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Abstract. This paper studies the pricing of assets and core deposits of insolvent banks that are sold under the *purchase and assumption* resolution method of the Federal Deposit Insurance Corporation (FDIC). We analyze 620 acquisitions of solvent and insolvent U.S. banks between 2007:Q1 and 2016:Q3 and find that acquirers pay higher prices for insolvent banks with more branches. Our findings hence show that the premium paid by acquirers is not only embedded in failed banks' core deposits but also in the size of their branch networks. Moreover, the core deposits of failed banks are better valued by more capitalized bidders. We also compare the financial strength of acquirers of failed banks with that of acquirers of healthy banks in non-assisted takeovers. The results show that the acquirers in the FDIC-assisted acquisitions are less efficient and have higher non-performing loans than the acquirers in non-assisted acquisitions.

JEL Classifications: G21, G28

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1. Introduction

In the U.S., the Federal Deposit Insurance Corporation (FDIC) resolves failed (insolvent) federally insured depository institutions by selling their assets and deposits to healthy financial institutions – which are known as *assuming institutions* – under a *purchase and assumption* (P&A) transaction. The primary objectives of the FDIC are to provide immediate liquidity to the insured depositors of failed banks and to minimize the expected losses to the deposit insurance fund.

The sale of a failed bank is conducted in the form of an auction: Eligible acquirers are invited by the FDIC to attend the auction and to bid for the failed bank. The bidders are supposed to offer two bids: a discount for purchasing the assets, and a premium for assuming the deposits. In some cases, the FDIC commits to bear a proportion of future losses on certain assets under a loss-share agreement. The FDIC assesses the bids and chooses the one that is the least costly to the deposit insurance fund (Resolutions Handbook 2014, pp. 2, 5). Assets and deposits of the insolvent bank are then transferred to the winning bidder. The resolution process is fast and takes place within a few days,[2] with only a few weeks of prior planning by the FDIC staff.

The key question is whether, in such a short period, the FDIC sells assets and deposits of failed banks at a fair price and to the right acquirers. Most previous studies show that the assuming institutions' share prices experience positive abnormal returns (James and Wier, 1987; Bertin, Ghazanfari, and Torabzadeh, 1989; Cochran, Rose, and Fraser, 1995; Zhang, 1997; Loveland, 2012; Vij 2020),[3] which implies that the assets and deposits of failed banks are underpriced.

[2] Typically, the insolvent bank is closed on a Friday afternoon, then reopened as a branch of the acquiring bank on a Monday morning.

[3] James and Wier (1987), using a sample of nineteen P&A auctions for the 1973-1983 period, find positive abnormal returns for the acquirers and claim that winning bidders in P&A deals pay less than the true value of the failed

In this paper, we contribute to this literature by examining the driving factors of failed banks' auction prices for those banks' assets and core deposits. A better understanding of such factors is important to enable the FDIC to possibly improve the process of selling failed banks.

We model acquisition prices as a function of characteristics of auctioned banks such as core deposits, number of branches, loan quality, inefficiency, liquid assets, noninterest income, and market share. We follow the auction theory literature (Giliberto and Varaiya 1989, among others) and consider the independent private values framework in our model, by including indicators of the financial strength and efficiency of the winning bidders. Indeed, if the acquiring bank is financially weaker or less efficient, it is less likely to exploit its new assets and core deposit base appropriately, and as a result such acquirers tend to offer a lower price. Granja, Matvos, and Seru (2017) study the allocation of failed banks and find that thinly capitalized potential acquirers have less ability to acquire failed banks and this distorts the allocation of failed banks towards the acquirers that may have a lower willingness to pay.

We use data on 234 acquisitions (arranged by the FDIC) of insolvent banks and 386 acquisitions of solvent banks that took place between 2007:Q1 and 2016:Q3. The acquisition price in the insolvent bank deals is the premium that is paid to assume the deposits, minus: a) the discount that the acquirer receives for purchasing troubled assets; and b) the expected value of

banks. Bertin, Ghazanfari, and Torabzadeh (1989) study 33 P&A deals during the 1982-1987 period and report positive cumulative abnormal returns for winning bidders and argue that their bids are, on average, less than the value of failed banks. Cochran et al. (1995) examine 58 P&A auctions during the 1982-1991 period and find that P&A acquirers experienced positive abnormal returns, especially when both acquirers and the failed banks are large; the acquirers of small failed banks have not earned a positive significant excess return. Zhang (1997) studies 128 FDIC-assisted acquisitions and 387 non-assisted acquisitions and reports that the repeated assisted acquirers have gained positive abnormal returns, while first-time acquirers have not exhibited positive excess returns. Finally, Loveland (2012) analyzes 225 P&A transactions during 1985-2010 and finds positive abnormal returns for the winning bidders. He finds that failed banks' auctions take place when the banking industry is in distress and in lack of liquidity which causes failed banks to be sold at a discount (fire-sale hypothesis). The information asymmetry hypothesis may also explain the underpricing of failed banks. In contrast, Pettway and Trifts (1985) report a negative average geometric abnormal return for a sample of eleven P&A transactions that occurred from 1975 through 1981. They conclude that acquirers overbid for failed banks.

the FDIC's commitment, if any, to share some of the future losses under a loss-share agreement. Our sample of failed bank acquisitions shows that acquirers pay on average a 0.35% premium to assume failed banks' core deposits and receive on average a 13.68% discount for purchasing the assets of failed banks. The value of a loss-share agreement is on average 2.93% of failed banks' total assets.

We first study the franchise value[4] that is embedded in the core deposits and in the number of branches of insolvent banks that are sold under the P&A resolution method. After controlling for target bank loan quality, inefficiency, noninterest income, market share, and time effects, we find that the assets of failed banks with more branches are sold, on average, at a higher price, which suggests that there is a premium that acquirers pay so as to benefit from broader geographic coverage. In our preferred specification, a one percent increase in the number of branches is associated with a 2.16% increase in the price of the assets of failed banks. Such results suggest that the franchise value of a failed bank is embedded in its core deposits and also in its branch network. Our findings hence highlight a premium for geographic expansion – as is captured by branching.

Next, given that optimal bidding in certain auctions depends on the characteristics of the bidder, we explore whether financial weakness or inefficiency of the acquirers can also affect acquisition prices. The acquisition of a failing bank provides an opportunity for financially constrained banks to expand their operation without the start-up costs of establishing new branches, and attracting new depositors. Granja et al. (2017) argue that the ability of an acquirer

[4] Franchise value is an intangible asset and is, in general, difficult to accurately measure. However, a key component of the franchise value of banks is associated with bank-client relationship (see Demsetz, Saidenberg, and Strahan 1996; Ergungor 2005; Liang, Ching, and Chan 2013; Santikian 2014; among others). Bank-client relationships can be represented by branch networks and core deposits. Branches are the selling points where banks interact with their clients. The literature shows that banks establish branches, even abroad, to maintain the relationships with their clients (Williams 2002) and core deposits are a source of stable funds that are built up gradually over time.

to pay for a failed bank depends on its capitalization. However, we find that capitalization matters only for the assumption of deposits and not for the purchase of assets. Acquirers with a higher capitalization tend to pay a higher premium for the core deposits of failed banks.

Our analysis also shows that acquirers with more employees pay lower premiums for the core deposits of failed banks. This relationship could be spurious, because in less competitive auctions, acquisition prices and the efficiency of acquirers are both expected to be low. To address this concern, we control for the number of bidders in the auctions that are organized by the FDIC. The negative link between the number of an acquirer's employees and the auctioned price of core deposits persists, suggesting that the FDIC might prefer to allocate failed banks to acquirers with more officers to better serve depositors of failed banks. In addition, the price increases with the number of bidders, which is in line with the prediction of the auction theory put forward by Wilson (1977) and Kagel and Levin (1986).

We contribute to the literature on the resolution of failed banks by showing that the pricing of acquired banks in the FDIC-assisted auctions is fundamentally different from the pricing of target banks in non-assisted acquisitions. For instance, the pricing in the former, contrary to the latter, does not show a significant sensitivity to loan quality indicators. We provide some suggestive evidence that this might be due to the loss-share agreements that are signed by the FDIC and the winning bidders.

This article also complements the study of Giliberto and Varayia (1989) and Granja et al. (2017) by showing that the assets and the core deposits of the failed banks are valued by the bidders based on different factors, and that the bidding for core deposits of failed banks can be better explained within the independent private values framework, given that we find that the core deposits of failed banks are better valued by more capitalized bidders. For the asset side, our

results indicate that bidders tend to pay a higher price for failed banks with more branches and liquid assets.

Since the results show that there is a link between inefficiency and capitalization of acquirers and acquisition prices, we examine the financial strength and efficiency of acquirers of failed banks. Acquirers of failed banks are expected to be financially strong, and must meet certain criteria to be eligible for bidding. They must be well capitalized, possess an acceptable CAMELS[5] rating, and have a satisfactory compliance record (Granja et al. 2017). Nevertheless, Igan, Lambert, Wagner, and Zhang (2017) show that bidding banks that engage in lobbying activities have a higher probability of winning the auctions that are organized by the FDIC, which casts doubt on strict adherence to the criteria for selecting eligible acquirers. In this study, we also seek to extend this literature by assessing the financial strength and efficiency of acquirers of failed banks by comparing their strength with that of the acquirers of healthy banks in non-assisted takeovers.

The results show that the acquirers in the FDIC-assisted acquisitions are less efficient and have higher non-performing loans than do the acquirers in non-assisted acquisitions. Nevertheless, the former are larger relative to their targets, exhibit a better CAMELS score, and have a similar capitalization. Interestingly, they are much older and rely more on non-interest income than do the acquirers of healthy banks. The gap between the acquirers of healthy and failed banks persists even when we limit the acquirers of failed banks to those in more competitive auctions.

Lastly, we examine the financial strength of the acquirers that absorb multiple failed banks to explore why they win the auctions repeatedly. We find that – compare to the banks that

[5] This is a supervisory rating system for assessing a bank's financial condition. It consists of Capital adequacy, Asset quality, Management, Earnings, Liquidity, and Sensitivity.

acquire one failed bank – they do not have significantly different capital ratios, but they purchase and assume smaller failed banks.

