)	−0.076 (−2.86)
OVERLAP	0.092 (2.38)	0.089 (2.32)	0.073 (2.09)	0.071 (2.04)
RELATIVE SIZE*	−0.118	−0.114	−0.129	−0.126
COMPETE	(−2.26)	(−2.20)	(−2.69)	(−2.64)
RELATIVE SIZE*	0.070	0.072	0.051	0.053
HIGH Q DUMMY	(2.43)	(2.51)	(1.95)	(2.03)
ADJUSTED R ²	0.172	0.173	0.186	0.188

included in the regressions is percent stock offered, the coefficient on percent stock is negative and significant at the 10 percent level for the six day return regression and at the 5 percent level for the three day return regression. This evidence indicates that there is considerable variability in the information content of stock offers.¹⁸

¹⁸ Arguably, the information content of a conditional stock offer also depends on how long it takes to complete the deal. If the deal is completed in a short period of time, a conditional stock offer will have an information content similar to that of a fixed exchange stock offer, whereas if the deal takes a long time to complete, its information content is more similar to that of a cash offer. To consider this effect, we create a new variable, TIMEINT, which is calculated as a weighted average of ELAST1 and PCTSTOCK. The weight is the number of trading days it takes to complete the deal divided by 127 (the number of trading days in a six-month period). If a deal took more than six months to complete, we assume that all of the bidder's private information was revealed, and

Other estimates in Tables III and IV deserve mention. First, there is a negative relationship between bidder abnormal returns and *RELATIVE SIZE*. This result suggests that bidders suffer more when they make larger acquisitions. Bidders that face competition in acquiring the target also realize lower abnormal returns proportional to *RELATIVE SIZE*. Also, consistent with Houston and Ryngaert (1994) the positive coefficient on *OVERLAP* suggests that bidders do better the greater the amount of overlap between the markets in which they and the target operate. Finally, we find a positive and significant coefficient on the variable which interacts *RELATIVE SIZE* with a dummy variable indicating whether the bidder's *Q* exceeds the industry median for the year prior to the acquisition. This indicates that better performing banks realize higher abnormal returns when they make an acquisition.

The results in Tables III and IV are remarkably similar, suggesting that the results are robust with respect to the elasticity measure used. It appears that the option to back out of a deal if the bidder's stock price goes beyond a certain threshold does not materially affect the signal provided by the mode of acquisition. This probably reflects the fact that the majority of these options are exercisable only if there is a considerable change in the bidder's share price after the announcement of the acquisition.

Table V reports similar estimates for the subset of deals in which there was a definitive agreement, and for the subset of deals that were ultimately completed. Arguably, agreements that are preliminary in nature are not binding contracts. In fact, stock offers that are preliminary might be viewed as "conditional" offers in the sense that any decline in bidder stock value might lead to a renegotiation of terms before a definitive agreement is made. Similarly, the set of deals that are ultimately completed might be viewed as deals that the participants were more firmly committed to at their inception. The results in Table V, however, are similar to our previous estimates for the whole sample. The elasticity variable is again negative, significant, and roughly of the same magnitude as documented in Table III, while the percent stock variable has little explanatory power. Consequently, including canceled deals and nondefinitive deals in our sample does not appear to alter our conclusions.

As a final robustness check, Table VI presents regressions that restrict the analysis to offers that are exclusively stock. This eliminates any special influence that cash offers might have on the sample. Again, we find a strong negative relationship between bidder abnormal returns and the measures of elasticity. This result reinforces our previous results and highlights the uniqueness of our tests. Whether a firm issues stock through a fixed exchange ratio offer (with elasticity equal to 1) or a conditional offer (with an elasticity less than 1), has little or no effect on firm free cash flow, firm capital structure,

in these instances we set the weight equal to one, which sets *TIMEINT* equal to *ELAST1*. The results are qualitatively similar using *TIMEINT*, as opposed to *ELAST1* as the explanatory variable. One drawback of using *TIMEINT* is that it somewhat arbitrarily assumes that all private information is revealed in six months (although we do obtain similar results using alternative benchmark periods). A second drawback is that it forces us to throw out deals that were not completed.

Table V

Regressions Relating the Abnormal Return of Bidding Banks to the Mode of Acquisition and Other Characteristics of the Merger for Subsamples with Mergers with Definitive Agreements and Mergers that were Completed

Subsamples come from full sample of 209 bank merger agreements during the period 1985–1992. BID6 is the bidder abnormal return from four days before to one day after merger announcement. ELAST1 is the elasticity of the target's compensation with respect to the bidder's compensation assuming no renegotiation of merger terms if the bidder's price crosses a specified threshold. PCTSTOCK is the percent of the target's merger compensation that is received as common stock. RELATIVE SIZE is the premerger market value of the target's equity divided by the market value of the bidder's equity. OVERLAP is the number of overlapping bidder and target branches divided by bidder branches. RELATIVE SIZE* COMPETE is the relative size variable times a dummy variable that equals 1 if the bidder faced observable competition in acquiring the target, and RELATIVE SIZE* HIGH Q DUMMY the relative size variable times a dummy variable equal to one if the bidder has a market to book asset ratio greater than the median COMPUSTAT banking firm. The regressions are weighted by the inverse of the standard errors of the abnormal return estimates, and *t*-statistics are in parentheses.

