

The Determinants and Effects of the Discount in the FDIC-Assisted Failed Bank Acquisitions

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Abstract

During the recent financial crisis, the Federal Deposit Insurance Corporation (the FDIC) auctioned most of the failed banks. A distinguishing character of these failed bank auctions is that the failed banks are sold at discount from the most recent quarter valuation of their reported asset value. A second distinguishing feature of these auctions is that acquirers of these failed banks have frequently reported bargain purchase gain (BPG) compared to regular mergers during the same period. Based on a unique sample of the FDIC-assisted whole-bank transactions in the recent financial crisis, we measure discount using accounting information, investigate what factors lead to larger discount and larger reporting of BPGs, and further examine the effects of discount on the post-merger performance of the acquiring institutions. Consistent with prior literature, we identify bidding competitiveness and loss sharing agreement as significant determinants. However, DIF reserve ratio, the proxy for the financial condition of the FDIC and relative size between the failed bank and the acquirer, are not found to have significant and consistent relation with discount. As expected, we document that discount can inflate the post-merger profitability of acquirers. Overall, our study provides insights about the intrinsic connection between the discount determinants and the features of the FDIC-assisted failed bank resolution.

Keywords: bank failures, discount, bargain purchase gain, post-merger performance

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1. Introduction

The most recent financial crisis witnessed another tide of bank failures since the last failure wave during early 1980s and early 1990s (see Figure B.1). According Federal Deposit Insurance Corporation (the FDIC), 463 out of 489 failed banks were resolved by purchase and assumption (P&A) transactions (see Figure B.2). In a P&A transaction, a selected pool of potential bidders are invited by the FDIC to participate in a sealed-bid auction and the winning bidder purchases part of or all assets and assumes part of or all liabilities of the failing bank. The winning bid is chosen on a least-cost basis for the Deposit Insurance Fund (DIF).

INSERT FIGURE B.1 AND FIGURE B.2 HERE

Besides the features such as less competitive bidding environment, the special roles of the FDIC as both insurer and partner, and the limited time structure of resolution process, the FDIC-assisted P&A auction is characterized as acquiring institution buying failed banks at a discount in most cases¹, in contrast to the overpayment in a regular bank or corporate merger. A predominant explanation of overpayment in regular merger is explained by ‘winner’s curse’, which states that the winning bidder in a sealed-bid auction tends to be the one most overestimating the intrinsic value of the auctioned object, thus being “cursed” in a way of paying more than the target worth.

The source and effect of the unique “discount” phenomenon in the FDIC-assisted failed bank resolution is the focus of our study. Our primary objectives are to measure the magnitude of discount, investigate how the discount is determined, and examine its effect on the post-merger

¹ In our sample, discount happens in 95.96% of the whole-bank P&A transaction.

performance of the acquirers. Our sample consists of 99 whole-bank P&A transactions from the fourth quarter of 2009 to the first quarter of 2013².

In our study, the definition of discount³ is the difference between the transaction price and the fair value of the failed bank at the time of the merger. The estimation of discount is based on the equity value of the failed bank at the time of merger based on accounting information, with adjustments of deposit premium, asset discounts (or premium in some cases), we also recalculate discount using bank equity capital two quarters prior to the failure for robustness. We report an average discount relative to the failed bank total liabilities of 15.13% by method 1 and 16.57% by method 2.

We analyse what determines discount in a failed bank merger. We propose that if the abnormal return is associated with discount or wealth transfer, as implied in the prior literatures (James and Wier 1987, Bertin, Ghanzanfari and Torbzadeh 1989, Cochrane, Rose and Fraser 1995, Zhang 1997, Cowan and Salotti 2015), we expect that some of those factors also impact discount. Factors of interest in our study include financial condition of the FDIC, bidding competitiveness, relative size of the failed bank to the acquirer, the usage of loss sharing agreement. Geographic factors are used as control variables, including whether the failed bank and the acquirer are located in the same city (or state) and the unemployment rate of the state where the failed bank is located.

Christoffersen et al. (2012) argues that the financial pressure of the FDIC signaled by the large outflows of DIF contributes to large and long-lasting abnormal returns for the acquirer around the merger announcement. Using DIF reserve ratio as the proxy for the financial condition of the FDIC, we fail to find empirical evidence of the connection between the financial stress of the FDIC and the discount offered by the FDIC to the acquirer.

Bidding competitiveness, indicated by number of bids, is found to negatively impact discount. A series of literatures document that bidding competitiveness makes a difference in post-merger abnormal returns (James and Weir 1987a/1987b, Gupta et al. 1997, Stover 1997, Christoffersen et al. 2012). Our results show that less bidding competitiveness leads to higher discount, and it

² Our sample is different from previous studies that did not distinguish between partial and the whole-bank P&A transactions.