The paper is organized as follows: Section 2 presents the data and summary statistics. Section 3 examines how the franchise value that is embedded in core deposits is affected by the failure resolution mechanism and the role that is played by the financial strength and efficiency of acquirers. Section 4 provides further investigations: It compares the financial strength and efficiency of acquirers of failed banks vis-à-vis acquirers of healthy banks, and explores the relationship between the financial strength of acquirers and the probability to engage in multiple takeovers. Section 5 concludes.

2. Data and Summary Statistics

2.1. Data

We use a sample of 620 observations on acquisitions of U.S. commercial banks during 2007:Q1-2016:Q3. The sample consists of 234 FDIC-assisted acquisitions[6] – wherein failed banks were sold by the FDIC under the P&A resolution method – and 386 non-assisted takeovers.[7] We collected the data on the FDIC-assisted transactions from the FDIC website. We obtained the data on non-assisted acquisitions from the SNL database. The financial data of the

[6] We initially collected 523 FDIC-assisted transactions from the FDIC website; but because we use the SNL database to retrieve financial data some deals had to be omitted. Specifically, SNL identification numbers of 61 targets and 165 acquirers are missing, which reduced our sample size to 297 deals. We merged this database with the financial data of commercial banks and bank holding companies (BHCs). However, 6 targets could not be matched. We deleted 8 banks from our sample, because their financial data were missing. In addition, since we study the deals where acquirers purchase all of the assets and assume all of the deposits of failed banks (a "whole-bank" transaction), we excluded 49 observations on non-whole-bank P&A deals. Hence, in our final sample, there are 234 transactions.

[7] We also collected the data on 2,077 non-assisted acquisitions from the SNL database. We excluded 16 thrift mergers from the sample. SNL identification numbers of 7 targets and 125 acquirers are missing; in addition for 625 deals acquisition percentages and/or deal values are missing. We also excluded 63 deals where the acquisition was less than 100% of equity capital. Our sample size is hence reduced to 1,241 acquisitions. Next, we merged the data with the database on financial data of commercial banks and BHCs, where 131 targets are not matched and hence excluded from the sample. This leads to 1,110 observations, out of which for 724 targets financial data are missing. Therefore, the final sample consists of 386 transactions.

banks in our sample have been retrieved from the SNL database. The sample of the FDIC-assisted transactions are restricted to the deals where acquirers purchase all assets and assume all deposits of failed banks (a "whole-bank" P&A deal).[8] We also limit the sample of non-assisted acquisitions to the deals where acquirers purchase 100% of equity capital.

We also construct a database at the acquirer level: We identify the 187 acquirers of failed banks and the 192 acquirers of healthy banks in our dataset.[9] We clean the samples from outliers, by winsorizing one percent of each tail. Table I describes the variables that we use in this study.

[TABLE I]

2.2. Summary Statistics

Table II presents the summary statistics of our sample of observations on non-assisted and FDIC-assisted deals over the 2007:Q1-2016:Q3 period. Panel A presents the descriptive statistics for 234 targets that were acquired through the FDIC-assisted acquisitions and 386 targets of non-assisted deals. The data show adequate variations in both samples. The banks that were acquired through the FDIC-assisted deals have, on average, similar *Size*, number of branches (*Number Branch)*, and *Market Share* as do the banks that were acquired though non-assisted transactions. Targets of non-assisted deals have, on average, a higher share of core deposits in total liabilities, but they have lower non-performing loans, other real estate owned,

[8] The bidders can bid for a proportion of assets and deposits of failed banks. The price of such bids depends on the assets and deposits that are excluded from the transaction. Since the price of such deals is not comparable with the price of whole-bank transactions, we exclude them from our sample. This exclusion criterion does not jeopardize heterogeneity in our final sample.

[9] Since some institutions acquired more than one target, we need to collapse the data at the acquirer and quarter levels before merging those data with the financial database. This reduces the sample of the FDIC-assisted and non-assisted acquisitions from 234 to 205 and from 387 to 383 observations, respectively. Then, we merge our dataset with the financial data; however, 36 observations (6 observations on FDIC-assisted acquisitions, and 30 on non-assisted takeovers) are not matched. This leads to 199 and 353 observations on FDIC-assisted and non-assisted deals, respectively. Furthermore, for 12 acquirers of FDIC-assisted targets and for 161 acquirers in non-assisted takeovers, financial data are missing. Hence, our final sample of acquirers consists of 187 acquirers in FDIC-assisted deals and 192 acquirers in non-assisted transactions.

commercial mortgages and inefficiency than do failed banks that were sold in the FDIC-assisted deals. The *Equity Asset Ratio* is 1.24% for the banks that were acquired through FDIC-assisted deals, whereas the ratio is about 11% for the targets of non-assisted acquisitions. The targets of non-assisted acquisitions have a higher liquid assets ratio and a higher non-interest income ratio, and they are older on average than are failed banks.

The ratio of the acquisition price to total assets (*Price Asset Ratio*) is, on average, 14.25% for non-assisted deals, while the ratio is -14.9% for the FDIC-assisted transactions. The figures on the FDIC-assisted deals show that the acquirers pay a 0.35% premium for assuming the failed banks' deposits (*Deposit Premium*); they receive, on average, a 13.68% discount on the purchase of the failed banks' (nominal) assets (*Asset Discount*), and the value of a loss-share agreement is on average 2.93% of the total assets of a failed bank (*Loss Share Value*). On average, nearly 3 bidders attended the auctions that were organized by the FDIC. The number of bidders in such auctions ranged between 1 to 8. The figures on *Same County* show that in 10% of acquisitions of healthy targets and 9% of acquisitions of failed targets, both the acquirer and the target were located in the same county.

Panel B reports the descriptive statistics of the acquirers of failed and healthy banks. Acquirers are classified into two groups: commercial banks, and BHCs. All failed banks are acquired by commercial banks, whereas in our sample healthy targets are acquired by 32 commercial banks, and the acquirers in the remaining transactions are 160 BHCs.[10]

The first part of Panel B illustrates the summary statistics of the commercial banks that acquired failed and healthy banks, respectively. The data show that the acquirers of failed banks (*Failed Banks Acquirers*) were, on average, larger in both absolute and relative terms than the

[10] Many of the commercial banks in our sample belong to BHCs. Nonetheless, we distinguish the acquirers that are commercial banks from BHCs to be able to compare the financial strength of acquirers in assisted acquisition vis-à-vis non-assisted acquisitions.

acquirers of healthy banks (*Healthy Banks Acquirers*). *Acquirer Relative Size* for the acquisition of failed banks indicates that acquirers were on average 12 times larger than the failed banks that they acquired. This variable ranges between 0.23 and 157.[11] *Failed Banks Acquirers* also had more branches (*Acquirer Branch*) than did *Healthy Banks Acquirers*. There is little difference between the two groups of banks in terms of *Tier 1 Ratio*, *Inefficiency,*[12] *Core Deposits*, and *Net Interest Margin*.

The panel also presents the decomposition of *Acquirer Inefficiency*: 1) the ratio of the acquirer's salaries and benefits to total operating revenue (*Acquirer Labor Cost*); and 2) the ratio of the acquirer's occupancy and equipment expenses and other non-interest expenses to total operating revenue (*Acquirer Other Expenses*). Interestingly, *Healthy Banks Acquirers* have a higher *Acquirer Labor Cost* than do *Failed Banks Acquirers*, whereas *Acquirer Other Expenses* is not significantly different between the two groups of acquirers. *Healthy Banks Acquirers* have, on average, a lower ratio of the number of full-time employees to total operating revenue (*Acquirer Employees*) than do *Failed Banks Acquirers*; however, the former pay significantly higher salaries and benefits to their employees (*Acquirer Wage*) than do the latter. *Failed Banks Acquirers* have a lower *CAMELS Score* but a higher *Non-Performing Loans* than do *Healthy Banks Acquirers.*

Failed Banks Acquirers have, on average, a higher *Non-Interest Income* and are much older than are *Healthy Banks Acquirers.* The number of takeovers (*Acquisition Number*) by

[11] The minimum value of *Acquirer Relative Size* is related to three acquisitions: The acquisitions of Cooperative Bank, Southern Community Bank, and USA Bank by First Bank, United Community Bank, and New Century Bank, respectively. The acquisitions took place in June 2009 for the first two deals and in July 2010 for the last deal. However, Granja et al. (2017) state that the FDIC sets a threshold for size that depends on geographic proximity. The bidder's size must be twice of that of the failed bank if they are located in the same state. The bidders from other states must be even larger: four times larger if they are located in contiguous states, and five times otherwise.

[12] "Inefficiency" is the traditional label that is given to the ratio of non-interest expense to total revenue. It clearly derives from an era when banks' functions were perceived as primarily making loans and gathering deposits. As we suggest below, to the extent that banks also earn income from fee-based activities that require additional personnel and other resources, the identification of this ratio with "inefficiency" is weakened.

Healthy Banks Acquirers is on average 1.44 and ranges between 1 and 3. The figure on *Acquisition Quarter* shows that there is no commercial bank that acquires more than one healthy target in a given quarter. However, the average *Acquisition Number* for *Failed Banks Acquirers* is 2.79 and lies between 1 and 12. Moreover, the average number of acquisitions by *Failed Banks Acquirers* in a given quarter is 1.14, and it ranges between 1 and 6.

The second part of Panel B presents the summary statistics of the 160 BHCs that acquired healthy targets. As expected, they are much larger, have more branches, and have a higher *Non-Interest Income* than do the commercial banks that acquired failed or healthy targets. The *Tier 1 Ratio* of the BHCs is on average 13.94 %, which is slightly lower than that of the commercial banks in the first part of the panel.[13] In our sample, BHCs have a higher *Non-performing Loans* relative to the commercial banks that acquire healthy targets; yet it is still far below that of the commercial banks that take over failed banks. The *Acquisition Number* for the BHCs is, on average, 1.51, and it ranges between 1 and 4. On average, they acquire 1.02 targets in a given quarter.

[TABLE II]

3. Does Franchise Value Survive Failure?

We consider the following pooled cross-sectional regression model for our analysis: In this model, we define the value of targets as a function of a dummy variable for the FDIC-assisted acquisitions, core deposits, number of branches, a set of control variables (*Target Controls*), and year fixed effects.

$$\begin{aligned} Price\_Asset\_Ratio_{it} = {} & \beta_0 + \beta_1 \times Assisted\_Dummy_{it} + \beta_2 \times Core\_Deposits_{it} + \beta_3 \times Log\_Branch_{it} + \\ & \beta_{12} \times Assisted\_Dummy \times Core\_Deposits + \beta_{13} \times Assisted\_Dummy \times Log\_Branch + \\ & Controls_{it} \times B + \sum_{y=2007}^{2015} \eta_y \times Year\_Dummy_{y,t} + \varepsilon_{it} \end{aligned} \quad , \quad (1)$$

[13] CAMELS scores are not available for BHCs.

where the individual bank and time dimension are represented by i and t subscripts, respectively.