Sample	Mergers With Definitive Agreement (N = 151)	Mergers With Definitive Agreement (N = 151)	Completed Mergers (N = 184)	Completed Mergers (N = 184)
Dependent Variable	BID6	BID6	BID6	BID6
INTERCEPT	−0.010 (−1.10)	−0.007 (−0.95)	−0.004 (−0.58)	0.003 (0.56)
ELAST1	−0.036 (−2.25)	−0.029 (−3.05)	−0.039 (−3.41)	−0.027 (−3.38)
PCTSTOCK	0.010 (0.57)		0.018 (1.48)	
RELATIVE SIZE	−0.090 (−2.75)	−0.092 (−2.81)	−0.102 (−3.40)	−0.106 (−3.51)
OVERLAP	0.120 (2.67)	0.118 (2.65)	0.081 (2.09)	0.078 (2.00)
RELATIVE SIZE*	−0.104 (−1.84)	−0.102 (−1.80)	−0.230 (−3.66)	−0.224 (−3.57)
COMPETE				
RELATIVE SIZE*	0.080 (2.48)	0.081 (2.52)	0.075 (2.52)	0.078 (2.58)
HIGH Q DUMMY				
ADJUSTED R ²	0.172	0.219	0.214	0.169

the supply of firm stock, or the tax treatment of the company. Thus, a more positive share price response to lower elasticity conditional stock offers is difficult to explain outside of a private information framework.

V. Factors Affecting the Degree of Protection Provided to Targets

The above results suggest that if a bidding bank offers target shareholders a fixed number of shares rather than making a low elasticity conditional stock offer, target firms will assume that the bidder's stock is overvalued and attach a lower value to the offer. Nevertheless, stock offers with fixed exchange ratios

Table VI

**Regressions Relating Bidder Abnormal Returns to the Elasticity of
Target Compensation and Other Merger Characteristics for a
Subsample of 154 Merger Deals Entirely Financed with Common
Stock During the Period 1985–1992**

BID6 is the bidder abnormal return from four days before to one day after merger announcement. BID3 is the bidder abnormal return from one day before to one day after merger announcement. ELAST1 is the elasticity of the target's compensation with respect to the bidder's compensation assuming no renegotiation of merger terms if the bidder's price crosses a specified threshold. RELATIVE SIZE is the premerger market value of the target's equity divided by the market value of the bidder's equity. OVERLAP is the number of overlapping bidder and target branches divided by the bidder branches. RELATIVE SIZE* COMPETE is the relative size variable times a dummy variable that equals 1 if the bidder faced observable competition in acquiring the target, and RELATIVE SIZE* HIGH Q DUMMY the relative size variable times a dummy variable equal to one if the bidder has a market to book asset ratio greater than the median COMPUSTAT banking firm. The regressions are weighted by the inverse of the standard errors from the estimated abnormal returns, and the *t*-statistics are in parentheses.

Dependent Variable	BID6	BID3
INTERCEPT	0.006 (0.61)	0.006 (0.64)
ELAST1	-0.034 (-2.93)	-0.031 (-2.81)
RELATIVE SIZE	-0.103 (-3.29)	-0.094 (-3.23)
OVERLAP	0.115 (2.67)	0.100 (2.50)
RELATIVE SIZE* COMPETE	-0.118 (-2.16)	-0.131 (-2.54)
RELATIVE SIZE* HIGH Q DUMMY	0.085 (2.77)	0.068 (2.38)
ADJUSTED R ²	0.205	0.206

frequently are observed in bank merger offers, despite the lemons problems that can arise from such offers. This result therefore raises an interesting question: What determines the degree of protection that bidders provide target shareholders?

To address this question, we appeal to a model developed by Hansen (1987). Hansen shows how the medium of exchange is structured to reduce the costs of adverse selection when *both* the bidder and the target have private information. Cash offers resolve the lemons problem concerning the bidder's value, while stock offers reduce the lemons problem concerning the target's value. Hansen's model predicts that cash offers are more likely when the market value of the target is small relative to the bidder.

Hansen does not consider conditional stock offers. However, if most of the bidder's private information becomes public before the completion of the merger, conditional stock offers allow a bidder to avoid issuing undervalued

shares in a fashion similar to cash offers. Thus, we predict that low elasticity offers (conditional stock offers and cash offers) are more likely when the target's market value is smaller relative to the bidder's market value—suggesting a positive relationship between elasticity and *RELATIVE SIZE*.