³ In some rare cases, we observe a premium rather than discount.

explains the significant discounts observed in our sample to some extent. The results for bidding competitiveness remains consistent in all robustness tests, except in robustness test 3 where bidding competitiveness shows no significance for the second sub-period. The significant results for bidding competitiveness may be explained by the fact that our sample covers the period of an industry-wide crisis, resulting in a less competitive bidding environment. Additionally, the screening for qualified participants in the closed-form auction further limits bidding competitiveness.

Size is an important factor in merger since larger target size may result in higher synergy, economies of scale and lower transaction costs. However, larger target during financial crisis may also become problematic to resolve for the FDIC and unaffordable for survivor banks. The relative size turns out to be significantly and positively related to discount level, consistent with Christoffersen et al. (2012). However, after excluding extreme cases in which the relative size is larger than or equal to two, we do not find significant relationship between relative size and discount.

Besides calculating discount directly from accounting information, we also use bargaining purchase gain (BPG) reported by the acquiring institutions to indirectly reflect discount. Under the current accounting standard, BPG is required to be reported in income statement within one year after a merger, in which the target is sold at a price less than its fair value. We document that the acquirers in the FDIC-assisted acquisitions on average not only report higher BPGs than the acquirers in the non-FDIC-assisted acquisitions but also report BPGs more frequently. In our empirical analysis of the determinant of the BPG, we find that only bidding competitiveness, among the earlier tested factors turns out to be significant. In addition, our findings from the FDIC-assisted-merger sample do not support Dunn et al. (2015), which argues that acquirers experiencing earnings decline are more likely to report BPGs.

Finally, we examine the effect of discount on the post-merger profitability improvements of the acquirer. We find that larger discount is associated with short-term profitability improvements after the merger. The reason for us to focus on profitability improvement is that it may arise from post-merger synergy effect or underestimation of assets (equity). An acquirer who over-discounts the assets of failed bank creates artificially inflated profitability indicators (return on assets and return on equity) since the denominators are underestimated.

The remainder of this paper is organized as follows. Chapter 2 provides the previous literatures of the FDIC-assisted failed bank. Chapter 3 describes the development of our hypotheses. In chapter 4, we discuss our methods of measuring discounts and our empirical approaches to analyze the determinants and effects of discount. Chapter 5 presents the sources, filtering process and features of our data and variables. Chapter 6 shows our empirical results. Finally, chapter 7 concludes.

2. Literature Review

2.1 FDIC Failed Banks Resolution

The involvement of the FDIC has made the FDIC-assisted mergers and acquisitions unique in terms of both resolution process and the special post-merger arrangements. In spite of the changes of the precise resolution manner over time, the basic contour has remained constant since the foundation of FDIC, according to Chritofferson et al. (2012).

Regulatory Background

Aiming to improve the safety and soundness of both the banking and thrift industries, the FDIC Improvement Act of 1991 (FDICIA) requires the least-cost resolution of insured depository institutions, enhanced supervision and examinations of insured institutions and additional resources to the Bank Insurance Fund⁴.

Before 1991, the FDIC could choose any resolution transaction less costly than a deposit payoff while taking the effects of other resolution methods into account. After the pass of FDICIA in 1991, the FDIC amended its failure resolution procedures to accept the “least cost” bid. The least cost procedures require the FDIC to choose the resolution method in which the total amount of the FDIC’s expenditures and liabilities incurred (including any immediate or long-term obligation and any direct or contingent liability) has the lowest cost to the DIF, regardless of other factors⁵.

Another main overarching provision of FDICIA is “prompt corrective action”, which requires federal banking agencies to take progressively severe, corrective, supervisory actions as a bank’s capital condition deteriorates. The failing banks can either re-capitalize or voluntarily arrange a merger with another bank.

⁴ Source: <https://www.fdic.gov/regulations/laws/rules/8000-2400.html>

⁵ The only exception is if there is a finding of “systemic” problems affecting the financial marketplace.

Shortly after FDICIA, the Riegle Neal Interstate Banking and Branching Efficiency Act of 1994 (RNIBBEA) further exerted important influence on banking industry. RNIBBEA removed the legal barriers for bank holding companies to branch across state lines, resulting in massive consolidation and concentration in banking industry over the past 20 years. Prior to the RNIBBEA, the Douglas Amendment to the Bank Holding Company Act of 1956 prohibited the interstate acquisition unless specifically authorized by the laws of the state where the target bank was located.