The main variables are defined as follows:

Price Asset Ratio = 100 × [value of acquired bank] / [total assets of acquired bank]. The numerator is the price paid by the acquirer at the announcement date of acquisition, for the non-assisted deals. For the FDIC-assisted transactions, the numerator is the summation of the discount received for the purchase of total assets and the premium paid for the assumption of the deposits. The discount takes a negative value, but the premium is a positive number.[14] For the deals with a loss-share agreement, we add the value of the loss-share agreement to the numerator with a negative sign. The value of the loss-share agreement is the product of the percentage of the loss-share agreement (tranche), the loss-share amount, and the probability of loss. The first two items are obtained from the FDIC website, and the last item is estimated by calculating the average ratio of the net charge-off on the gross loans of failed banks over their last four quarters of operation. Since the bidders might value the assets and deposits of failed banks based on different factors, we study the prices of the assets and deposits of failed banks separately. We use the summation of the discounts on assets (*Asset Discount*) and the value of the loss-share agreement (*Loss Share Value*) as the auction value of the assets of the failed banks (*Asset Discount* & *Loss Share Value*) and the premium paid to assume the deposits as the value of the deposits (*Deposit Premium*).

Assisted Dummy Variable = A dummy variable that is equal to one for the FDIC-assisted acquisitions, and zero otherwise. It is important to include the *Assisted Dummy* to absorb the unquantifiable differences between the values of the targets in the FDIC-assisted and non-assisted acquisitions.

[14] For instance, imagine a winning bidder offers a $10,000 discount to purchase the assets, and offers a $2,000 premium to assume the deposits of an auctioned bank. Please also assume that there is no loss-share agreement. The price of acquiring such a failed bank is minus $8,000.

Core Deposits = The share of core deposits in total liabilities of the target bank. Core deposits, in the Uniform Bank Performance Report (UBPR) and until March 31, 2011,[15] are defined as the sum of demand deposits, all NOW and automatic transfer service (ATS) accounts, money market deposit accounts (MMDAs), other savings deposits, and time deposits under $100,000.

Log_Branch = the logarithm of *Number Branch*. Branches are the main conduit for interacting with clients and attracting deposits and new business opportunities (Salop 1979; Ramírez 2003; Chu 2010; Staikouras 2006; LaPlante and Paradi 2015). Branches create physical proximity and enable banks to enjoy lower transportation and monitoring costs, and execute spatial price discrimination over their clients (Petersen and Rajan 1995; Hannan and Prager 2004; Degryse and Ongena 2005).[16] As for *Core Deposits*, we expect a positive relationship between *Log_Branch* and the value of a bank.

Controls = the vector of bank-level control variables. We introduce three indicators for loan quality: 1) the ratio of non-performing loans to total loans (*Non-Performing Loans*); a higher value of non-performing loans represents a lower loan quality and a higher credit risk; 2) the share of other real estate owned to total assets (*OREO*), which reflects the distressed real estate properties that are held due to foreclosure (Johnston-Ross, Ma, and Puri 2021); 3) the ratio of commercial mortgages to total loans (*Commercial Mortgage*), because Cole and White (2012) show that banks with a higher *Commercial Mortgage* have a higher probability of failure. We

[15] As of March 31, 2011, the definition changed: In the new definition, insured brokered deposits are excluded from core deposits; and in line with the increase in FDIC deposit insurance coverage from $100,000 to $250,000, the ceiling of time deposits is adjusted.

[16] The literature also shows that expanded branches promote diversification in lending and funding sources (Darroch 1994, p. 84, as quoted in Chu 2010; Ramírez 2003; Carlson 2004), reduce contracting frictions, enhance capital flows across local markets (Gilje, Loutskina, and Strahan 2016), improve lending quality (Jayaratne and Strahan 1996), and increase financial stability – in particular for larger banks (Hirtle and Stiroh 2007).

control for inefficiency as the ratio of non-interest expense to total assets (*Inefficiency*).[17] We expect less efficient targets or those with lower loan quality to have a lower value. We consider the share of liquid assets to total assets (*Liquid Assets*) in our model. Since liquid assets are more transparent and their valuation is less ambiguous, we expect that target banks with more *Liquid Assets* are taken over at a higher price, given all other factors constant. This is in line with the prediction of optimal bidding strategies proposed by Wilson (1977) and Kagel and Levin (1986) that bidding price is negatively linked to the degree of uncertainty about the value of the auctioned item. We also use the ratio of noninterest income to total assets in our model in order to capture heterogeneity in banks' business models. The value of a bank depends also on its market share; hence we add to the model the market share of the target in the state where it operates (*Market Share*). Finally, we control for time fixed effects by introducing nine annual dummy variables.[18]

To study the pricing of the franchise value of failed banks, we consider the interaction term between *Assisted Dummy* and *Core Deposits* (*Assisted Dummy* × *Core Deposits*) and between *Assisted Dummy* and *Log_Branch* (*Assisted Dummy* × *Log_Branch*). It disentangles the effect of *Core Deposits* and *Log_Branch* on *Price Asset Ratio* for the two sub-samples of acquired banks. The coefficient of the interaction term can be:

- negative, which would indicate that the franchise value of failed banks has a lower price than that of healthy banks;
- zero, which would indicate that the franchise values of failed banks and healthy banks have a similar price; or
- positive, which would indicate that the franchise value of failed banks has a higher price than that of healthy banks.

[17] We divide non-interest expense by total assets, because for failed banks operating income can be negative or be close to zero.

[18] The sample covers ten years: 2007-2016. We consider the year 2007 as the benchmark.

Each item is a plausible outcome; nevertheless, the first outcome is mostly expected, since, for instance, some clients might move their accounts to other banks after the acquisition. A zero coefficient would indicate that the franchise embedded in core deposits and branch networks is unrelated to the loan investment decisions (a Modigliani-Miller irrelevance-type result). A positive coefficient is expected if the nervous clients have already abandoned the insolvent bank, so that the remaining clients are really inertial and hence are more valuable for the acquirer.

However, this model assumes that assisted and non-assisted transactions are not fundamentally different. We test the validity of this assumption using a Chow-like F-test on the joint significance of the interaction terms of *Assisted Dummy* and all other explanatory variables.[19] The result indicates that we should estimate a separate regression for each sub-sample (hereinafter "preferred specification of Equation (1)").

Panel A of Table III presents the results of estimating the preferred specification of Equation (1): In column (1), we estimate the model with the use of the 370 observations on non-assisted acquisitions. We find that an increase in *Core Deposits* is associated with a higher *Price Asset Ratio,* whereas the coefficient of *Log_Branch* is insignificant.

Column (2) presents the results when we estimate the model with the use of the 234 observations on banks that were acquired through the FDIC-assisted deals. As expected, the relationships between the explanatory variables and *Price Asset Ratio* are different from the results in column (1). Importantly, *Core Deposits* does not have a significant relationship with *Price Asset Ratio.*

[19] The result of the test is not reported here but is available from the authors upon request.

However, there is a significantly positive link between *Log_Branch* and *Price Asset Ratio*: Failed banks with more branches are sold at higher prices. If we assume that all other observable factors are constant, a one percent increase in the number of branches of a failed bank is associated with a 1.85% increase in *Price Asset Ratio*. By acquiring a failed bank with a larger number of branches a bank can expect to have a broader geographic reach; and this reach cannot be destroyed by failure.

With regard to the control variables, for non-assisted acquisitions (Column 1) the coefficients on *Non-Performing Loans* and *OREO* show that the price of healthy targets is significantly correlated to the quality of their loan portfolio. However, *Inefficiency, Commercial Mortgage, Noninterest Income,* and *Liquid Assets* exhibit no significant link with *Price Asset Ratio*. Banks with a higher *Market Share* have a higher *Price Asset Ratio*. The F-test shows that the coefficients of the year dummy variables are jointly significant. The coefficients on these annual dummy variables reflect the change in the *Price Asset Ratio* for factors, which are not captured by the explanatory variables. All of the coefficients are significantly negative: The *Price Asset Ratio* significantly decreased after 2007.[20]

For assisted acquisitions (Column 2), the coefficients on *Non-performing Loans, OREO* and *Commercial Mortgage* show that the prices of failed banks do not depend on loan quality. Other control variables including *Inefficiency, Noninterest Income,* and *Market Share* also do not exhibit a significant relationship with *Price Asset Ratio,* whereas an increase in *Liquid Assets* is associated with a higher *Price Asset Ratio* of failed banks. This is in line with Granja (2013), who finds that failed banks with a higher liquidity ratio are sold at lower estimated costs. The coefficients of the year dummy variables are jointly significant. We find that the coefficients for

[20] We consider the year 2007 as the base group.

the years 2008, 2013, and 2015 – the years with the lowest numbers of bank failures – are significantly positive: The *Price Asset Ratio* of failed banks depends on the number of failures in a year, because when the number of failures increases, the investment opportunity set for acquiring banks becomes larger (Acharya and Yorulmazer 2007).[21]

We conduct a Blinder-Oaxaca decomposition analysis.[22] The result is reported in Panel B of the table. The mean predictions of *Price Asset Ratio* of healthy and failed banks are presented in the first and second rows, respectively, and the difference – 29.11 – between the means of the two groups of targets is presented in the third row. The difference is statistically significant at 1%.

The second part of the panel shows the decomposition of the difference between the *Price Asset Ratio* of healthy and failed banks. The difference is divided into three parts: *Endowments* reflects that the mean value of *Price Asset Ratio* of failed banks would increase by 6.04% if they had the same characteristics as healthy targets. *Coefficients* shows a 14.88% increase in failed banks' *Price Asset Ratio* if we use the coefficients of the healthy banks' regression estimation, as presented in column (1), for the failed banks. *Interaction* reports the simultaneous impact of differences in *endowments* and *coefficients*, which is equal to 8.19%. All of the three parts of the difference are statistically significant at 1%.