We believe that two other factors can explain the choice of offer elasticity. The greater the correlation of premerger stock returns, the more likely it is that the bidder will employ a high elasticity offer for two reasons. First, it is less likely that the bidder can mislead the target with respect to its private information. Large positive correlation in returns suggests that the bidder and target are affected by similar economic forces. Second, if stand alone bidder and target values tend to move together, then setting a fixed common stock exchange ratio (a high elasticity offer) makes more sense because it is more likely that the terms of the merger will remain "fair" to both parties at the time the deal closes. For instance, if a bidding bank establishes a fixed dollar acquisition price and then the stock prices of banks collapse (boom), the bidding firm (target firm) would have an incentive to find some means to back out of the deal. This kind of ex-post contractual squabbling can be avoided by setting the terms initially in a way that will diminish the probability that the terms will eventually become "unfair" in the eyes of either party. We measure the correlation of bidder and target stock returns using weekly stock returns in the period 230 to 31 trading days before the target was first "put in play."

There is also reason to believe that competition for the target might be important in determining the elasticity of the offer made. For instance, Fishman (1989) argues that in more competitive bidding environments, bidders will make offers that are less contingent on the value of the merged firm. Furthermore, bidders may wish to put forth a firm price for a company in a bidding contest so that the value of their offer does not fluctuate with their share price.

We formally test whether relative size, stock return correlation, and competition can explain the choice of elasticity of target compensation. One concern is that the dependent variables, *ELAST1* and *ELAST2*, are constrained to be between 0 and 1. Ordinary least squares (OLS) estimates, while instructive, may be biased. To address this concern, we present double-sided Tobit estimates that constrain the dependent variable to be between 0 and 1.¹⁹

The first set of results in Table VII are estimates for all 209 agreements in our sample. Consistent with Hansen (1987), statistically significant coefficients on the relative size and correlation variables indicate that higher elasticity offers are more likely when the target is large and the correlation of bidder and target stock returns is high. This holds true regardless of the elasticity measure employed. While the coefficient on the competition dummy

¹⁹ LIMDEP was used to generate the double-sided Tobit results. See Greene (1993) for a description of the problems that arise when dependent variables are either censored or truncated. In all cases the double-sided Tobit results are qualitatively similar to the unreported OLS estimates.

Table VII
Double Sided Tobit Estimates of the Elasticity of Target's Compensation

Double-sided Tobit estimates the elasticity of the target's compensation for the entire sample of 209 bank merger agreements and a subsample of 154 all common stock offers during the period 1985–1992. *RELATIVE SIZE* is the premerger market value of the target's equity divided by the market value of the bidder's equity. *CORRELATION* is the correlation of the bidder and targets weekly stock returns over a 200 day window preceding the first news story indicating that the target was a takeover candidate, and *COMPETE* is a dummy variable that equals 1 if the bidder faced observable competition in acquiring the target. *t*-statistics in parentheses.

Sample	Entire Sample (N = 209)	Entire Sample (N = 209)	Common Stock Only	Common Stock Only
Dependent Variable	ELAST1	ELAST2	ELAST1	ELAST2
INTERCEPT	0.443 (4.18)	0.370 (5.25)	0.895 (10.12)	0.701 (12.37)
RELATIVE SIZE	1.901 (3.84)	1.408 (4.59)	0.935 (2.64)	0.792 (3.62)
CORRELATION	0.992 (2.63)	0.489 (2.02)	0.627 (2.14)	0.241 (1.30)
COMPETE	-0.399 (-1.62)	-0.322 (-1.99)	-0.333 (-1.70)	-0.303 (-2.34)
Log Likelihood	-199.12	-190.81	-106.30	-99.12

is of the correct sign, its significance is dependent on the elasticity measure used.

Table VII also presents results for the subset of firms where the method of payment is all stock. This is a better test of whether the choice of offer elasticity is dependent on private information concerns, because offers with cash in them may be driven, in part, by capital structure and tax concerns. The results are strikingly similar and again consistent with private information models of the means of payment. For the specification using *ELAST1*, the relative size and correlation coefficients are significant, while for the specification using *ELAST2*, the relative size and compete coefficients are significant.

VI. Conclusion

This article examines how stock offers can be structured to mitigate adverse selection problems in bank mergers. In particular, we discuss how a bidder can provide a target with protection against price deterioration in the bidder's stock price between the time a merger is announced and the time it is completed. We show that bidders receive higher merger announcement returns when greater levels of protection are built into a merger offer. In fact, we show that it is not the percentage of stock offered in a merger that conveys private information about the bidder's value, but rather how sensitive the target's compensation is to changes in the bidder's stock price during the time it takes

to complete the merger. We also demonstrate that the decision on how sensitive to make the target's compensation to bidder stock price changes is driven by factors that are largely consistent with adverse selection models of the method of payment. While our analysis has focused on one type of equity issuance in a single industry, our tests enable us to more completely isolate the effects of adverse selection. Consequently, our results provide support to earlier studies that have attributed declining firm value at the announcement of equity issuances to adverse selection.

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