In column (2), we do not find a significant relationship between the price of failed banks and the indicators of loan quality. One plausible explanation is that the loss-share agreement between the FDIC and the acquirers of failed banks mitigates the sensitivity of the bids to the loan quality of failed banks. To go deeper we limit the sample of the FDIC-assisted acquisitions to those without the loss-share agreement. The result reported in column (3) shows that, in the

[21] There are few failures during 2007-2008 and 2013-2016 relative to the 2009-2012 timespan.

[22] Please refer to Blinder (1973), Oaxaca (1973), and Jann (2008) for more details.

absence of the loss-share agreement, failed banks with more *Commercial Mortgage* are sold at a lower price, holding other factors constant. The finding partly supports our prediction and is in line with the claim of Cole and White (2012).

In columns (4) and (5), we use the two components of *Price Asset Ratio* of failed banks as the dependent variable. This enables us to explore whether explanatory variables have different relationships with *Deposit Premium* vis-à-vis *Asset Discount* & *Loss Share Value*. In column (4), we use the summation of *Asset Discount & Loss Share Value* as the dependent variable and re-estimate our model. As expected, the result is very similar to the findings in column (2). We also estimate the model using the sample of the FDIC-assisted acquisitions without the loss-share agreement. The result, which is not reported in the table, shows that *Asset Discount* of failed banks is negatively correlated with *Commercial Mortgage.* The finding is similar to the result reported in column (3).

In column (5), *Deposit Premium* is used as the dependent variable. We find that *Deposit Premium* increases with an increase in *Core Deposits*; acquirers of failed banks pay, on average, 0.8% more premium for a one percent increase in *Core Deposit.* However, *Log_Branch* exhibits insignificant relationships with *Deposit Premium*. Contrary to the results in columns (2) and (4), the coefficients of the year dummy variables in this specification are significantly positive for the years 2009 and 2010. This suggests that acquirers tend to pay a higher price for core deposits in crisis times.

To investigate whether the prices of the assets and deposits of failed banks are influenced by the financial condition of the acquirers, we add the following three indicators of financial strength and inefficiency of acquirers (hereinafter called "*Acquirer Financials"*) to our specifications in columns (4) & (5): *Acquirer Tier1 Ratio* = Tier 1 capital divided by total risk-

weighted assets of acquirer banks; *Acquirer Non-Performing Loans* = The ratio of non-performing loans to total loans of acquirer banks*; Acquirer Inefficiency* = The ratio of total non-interest expense to total operating revenue of acquirer banks.

The results are reported in columns (6) and (7), respectively. Inclusion of these variables reduces the sample size to 214. In column (6), we find that *Asset Discount* & *Loss Share Value* are not significantly affected by *Acquirer Tier1 Ratio* and *Acquirer Non-Performing Loans;* however, being a less efficient acquirer is associated with a lower acquisition price.[23]

Column (7) presents the result for *Deposit Premium*. The coefficient of *Acquirer Financials* shows that an increase in *Acquirer Tier 1 Ratio* is associated with an increase in *Deposit Premium*. This is because a higher capitalization creates capacity for acquirers to assume more core deposits and therefore, they have a higher willingness to pay for deposits, which supports the claim of Granja et al. (2017). *Acquirer Non-performing Loans* depicts an insignificant relationship with *Deposit Premium*. However, the result shows that more inefficient acquirers tend to pay a lower *Deposit Premium*, which is similar to our findings in column (6) where we use *Asset Discount & Loss Share Value* as the dependent variable. In addition, we find that acquirers tend to pay a higher *Deposit Premium* for failed banks with larger *Market Shares*.

[TABLE III]

We do not include *Size* in our analysis, because of multicollinearity issues. The R-squared of regression of *Size*, represented by the logarithm of total assets, on all other explanatory variables for the FDIC-assisted and the non-assisted acquisitions are 79% and 67%, respectively. As a robustness check of our results, we include the orthogonalized value of *Size* in our models. The results for the sample of failed banks remain unchanged qualitatively, and the

[23] If "inefficiency" is associated with fee-based services, it may be that the acquisition of insolvent banks – which became insolvent because of failed loans – fits less well with the fee-based services.

coefficient on the orthogonalized *Size* is insignificant. For the non-assisted acquisitions, the results on other explanatory variables are quantitatively the same as our finding in column (1), and the coefficient on the orthogonalized *Size* is negative at 10% significance level.

We also conduct several robustness checks to assess the accuracy of the significantly negative relationship between *Acquirer Inefficiency* and the prices of assets and deposits of failed banks.[24] The relationship between *Acquirer Inefficiency* and the dependent variables across different specifications can be spurious, because *Acquirer Inefficiency* may represent other financial indicators that are not included in the specifications. To address this concern, we add *Acquirer CAMELS* scores and *Acquirer Core Deposits* to the model. The results indicate that the significantly negative coefficient of *Acquirer Inefficiency* persists. *Acquirer Inefficiency* is defined as the ratio of noninterest expense to total operating income; hence, as we noted above, the "inefficiency" measure may be a proxy for the level of noninterest income activities. Therefore, we add the share of noninterest income in total operating income: *Acquirer Noninterest Income*; however, we find that adding this variable does not significantly change our results. In addition, we exclude *Acquirer Non-performing Loans* and *Acquirer Tier 1 Ratio* from the model to avoid potentially spurious relationships that might be driven by multicollinearity problems.[25] Again, the result shows a significantly negative relationship between *Acquirer Inefficiency* and the price of purchasing the assets and assuming the core deposits of failed banks.

Another plausible explanation is that inefficient acquirers could be located in the county of the failed banks, and the FDIC may give priority to such local and inefficient acquirers to purchase failed banks, notwithstanding the FDIC's least-costly-resolution policy. We assess the validity of this scenario by adding a dummy variable to the model for the acquisitions that both

[24] The estimations are not presented in the paper but are available from the authors upon request.

[25] It is worth noting that the correlations between our three indicators of financial strength are relatively low.

acquirer and failed bank are located in the same county (*Same County*). The result, however, indicates that the dummy variable is insignificant, and inclusion of this dummy variable does not significantly affect the relationship between *Acquirer Inefficiency* and the acquisition price.[26]

3.1. Decomposition of Acquirer's Inefficiency

In this sub-section, we use the decomposition of *Acquirer Inefficiency – Acquirer Labor Cost* and *Acquirer Other Expenses* – to examine more closely the relationship between *Acquirer Inefficiency* and the price of acquiring a failed bank. Table (IV) reports the results. In columns (1) and (2), we re-estimate the specification in column (6) of table (III), where we use *Asset Discount & Loss Share Value* as the dependent variable, but we replace *Acquirer Inefficiency* with *Acquirer Labor Cost* and *Acquirer Other Expenses*, respectively. We find a significantly negative coefficient only for *Acquirer Labor Cost*. Columns (3) and (4) report the results for *Deposit Premium* as the dependent variable. We find that the coefficients on both *Acquirer Labor Cost* and *Acquirer Other Expenses* are negative and statistically significant.

We dig further by exploring whether the result obtained on *Acquirer Labor Cost* is driven by the number of employees of acquirers or the salaries of the employees. To address this question, we use *Acquirer Wage* and *Acquirer Employees* in our analysis instead of *Acquirer Labor Cost* and re-estimate our specification in column (1). The results are reported in columns (5) and (6), respectively. The coefficients of *Acquirer Wage* and *Acquirer Employees* are statistically insignificant. In columns (7) and (8) we re-estimate our models presented in columns (5) and (6) and use *Deposit Premium* instead of *Asset Discount* & *Loss Share Value* as the dependent variable. The coefficient of *Acquirer Employees* is significantly negative in column (7), which implies that acquirers with more employees pay a lower premium to assume the core

[26] The estimations are not presented in the paper but are available from the authors upon request.

deposits of failed banks. However, *Acquirer Wage* does not exhibit a significant relationship with *Deposit Premium* in column (8).

To check the robustness of our findings, we divide the number of employees of acquirers by total assets in lieu of total operating revenue and estimate our model. The result, which is not reported in the table, shows that the significantly negative relationship between the number of acquirers' employees and *Deposit Premium* holds. This relationship could be driven by an acquirer's number of branches, because one can expect that the number of employees increases with the number of branches. We address this question in the last column, by including the logarithm of *Acquirer Branch* (*Acquirer Log_Branch*) in our model. We find that *Acquirer Log_Branch* is statistically insignificant; however, the coefficient of *Acquirer Employees* remains significantly negative.[27]

[TABLE IV]

3.2. The Role of Competition in the Auctions Organized by the FDIC

We find a persistently negative relationship between the inefficiency of acquirers and the price of acquiring a target. Further analysis shows that acquirers with more employees tend to pay a lower premium to assume the deposits of failed banks. One plausible explanation for the result is that in less competitive auctions, the acquisition price is lower and at the same time less efficient/overstaffed banks may win the auction.

In order to examine the validity of this scenario, we include the number of bidders (*Number Bidders*), as a proxy for competition, to our specifications in columns (5) and (7) of table (IV). We present the results in Table (V). We use *Asset Discount* & *Loss Share Value* and

[27] We also explore whether the relationship between *Acquirer Employees* and *Deposit Premium* becomes stronger with the increase in the number of branches of failed banks. We include the interaction term between *Log_Branch* and *Acquirer Employees* in an unreported regression and find that the coefficient of the interaction term is statistically insignificant.

Deposit Premium as the dependent variable in columns (1) and (2), respectively. The *Number Bidders* variable is significantly positive in both columns, which implies that the acquirers of failed banks receive a lower *Asset Discount* & *Loss Share Value*, and pay a higher *Deposit Premium* in a more competitive auction. The finding supports the claim of Giliberto and Varayira (1989) and is in line with the prediction of the theory of optimal biding strategies (Wilson 1977; Kagel and Levine 1986). Nonetheless, the significantly negative relationship between *Acquirer Employees* and the dependent variable persists in column (2), where we use *Deposit Premium* as the dependent variable.

The economic significance of the relationship is meaningful: One more bidder that attends the auction increases *Asset Discount* & *Loss Share Value*, and *Deposit Premium* by about 1.2% and 0.1% from the mean, respectively. A one percent increase in *Acquirer Employees* from the mean is associated with about 0.012% decrease in *Deposit Premium*. Inclusion of *Number Bidders* increases the economic significance of *Log_Branch* in column (1) to a 2.16% increase in *Asset Discount & Loss Share Value* for a one percent increase in *Log_Branch*.

[TABLE V]

We also investigate whether the relationship between *Acquirer Employees* and *Deposit Premium* varies with the degree of competition by including the interaction term of *Acquirer Employees* and the *Number Bidders* and find that it is statistically insignificant.

4. Further Investigations

We find robust evidence showing that bidders with higher labor costs pay lower prices to acquire failed banks. Also, bidders with more employees pay lower premiums to assume the core deposits of failed banks. This opens two important questions: 1) Do the efficiency and financial strength of acquirers play a role in acquiring a failed bank through the auctions that are organized

by the FDIC as compared with a solvent target outside the FDIC mechanism? and 2) How important are the efficiency and financial strength of acquirers for winning the acquisition of multiple failed banks relative to the acquisition of multiple healthy targets?

4.1. Financial Strength and Efficiency of Failed Banks' Acquirers

In this section, we investigate whether the financial strength and efficiency of acquirers matters differently when acquiring an insolvent bank and a solvent bank. Specifically, we examine the relationship between acquirers' efficiency and financial strength and the probability of acquiring insolvent banks versus solvent banks. We define a dummy variable (*Assisted Acquisition*) that takes the value of one for the FDIC-assisted acquisitions, and zero for non-assisted acquisitions. We define *Assisted Acquisition* as a function of *Relative Size*, *Acquirer Financials, Acquirer Controls* and year fixed effects. We estimate our pooled cross-sectional regression model using logit regressions:

$$Assisted\_Acquisition_{it} = \alpha + \beta \times Relative\_Size_{it} + Acquirer\_Financials_{it} \times \Gamma + Acquirer\_Controls_{it} \times \Delta + \sum_{y=2007}^{2015} \eta_y \times Year\_Dummy_{y,t} + \varepsilon_{it} \quad , \qquad (2)$$

where the individual bank and time dimensions are represented by i and t subscripts, respectively. The explanatory variables are defined as follows:

Relative Size is the ratio of total assets of the acquirer to total assets of the target. *Acquirer Financials* includes *Acquirer Tier1 Ratio*, *Acquirer Non-Performing Loans*, and *Acquirer Inefficiency*.

We include the following five control variables, collectively called *Acquirer Controls*, in our analysis: *Acquirer CAMELS Score* = the CAMELS score; *Acquirer Core Deposits; Acquirer Net Interest Margin* = interest income minus interest expense divided by total earning assets; *Acquirer Non-Interest Income* = The income from non-interest activities divided by total

operating income; and *Age* = the difference between the current year and the year of establishment.

Table VI reports the estimation results of Equation (2) using logit regressions. We estimate the probability of acquiring a failed bank in the FDIC-assisted deals (*Assisted Acquisition*) versus a solvent bank as a function of the financial strength of acquirers and the control variables. In the first column, we use 246 observations for our analysis. The sample includes 32 non-assisted takeovers by commercial banks and 214 FDIC-assisted deals.

The results show that acquirers of failed banks tend to have a larger *Relative Size* as compared to the acquirers of healthy targets only at the 10% significance level. There is no significant difference between acquirers of healthy and failed banks in terms of *Tier 1 Ratio*. Nonetheless, we observe that the probability of success in the FDIC-assisted acquisitions is positively correlated with *Acquirers Non-Performing Loans* and *Acquirers Inefficiency*.[28] We find that there is a negative relationship between *Acquirers CAMELS Score* and the *Assisted Acquisition*, which is in line with our expectation, given that having a good (i.e., numerically low) CAMELS rating is one of the criteria to be eligible for bidding in the FDIC auctions. *Acquirer Core Deposits* and *Acquirer Net Interest Margin* exhibit no significant relationship with the dependent variable. The result also shows that the acquirers of failed banks tend to have a higher *Non-Interest Income* and they are, on average, older than the acquirers of healthy targets.

Column (2) reports the marginal effects at the mean. According to the result in this column, a one percent increase in *Acquirer Inefficiency* from the mean is associated with a 0.2% increase in the probability of acquiring a failed bank. The average inefficiency of acquirers of

[28] In two unreported regression estimations, we use *Acquirer Labor Cost* and *Acquirer Other Expenses* instead of *Acquirer Inefficiency* and find similar results: The probability of success in the FDIC auctions is positively associated with *Acquirer Labor Cost* and *Acquirer Other Expenses*. We also use *Acquirer Employees* and *Acquirer Wage* instead of *Acquirer Inefficiency* in our model and find that both have insignificant coefficients.

healthy and failed banks is 68.47%, and one percent of it equals 1.46%. Hence, the relationship is economically meaningful.

In columns (3) and (4), we examine whether in more competitive auctions for selling failed banks, acquirers of failed banks are more efficient and financially stronger than the acquirers in non-assisted acquisitions. We therefore limit our sample of the FDIC-assisted acquisitions to relatively more competitive auctions. We consider only the auctions where at least 3 bidders attend. This reduces the sample of the FDIC-assisted acquisitions from 214 to 117.

The coefficients and marginal effects at the mean are presented in columns (3) and (4), respectively. The results show that imposing this restriction increases the significance level of all of the indicators of *Acquirer Financials* other than *Acquirer Tier 1 Ratio*, which remains insignificant. The probability of success in the FDIC auctions increases with the increases in *Acquirer Relative Size*, *Acquirer Non-Performing Loans*, *Acquirer Inefficiency*, *Acquirer Non-Interest Income*, and *Acquirer Age* and obtaining a better *CAMELS score*. The result shows that, even in more competitive auctions, an increase in the inefficiency of acquirers predicts a higher probability of acquiring a failed bank. As reported in column (4), the marginal effects at the mean of *Acquirer Inefficiency* is tripled in this specification.

[TABLE VI]

4.2. Financial Strength and Probability of Multiple Acquisitions

Our data show that there are acquirers that absorbed multiple targets during our study period. We expect that the acquirers of multiple failed banks must be stronger than other acquirers to win the auctions repeatedly. However, the claim of Igan et al. (2017) - that banks

that engage in lobbying have a higher chance to win the FDIC auctions - casts doubt on this expectation.

In this sub-section, we examine whether such banks are financially stronger than those that acquire only one bank throughout our sample period. We define a dummy variable that takes the value one when an acquirer absorbs more than one target, and zero otherwise. We use this dummy variable as the dependent variable in Equation (2) and estimate our model (with logit regressions) for the FDIC-assisted acquisitions only.[29]

Table VII illustrates the results: In columns (1) and (2), the dependent variable is the probability of multiple takeovers during the study period: 2007:Q1-2016:Q3 (excluding multiple takeovers in the same quarter). The results show that having a larger *Relative Size* increases the probability of acquiring multiple failed banks. Marginal effects at the mean reported in column (2) show that a one percent increase from the mean in *Acquirer Relative Size* is associated with a 0.6% increase in the probability of acquiring multiple failed banks. We find no significant relationship between *Acquirer Tier 1 Ratio* and the dependent variable. A higher probability of taking over multiple failed banks is associated with a higher *Acquirer Non-Performing Loans*. The probability of acquiring multiple failed banks increases by 3.4% with a one percent increase from the mean in *Acquirer Non-performing Loans*. The economic significance is meaningful, because the average *Non-performing Loans* for acquirers of failed banks in our sample is 3.4%. The significantly positive coefficient of *Acquirer Non-performing Loans* can be due to previous acquisitions of failed banks.

[29] We do not estimate the model for the sample of commercial banks that acquire multiple healthy banks due to the lack of adequate data. For BHCs that acquire multiple healthy banks, the Wald test rejects the statistical significance of the model. Hence, we do not report the results in the paper.

Acquirer Inefficiency,[30] *Acquirer CAMELS Score*, and *Acquirer Core Deposits* are insignificant. However, we find that the probability increases with an increase in *Acquirer Net Interest Margin* and *Acquirer Non-Interest Income*. An increase in *Acquirer Age* is associated with a lower probability of acquiring multiple failed banks. Overall, the result shows that commercial banks that acquire multiple failed banks are not financially stronger than other acquirers.

In columns (3) and (4), the dependent variable is a dummy variable that takes the value of one when the acquirer takes over more than one target in a given quarter, and zero otherwise. The sample is restricted to the FDIC-assisted acquisitions, because in our sample there are only 3 observations on multiple acquisitions of healthy targets in a given quarter by a BHC.

The results show that acquirers with a higher *Tier 1 Ratio* have a higher probability of acquiring multiple failed banks in a given quarter, which is in line with our expectation because better capitalized banks have a larger capacity to purchase assets and assume core deposits of failed banks. This finding also supports the prediction of Granja et al. (2017) that higher capitalization increases the probability of wining the FDIC auctions. Nevertheless, the relationship is not economically substantial, as a one percent increase from the mean of Acquirer *Tier 1 Ratio* – which is 14.82% in our sample – predicts a 1% increase in the probability of acquiring multiple failed banks in the same quarter. A one percent increase approximately equals 7% of the mean *Tier 1 Ratio*.

[TABLE VII]

5. Concluding Remarks

[30] In two unreported regression estimations, we use *Acquirer Labor Cost* and *Acquirer Other Expenses* instead of *Acquirer Inefficiency* and find that both have insignificant coefficients. We also use *Acquirer Employees* and *Acquirer Wage* instead of *Acquirer Inefficiency* in our model and find similar results.

In the U.S., the FDIC resolves failed banks by selling them to healthy financial institutions. The sale is conducted in the form of an auction that is open to eligible acquirers that are invited by the FDIC. There are two major concerns regarding the resolution process: a) whether failed banks are sold at a fair price; and b) whether the FDIC sells failed banks to appropriate acquirers. The FDIC attempts to address these two concerns by setting certain criteria for eligible bidders, and by assessing the bids and choosing the one that is the least costly to the deposit insurance fund.

In this paper, we extend the literature on the sale of failed banks by examining the factors that could explain the auction prices of the assets and core deposits of failed banks by considering a framework where the purchase and assumption of failed banks in the FDIC auctions are compared with the takeover of healthy banks.

We build a sample of U.S. commercial banks that were acquired through the FDIC's P&A deals and a group of banks that were purchased without the FDIC's assistance. Our sample consists of 234 banks that were acquired under P&A transactions and 386 banks that were acquired through non-assisted deals between 2007:Q1 and 2016:Q3. The descriptive statistics show that on average, bidders paid a 0.35% premium for assuming the deposits of failed banks and received on average a 13.68% discount for the purchase of the assets of failed banks.

We find that the pricing of failed banks in the FDIC-assisted auctions is fundamentally different from the pricing of healthy acquired banks in non-assisted acquisitions. For instance, the pricing of failed banks, contrary to healthy banks, does not show a significant sensitivity to loan quality indicators. This is possibly due to the loss-share agreement signed by the FDIC and the winning bidders. In addition, the driving factors of the prices of assets and of core deposits of the failed banks are different. We find that the assets of failed banks with more branches or

liquid assets are sold at a higher price, holding other factor constants, whereas, in principle, the FDIC is known to charge a premium from acquirers for assuming core deposits.

This study contributes to the literature by showing that the premium for the franchise value of failed banks is embedded also in the size of their branch networks and not merely in their core deposits. The analysis reveals that the auction price of core deposits of failed banks can be better explained within the independent private values framework, as our investigation indicates that acquirers with a lower capitalization or more employees pay lower premiums to assume the core deposits of failed banks. This result holds even when we control for the impact of competition on the acquisition prices. One possible implication of our findings is that the FDIC may favor acquirers with more employees because they are expected to better serve the depositors of the failed banks.

The results also show that the prices of failed banks increase with the number of bidders that attend the auctions organized by the FDIC. We then examine the inefficiency and the financial strength of the acquirers of failed banks vis-à-vis the acquirers of healthy banks. The results show that an increase in inefficiency and non-performing loans of acquirers is associated with a higher probability of acquiring failed banks rather than healthy banks. The findings persist even when we limit the FDIC-assisted deals to those that are more competitive. The results imply that even though CAMELS scores might play a useful role in ranking potential bidders, the scores do not carry sufficient information as to the bidders' inefficiency and loan quality. Moreover, the results suggest that acquirers that cope with larger amounts of non-performing loans prefer failed banks to healthy banks for takeovers, possibly because they have better expertise in managing troubled assets or because such deals are more accessible.

In our dataset there are acquirers that absorb multiple failed banks. We examine the financial strength of such acquirers and find that – compare to the banks that only acquire one failed bank – they do not have significantly different capital ratios, but they acquire relatively smaller failed banks.

The findings of this study have important implications for policymakers, as they show that to sell failed banks at a higher price, not only must competition be increased but also the mechanism of the auctions and the criteria for inviting eligible bidders might need to be revisited. For instance, the FDIC may consider inviting bidders that be willing to pay a larger premium for the branches of failed banks or for the amount of liquid assets of failed banks.

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Table I. Variable Description

This table presents description of variables used in this study.

Variables	Description
Assisted Acquisition	A dummy variable equals to one for the FDIC-assisted acquisitions, and zero otherwise.
Deal Characteristics	
Price Asset Ratio	*Price Asset Ratio* = 100 × [value of acquired banks] / [total assets of acquired banks]. The numerator is the price paid by the acquirer at the completion date of acquisition, for the non-assisted deals. For the FDIC-assisted transactions, the numerator is the summation of the discount received for the purchase of total assets and the premium paid for assumption of deposits. The discount takes a negative value, but the premium is a positive number. For the deals with a loss-share agreement, we add the value of the loss-share agreement to the numerator with a negative sign. The value of loss-share agreement is the product of the percentage of the loss share agreement (tranche), loss share amount and probability of loss. The first two items are obtained from the FDIC website and the last item is estimated by calculating the average net charge-off on gross loans ratio of failed banks over their last four quarters of operation.
Deposit Premium	The premium paid by an acquirer for assumption of a failed bank's core deposits divided by core deposits of the failed bank.
Asset Discount	The discount received by an acquirer for purchase of a failed bank's total assets divided by total assets of the failed bank.
Loss Share Value	The expected value of the FDIC's commitment to share some of the future losses of the acquiring bank of a failed bank. The value of loss-share agreement is the product of the percentage of the loss share agreement (tranche), loss share amount and probability of loss. The first two items are obtained from the FDIC website and the last item is estimated by calculating the average net charge-off on gross loans ratio of failed banks over their last four quarters of operation.
Number Bidders	The number of bidders who attend the auction for selling a failed bank.
Same County	A dummy variable that takes the value of one when both acquirer and target are in the same county, and zero otherwise.
Acquirers Characteristics	
Acquirer Relative Size	The ratio of total assets of an acquirer to total assets of the target.
Acquirer Tier 1 Ratio	Tier 1 risk-based capital ratio of an acquirer. The ratio equals tier 1 capital divided by total risk-weighted assets.
Acquirer Non-Performing Loans	The ratio of non-performing loans of an acquirer to its total loans. Non-performing loans consist of nonaccrual loans and loans which are past due for 90 days or more and still accruing.
Acquirer Inefficiency	The ratio of total non-interest expense of an acquirer to its total operating revenue. Total non-interest expense includes salary and benefits, occupancy and equipment, and other non-interest expense.
Acquirer Labor Cost	The ratio of employees' salaries and benefits of an acquirer to its total operating revenue.
Acquirer Other Expenses	The ratio of occupancy and equipment expenses and other non-interest expenses of an acquirer to its total operating revenue.
Acquirer Employees	The ratio of number of full-time employees of an acquirer to its total operating revenue.
Acquirer Wage	The ratio of employees' salaries and benefits of an acquirer to its total number of full-time employees.
Acquirer CAMELS Score	The CAMELS stands for Capital Adequacy, Assets, Management Capability, Earnings, Liquidity and sensitivity. Eligible acquirers must hold acceptable CAMELS ratings.
Acquirer Core Deposits	The share in total liabilities of core deposits of an acquirer. Core deposits, in the Uniform Bank Performance Report (UBPR) and until March 31, 2011, are defined as the sum of demand deposits, all NOW and automatic transfer service (ATS) accounts, money market deposit accounts (MMDAs), other savings deposits, and time deposits under $100,000.
Acquirer Net Interest Margin	Interest income minus interest expense of an acquirer divided by its total earning assets.
Acquirer Non-Interest Income	The income from non-interest activities of an acquirer divided by its total operating income.
Acquirer Age	The difference between the current year and the year of establishment of an acquirer.
Acquirer Branch	The number of branches of an acquirer.
Acquisition Number	The number of acquisitions of either healthy or failed banks by one acquirer during the study period.
Acquisition Quarter	The number of acquisitions of either healthy or failed banks by one acquirer in each quarter.
Targets Characteristics	

Core Deposits	Share of core deposits of a target in its total liabilities.
Number Branch	The number of branches of a target.
Non-Performing Loans	The ratio of non-performing loans of a target to its total loans.
Commercial Mortgage	The share of commercial mortgage of a target in its total loans.
OREO	The ratio of other real estate owned of a target to its total assets.
Liquid Assets	The ratio of liquid assets of a target to its total assets.
Inefficiency	The inefficiency of a target calculated as the ratio of total non-interest expense to total assets.
Market Share	The market share of a target in a given state. The market share is calculated based on total assets.
Equity Asset Ratio	The equity capital to asset ratio of a target.
Non-Interest Income	The income from non-interest activities of a target divided by its total operating income.
Age	The difference between the current year and the year of establishment of a target.

Table II. Descriptive Statistics

Panel A. Targets

This panel presents general descriptive statistics and deals specifications for targets of FDIC-assisted and non-assisted acquisitions over 2007:Q1 and 2016:Q3 period.

		Targets of Non-Assisted Takeovers					Targets of Assisted Takeovers					
	Variable	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	T-Stat
Targets Characteristics	Total Assets	386	478	1,549	7	11,698	234	424	791	20	5,681	0.49
	Core Deposits	386	83.23	13	40.72	99.93	234	75.88	19.79	15.59	99.6	5.58***
	Number Branch	386	7.47	18.47	1.00	127.00	234	5.92	8.35	1.00	55.00	1.21
	Non-performing Loans	386	2.94	4.1	0	20.65	234	18.61	8.67	2.05	44.78	-30***
	OREO	370	0.64	1.23	0.00	6.79	234	5.91	5.21	0.00	24.47	-19***
	Commercial Mortgage	386	32.88	18.75	0.00	73.97	234	37.44	14.62	7.83	73.46	-3.18***
	Liquid Assets	386	31.96	18.61	0.00	89.95	234	22.56	9.48	6.44	49.88	7.18***
	Inefficiency	386	0.93	0.45	0.09	3.11	234	1.17	0.5	0.38	3.4	-6.09***
	Market Share	386	0.3	1.11	0.00	8.67	234	0.19	0.39	0	2.45	1.43
	Equity Asset Ratio	386	10.97	4.23	2.88	27.31	234	1.24	2.02	-4.24	7.84	33***
	Non-Interest Income	386	0.16	0.29	-0.54	2.25	234	-0.01	0.35	-1.37	0.91	6.59***
	Age	386	42.87	42.88	2.53	140.74	234	33.45	36.6	3.69	147.74	2.80***
Deal Characteristics	Price Asset Ratio	386	14.25	7.22	0.52	37.53	234	-14.9	8.92	-43.55	0.89	44***
	Deposit Premium						234	0.35	0.64	0	3.61	
	Asset Discount						234	-13.68	8.92	-43.55	0.14	
	Loss Share Value						119	-2.93	1.65	-7.93	-0.44	
	Number Bidders						230	2.9	1.67	1	8	
	Same County	386	0.10	0.29	0.00	1.00	234	0.09	0.29	0.00	1.00	0.25

† T-Stat.of mean equality test between FDIC-assisted and non-assisted acquisitions. ***, ** and * indicate significance at 1%, 5% and 10% respectively. See Table I for variable definitions.

Panel B. Acquirers

This panel presents general descriptive statistics for acquirers of FDIC-assisted and non-assisted deals over 2007:Q1 and 2016:Q3 period. Acquirers of non-assisted acquisitions are classified into two groups of banks: commercial banks and BHCs, whereas failed banks are sold merely to commercial banks.

	Acquirers of Non-Assisted Takeovers – Commercial Banks					Acquirers of Assisted Takeovers - Commercial Banks					
Variable	N	Mean	SD	Min	Max	N	Mean	SD	Min	Max	T-Stat
Acquirer Total Assets	32	532.4	649.2	63.44	2,937	187	3,312	6,063	23.29	31,374	-2.59**
Acquirer Relative Size	32	3.55	2.53	0.88	12.51	187	12.27	23.12	0.23	157	-2.13**
Acquirer Branch	32	11.72	9.61	1	35	187	72.97	120.79	1	572	-2.86***
Acquirer Tier 1 Ratio	32	14.69	4.87	9.02	34.86	187	14.82	5.95	8.33	41.2	-0.12
Acquirer Non-Performing Loans	32	0.99	0.95	0	3.11	187	3.4	3.11	0	14.03	-4.33***
Acquirer Inefficiency	32	72.58	18.34	35.86	116	187	67.77	21.06	23.48	161	1.21
Acquirer Labor Cost	32	40.24	9.87	17.12	62.23	187	34.30	11.33	9.29	77.16	2.80***
Acquirer Other Expenses	32	32.33	10.18	16.86	58.45	187	33.07	12.74	12.18	84.25	-0.31
Acquirer Employees	32	17.28	6.26	7.54	36.50	187	20.52	7.05	7.03	40.31	-2.44**
Acquirer Wage	32	25.02	6.49	10.50	36.30	187	17.46	4.84	10.50	36.30	7.74***
Acquirer CAMELS Score	32	2.06	0.9	1	4	187	1.6	0.69	1	4	3.69***
Acquirer Core Deposits	32	80.56	8.92	60.34	92.46	187	79.74	12.48	43.29	98.74	0.36
Acquirer Net Interest Margin	32	3.87	0.54	2.79	5.05	187	4.05	0.75	2.5	6.18	-1.30
Acquirer Non-Interest Income	32	7.8	5.46	1.57	21.07	187	21.21	15.45	-7.28	67	-4.85***
Acquirer Age	32	11.24	16.74	2.95	101	187	61.81	43.27	1.69	158	-6.52***
Acquisition Number	32	1.44	0.67	1	3	187	2.79	2.53	1	12	-3.00***
Acquisition Quarter	32	1	0	1	1	187	1.14	0.51	1	6	-1.59

	Acquirers of Non-Assisted Takeovers - BHCs				
Variable	N	Mean	SD	Min	Max
Acquirer Total Assets	160	8366	33,306	430	263,260
Relative Size	160	20.99	36.75	1.16	237
Acquirer Branch	160	89.16	106.17	1	543
Acquirer Tier 1 Ratio	160	13.94	3.7	8.1	27.92
Acquirer Non-Performing Loans	160	1.65	1.6	0.02	8.45
Acquirer Inefficiency	160	65.26	12.23	36.67	102
Acquirer Labor Cost	122	35.76	6.90	21.05	61.24
Acquirer Other Expenses	122	28.59	6.99	15.74	53.49
Acquirer Employees	122	19.60	5.58	10.23	33.75
Acquirer Wage	122	19.55	6.17	10.06	39.58
Acquirer CAMELS Score	0	.	.	.	.
Acquirer Core Deposits	160	74.21	10.44	36.41	91.46
Acquirer Net Interest Margin	160	3.87	0.62	2.44	5.64
Acquirer Non-Interest Income	160	21.25	11.81	2	64.24
Acquirer Age	160	21.55	14.29	0.64	94.12
Acquisition Number	160	1.51	0.77	1	4
Acquisition Quarter	160	1.02	0.14	1	2

† T-Stat.of mean equality test between FDIC-assisted and non-assisted acquisitions. ***, ** and * indicate significance at 1%, 5% and 10% respectively. See Table I for variable definitions.

Table III. Franchise Value Model - The Role of Acquirer Inefficiency

Panel A reports estimation of preferred specification of Equation (1) using OLS techniques and our pooled cross-section samples of assisted and non-assisted acquisitions during 2007:Q1-20176:Q3 period. In column (1), we estimate our model using data on non-assisted acquisitions. Column (2) reports estimation result using data on assisted acquisitions. In column (3), we limit the sample of assisted acquisitions to the deals without loss-share agreement. In columns (4) and (5) we examine assisted acquisitions and use *Asset Discount & Loss Share Value* and *Deposit Premium* as the dependent variable, respectively. Column (6) and (7) present estimation results, after inclusion of three financial indicators of acquirers, i.e. *Acquirer Tier 1 Ratio, Acquirer Non-Performing Loans* and *Acquirer Inefficiency*.

Panel B exhibits the Blinder-Oaxaca decomposition analysis. The analysis is conducted based on the estimations of preferred specification of Equation (1) for failed banks and healthy banks acquisitions, the results of them are presented in columns (1) and (2) of panel A. The first part of the table illustrates the mean predictions of *Price Asset Ratio* of healthy targets and failed banks and their differences. The second part of the table exhibits the decomposition of the gap between *Price Asset Ratio* of failed banks and healthy targets. The gap between the two groups is divided into three parts. The first part shows the man increase in the *Price Asset Ratio* of failed banks if they had the same characteristics as healthy targets. The second part reflects the change in failed banks' *Price Asset Ratio* when we use the coefficients of healthy target regression estimation to the failed banks characteristics. The third part shows the interaction term, which captures the simultaneous impact of differences in endowments and coefficients.

Panel A. Regression Estimation

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Non-Assisted Acquisitions	Assisted Acquisitions					
Variables	Price Asset Ratio	Price Asset Ratio		Asset Discount & Loss Share Value	Deposit Premium	Asset Discount & Loss Share Value	Deposit Premium
Core Deposits	0.077***	0.031	0.147	0.021	0.008**	0.022	0.007*
	(0.030)	(0.036)	(0.176)	(0.035)	(0.004)	(0.036)	(0.004)
Log_Branch	-0.068	1.854***	3.514**	1.844***	0.042	2.042***	-0.009
	(0.395)	(0.667)	(1.522)	(0.662)	(0.047)	(0.762)	(0.050)
Non-performing Loans	-0.528***	-0.010	0.224	-0.013	0.003	-0.020	0.002
	(0.091)	(0.079)	(0.174)	(0.079)	(0.005)	(0.082)	(0.005)
OREO	-0.854***	0.035	-0.241	0.030	0.007	0.054	0.009
	(0.268)	(0.092)	(0.296)	(0.092)	(0.008)	(0.099)	(0.008)
Commercial Mortgage	-0.020	-0.051	-0.155**	-0.049	-0.002	-0.042	-0.002
	(0.019)	(0.047)	(0.075)	(0.047)	(0.003)	(0.049)	(0.002)
Liquid Assets	-0.025	0.331***	0.407***	0.321***	0.010	0.331***	0.010
	(0.023)	(0.058)	(0.131)	(0.056)	(0.007)	(0.059)	(0.007)
Noninterest Income	-1.320	-0.740	2.942	-0.824	0.144	-0.905	0.181
	(0.972)	(1.811)	(4.665)	(1.755)	(0.134)	(1.601)	(0.132)
Inefficiency	0.884	-2.400	-2.033	-2.354	-0.091	-2.276	-0.062
	(0.871)	(1.471)	(2.431)	(1.441)	(0.105)	(1.471)	(0.102)
Market Share	0.639***	1.161	7.575	1.081	0.101	0.122	0.248*
	(0.235)	(1.081)	(9.605)	(1.093)	(0.139)	(1.322)	(0.145)
Acquirer Tier 1 Ratio						-0.070	0.013**
						(0.077)	(0.006)
Acquirer Non-performing Loans						0.179	-0.009
						(0.145)	(0.011)
Acquirer Inefficiency						-0.054**	-0.005***
						(0.026)	(0.002)
Year 2008	-4.100**	16.063***	14.762**	15.182***	0.418	12.923***	0.391
	(1.600)	(2.964)	(6.880)	(2.664)	(0.274)	(3.036)	(0.278)
Year 2009	-6.936***	1.052	1.972	0.376	0.801***	-0.322	0.772***
	(1.963)	(2.230)	(5.348)	(2.154)	(0.259)	(2.330)	(0.270)
Year 2010	-7.593***	1.391	2.055	1.034	0.461***	0.441	0.428**
	(1.425)	(1.747)	(4.329)	(1.716)	(0.176)	(1.857)	(0.197)
Year 2011	-8.173***	-3.133*	-4.654	-3.252*	0.167	-4.243**	0.142
	(1.323)	(1.727)	(3.586)	(1.711)	(0.147)	(1.987)	(0.163)
Year 2012	-8.968***	-3.618	-6.158	-3.770*	0.219	-5.065**	0.155
	(1.245)	(2.203)	(4.785)	(2.167)	(0.184)	(2.191)	(0.192)
Year 2013	-7.825***	5.534***	7.102*	5.321***	0.306	6.041***	0.334
	(1.305)	(1.882)	(3.941)	(1.790)	(0.217)	(1.902)	(0.216)

Year 2014	-9.144***	-0.660	3.713	-0.832	0.255	-1.467	0.297
	(1.170)	(4.694)	(5.970)	(4.728)	(0.313)	(5.012)	(0.310)
Year 2015	-6.922***	5.271**	9.253**	4.360**	1.067	2.744	0.103
	(1.138)	(2.240)	(3.743)	(1.872)	(0.801)	(2.125)	(0.165)
Year 2016	-6.773***	1.517	2.003	1.731	-0.161	1.061	-0.137
	(1.353)	(3.075)	(5.106)	(3.016)	(0.125)	(3.215)	(0.119)
Constant	16.86***	-22.78***	-38.26**	-21.66***	-0.977*	-17.59***	-0.708
	(2.814)	(5.757)	(17.645)	(5.598)	(0.591)	(6.297)	(0.622)
Observations	370	234	79	234	234	214	214
R-squared	0.404	0.291	0.473	0.290	0.117	0.317	0.147

Panel B. Blinder-Oaxaca Decomposition			
Differentials	Mean Prediction – Non-Assisted Acquisitions	14.21***	
		(0.38)	
	Mean Prediction – Assisted Acquisitions		-14.90***
			(0.6)
	Difference		29.11***
			(0.71)
Decompositions	Endowments		6.04***
			(1.81)
	Coefficients		14.88***
			(1.51)
	Interaction		8.19***
			(2.28)

See table I for variable definitions. Robust standard errors in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

Table IV. Franchise Value Model – Acquirer's Inefficiency Decomposition

This table reports estimation of preferred specification of Equation (1) after including *Acquirer Tier 1 Ratio* and *Acquirer Non-Performing Loans*. We use OLS techniques and our pooled cross-section sample of assisted acquisitions during 2007:Q1-20176:Q3 period. Year fixed effects are controlled for in the model, and the F-test shows that the coefficients are jointly significant; nevertheless, for brevity, the coefficients are not reported in the table.

We use *Asset Discount & Loss Share Value* as the dependent variable in columns (1) & (2) and (5) & (6). *Deposit Premium* is our dependent variable in columns (3) & (4) and (7) to (9). Instead of *Acquirer Inefficiency*, we include *Acquirer Labor Cost* in columns (1) and (3) and *Acquirer Other Expenses* in columns (2) and (4). We use *Acquirer Employees Acquirer Inefficiency* in columns (5) and (7), and *Acquirer Wage* in columns (6) and (8). Lastly, column (9) reports the estimation result when we add *Acquirer Log_Branch* to our specification in column (7).

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Variables	Asset Discount & Loss Share Value		Deposit Premium		Asset Discount & Loss Share Value		Deposit Premium		
Core Deposits	0.020	0.027	0.007*	0.008*	0.023	0.029	0.008*	0.008*	0.008*
	(0.035)	(0.036)	(0.004)	(0.004)	(0.036)	(0.037)	(0.004)	(0.004)	(0.004)
Log_Branch	1.983**	2.125***	-0.012	-0.004	2.076***	2.200***	-0.007	0.005	-0.009
	(0.763)	(0.766)	(0.051)	(0.050)	(0.779)	(0.768)	(0.049)	(0.051)	(0.051)
Non-performing Loans	-0.023	-0.012	0.002	0.003	-0.017	-0.004	0.002	0.004	0.002
	(0.082)	(0.083)	(0.005)	(0.005)	(0.081)	(0.083)	(0.005)	(0.005)	(0.005)
OREO	0.065	0.048	0.010	0.008	0.057	0.052	0.009	0.009	0.009
	(0.098)	(0.100)	(0.008)	(0.008)	(0.100)	(0.101)	(0.008)	(0.008)	(0.008)
Commercial Mortgage	-0.044	-0.044	-0.002	-0.002	-0.048	-0.048	-0.002	-0.002	-0.003
	(0.049)	(0.050)	(0.002)	(0.002)	(0.050)	(0.051)	(0.002)	(0.002)	(0.003)
Liquid Asset	0.336***	0.330***	0.011	0.010	0.329***	0.332***	0.010	0.011	0.010
	(0.059)	(0.060)	(0.007)	(0.007)	(0.059)	(0.060)	(0.007)	(0.007)	(0.007)
Noninterest Income	-0.917	-0.854	0.182	0.183	-0.801	-0.775	0.190	0.193	0.189
	(1.594)	(1.662)	(0.131)	(0.135)	(1.642)	(1.724)	(0.132)	(0.138)	(0.132)
Inefficiency	-2.209	-2.359	-0.058	-0.069	-2.436	-2.380	-0.077	-0.071	-0.072
	(1.468)	(1.495)	(0.103)	(0.104)	(1.494)	(1.511)	(0.107)	(0.107)	(0.107)
Market Share	-0.064	0.159	0.231	0.258*	-0.093	-0.047	0.227	0.232	0.224
	(1.346)	(1.317)	(0.147)	(0.143)	(1.337)	(1.324)	(0.147)	(0.146)	(0.148)
Acquirer Tier 1 Ratio	-0.066	-0.089	0.013**	0.012**	-0.086	-0.111	0.012**	0.010	0.012**
	(0.078)	(0.077)	(0.006)	(0.006)	(0.081)	(0.080)	(0.006)	(0.006)	(0.006)
Acquirer Nonperforming Loans	0.120	0.215	-0.013	-0.005	0.194	0.209	-0.007	-0.006	-0.008
	(0.149)	(0.148)	(0.012)	(0.010)	(0.146)	(0.151)	(0.011)	(0.012)	(0.011)
Acquirer Labor Cost	-0.120**		-0.009**						
	(0.053)		(0.004)						
Acquirer Other Expenses		-0.053		-0.007**					
		(0.044)		(0.003)					
Acquirer Employees					-0.125		-0.012**		-0.012**
					(0.080)		(0.005)		(0.006)
Acquirer Wage						0.011		0.001	
						(0.159)		(0.010)	
Acquirer Log_Branch									0.007
									(0.026)
Constant	-18.149***	-19.371***	-0.817	-0.783	-19.563***	-22.236***	-0.875	-1.129*	-0.901
	(6.062)	(6.493)	(0.601)	(0.650)	(6.111)	(6.900)	(0.615)	(0.633)	(0.593)
Year Dummy Variables	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	214	214	214	214	214	214	214	214	214
R-squared	0.322	0.310	0.147	0.140	0.313	0.305	0.142	0.126	0.142

See table I for variable definitions. Robust standard errors in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

Table V. Franchise Value Model – The Role of Competition

This table reports estimation of preferred specification of Equation (1) after including two financial indicators of acquirers, i.e. *Acquirer Tier 1 Ratio* and *Acquirer Non-Performing Loans,* and *Acquirer Employees*. In addition, we include *Number Bidders* to our model. We use OLS techniques and our pooled cross-section sample of assisted acquisitions during 2007:Q1-20176:Q3 period. We use *Asset Discount & Loss Share Value* and *Deposit Premium* as the dependent variable in columns (1) and (2), respectively. Year fixed effects are controlled for in the model, and the F-test shows that the coefficients are jointly significant; nevertheless, for brevity, the coefficients are not reported in the table.

	(1)	(2)
Variables	Asset Discount & Loss Share Value	Deposit Premium
Core Deposits	0.007	0.007*
	(0.036)	(0.004)
Log_Branch	2.162***	-0.010
	(0.774)	(0.048)
Non-performing Loans	-0.007	0.002
	(0.079)	(0.005)
OREO	0.055	0.009
	(0.100)	(0.008)
Commercial Mortgage	-0.049	-0.002
	(0.047)	(0.002)
Liquid Asset	0.290***	0.008
	(0.057)	(0.006)
Noninterest Income	-1.087	0.213*
	(1.668)	(0.127)
Inefficiency	-1.989	-0.044
	(1.499)	(0.101)
Market Share	-0.901	0.214
	(1.299)	(0.136)
Acquirer Tier 1 Ratio	-0.112	0.011*
	(0.081)	(0.006)
Acquirer Non-performing Loans	0.230	0.002
	(0.154)	(0.011)
Acquirer Employee	-0.113	-0.012**
	(0.078)	(0.005)
Number Bidders	1.224***	0.101**
	(0.394)	(0.041)
Constant	-19.982***	-1.118**
	(5.779)	(0.528)
Year Dummy Variables	Yes	Yes
Observations	210	210
R-squared	0.326	0.200

See table I for variable definitions. Robust standard errors in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

Table VI. Financial Strength and Probability of Acquiring a Failed Bank

This table reports estimation of Equation (2) using logit techniques. In column (1), we study our sample of acquirers which are commercial banks with 214 observations on the FDIC-assisted and 32 observations on non-assisted acquisitions. In column (2), we limit the sample of assisted acquisitions to 117 deals where at least 3 bidders attend the auction. Year fixed effects are controlled for in the model, and the F-test shows that the coefficients are jointly significant; nevertheless, for brevity, the coefficients are not reported in the table.

	(1)	(2)	(3)	(4)
	Whole Sample		At least 3 acquirers attended the FDIC Auctions	
Variables	Coefficients	Marginal Effects	Coefficients	Marginal Effects
Acquirer Relative Size	0.316*	0.010	0.726**	0.020
	(0.182)		(0.298)	
Acquirer Tier 1 Ratio	0.058	0.002	0.161	0.004
	(0.084)		(0.106)	
Acquirer Non-performing Loans	0.797**	0.024	1.487***	0.041
	(0.358)		(0.393)	
Acquirer Inefficiency	0.076**	0.002	0.223***	0.006
	(0.030)		(0.054)	
Acquirer CAMELS Score	-1.930**	-0.058	-5.812***	-0.159
	(0.933)		(2.105)	
Acquirer Core Deposits	-0.093	-0.003	-0.055	-0.002
	(0.088)		(0.056)	
Acquirer Net Interest Margin	0.678	0.020	0.389	0.011
	(0.766)		(0.741)	
Acquirer Noninterest Income	0.105***	0.003	0.186***	0.005
	(0.036)		(0.048)	
Acquirer Age	0.080***	0.002	0.200***	0.005
	(0.029)		(0.043)	
Constant	4.386		-15.569*	
	(4.609)		(7.974)	
Year Dummy Variables	Yes		Yes	
Observations	246		149	
Pseudo R-Squared	0.740		0.824	
Log-Likelihood	-24.71		-13.61	

See table I for variable definitions. Robust standard errors in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.

Table VII. Financial Strength and Probability of Multiple Acquisitions

This table reports estimation of Equation (2), using logit techniques. We use the sample of observations on commercial banks that acquire failed banks through the FDIC-assisted acquisitions. In columns (1) and (2), We use the dummy variable for multiple takeovers during the study period, i.e. 2007:Q1-2016:Q3, as the dependent variable. In columns (3) and (4), the dependent variable is the dummy variable for multiple takeovers in a given quarter. Year fixed effects are controlled for in the model, and the F-test shows that the coefficients are jointly significant; nevertheless, for brevity, the coefficients are not reported in the table.

	(1)	(2)	(3)	(4)
	Multiple takeovers during the study period		Multiple takeovers in a given quarter	
Variables	Coefficients	Marginal Effects at the Mean	Coefficients	Marginal Effects at the Mean
Relative Size	0.032***	0.006	0.023	0.002
	(0.012)		(0.021)	
Acquirer Tier 1 Ratio	0.030	0.006	0.105***	0.010
	(0.037)		(0.040)	
Acquirer Non-performing Loans	0.173**	0.034	0.081	0.007
	(0.070)		(0.070)	
Acquirer Inefficiency	0.004	0.001	0.003	0.000
	(0.011)		(0.017)	
Acquirer CAMELS Score	-0.219	-0.044	-0.125	-0.011
	(0.305)		(0.516)	
Acquirer Core Deposits	0.020	0.004	0.016	0.001
	(0.018)		(0.023)	
Acquirer Net Interest Margin	0.528**	0.105	0.173	0.016
	(0.269)		(0.398)	
Acquirer Noninterest Income	0.028**	0.006	0.010	0.001
	(0.013)		(0.014)	
Acquirer Age	-0.007*	-0.001	-0.001	-0.000
	(0.004)		(0.007)	
Constant	7.574***		-18.602***	
	(2.365)		(3.177)	
Year Dummy Variables	Yes		Yes	
Observations	183		167	
Pseudo R-Squared	0.154		0.142	
Log-Likelihood	-106.3		-52.51	

See table I for variable definitions. Robust standard errors in parentheses. ***, ** and * indicate significance at 1%, 5% and 10%, respectively.