Failed Bank Resolution Process

Under FDICIA and other current laws, once a bank is determined by the chartering agency to be insolvent, critically undercapitalized, or unable to meet deposit outflows, the failing bank is allowed 90 days to take prompt corrective actions. Failing to recapitalize or find a suitable buyer within the 90-day period leads to a formal resolution process by the FDIC.

There are three basic resolution methods for FDIC when facing failed and failing institutions: deposit payoff, open bank assistance (OBA) agreement, and purchase assumption (P&A) agreement. On rare occasions, the FDIC pays off the full amount of the insured deposits within the insurance limit⁶ or provides financial assistance⁷ to an operating insured bank determined to be in danger of closing, known as deposit payoff and OBA⁸, respectively. The P&A agreement is a closed bank transaction in which a healthy institution (the acquirer) purchases some or all of the assets of a failed bank and assumes some or all of the liabilities, including all insured deposits⁹. The acquirer usually pays a premium for the assumed deposits and/or receives a discount on the

⁶ The Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010 permanently increased the deposit insurance into \$250,000 from \$100,000 per depositor for each account ownership category.

⁷ Financial assistance of FDIC includes making loan to, purchasing the assets of, or placing deposits in the troubled bank. This method has not been used since 1992.

⁸ OBA is in the forms of direct loans, contributions, deposits, asset purchases, or the assumption of liabilities. Dodd-Frank Wall Street Reform and Consumer Protection Act in 2010 eliminated this option.

⁹ The definition and the process of P&A agreement are based on: Chapter 2, Managing the Crisis: The FDIC and RTC Experience, <https://www.fdic.gov/bank/historical/managing/history1-02.pdf>

assets purchased. During the recent financial crisis, the vast majority of failed banks were resolved by P&A agreement.

Before the P&A transaction, the FDIC performs a series of task, including processing the failing bank letter sent by the chartering agency, developing an information package for potential bidders, performing an asset valuation calculating the cost of a deposit payoff, determining the appropriate resolution structure, conducting an on-site analysis and selecting the eligible bidders based on specific factors¹⁰. After getting the information package distributed on an information session and signing a confidentiality agreement, the eligible bidders do their own due diligence and interested bidders submit bids in a sealed-bid auction. A bid has three parts: a bid on deposits, a bid on the assets, and whether they bid on all the deposits or only insured deposits. The winning bid is selected under the principle of least cost. Cash is the only acceptable payment method. The entire process of the auction should be kept confidential by all parties until the FDIC officially makes the announcement. The disclosed bid summary includes the name as well as the bid amount of the winning bidder and those of the losing bidders, but in a manner that de-links losing bidders' names from their bid amounts. The losing bids are disclosed days or weeks after the announcement of the winning bid, while the cover bid (the second highest bid) is disclosed one year after¹¹.

Resolution Costs for the FDIC

FDICIA of 1991 requires the FDIC to select the least-cost resolution method to the DIF. Factors influencing the cost of resolving failed banks to the FDIC have drawn attention of researchers since then. James (1991) documented substantial direct costs associated with bank failure (10 percent of the failed bank assets), which is proven to be larger than the direct costs of nonfinancial firms bankruptcy. In addition, whole bank transactions, in which case all of a failed bank's assets are sold to the acquirers, can significantly reduce losses since results show that more volume of assets assumed by the purchaser leads to significantly less losses on failed bank assets. Exploring the relationship between the reporting requirements of the failed bank and the

¹⁰ Factors taken into consideration include: geographic location, competitive environment, asset size, capital level, ratings, and overall financial condition. Eligible bidders must be approved by their regulators to bid on the failed bank.

¹¹ Source: <https://www.fdic.gov/about/freedom/biddocs.html>

outcomes of the auction, Granja (2013) found evidence that stricter disclosure requirements corresponds to lower estimated costs of closing a bank and higher percentage of assets sold in the auctions. Using a longer-period sample from 1986 to 2007, Bennett and Unal (2015) demonstrated that the resolution costs differ among different methods of resolution, bank size, and regulatory periods. More specifically, P&A transactions are proven to cost more during crisis period than non-crisis period. The authors also find some components of resolution costs as well as the total costs have an inverse relationship with failed bank size.

The effect of FDICIA on cost reduction of bank failures is examined by some recent papers, which show that FDICIA has been working successfully before the pre-2008 period. Bennett and Unal (2014, 2015) found that costs of private-sector reorganizations are significantly higher, compared to the costs of FDIC liquidations, in the banking crisis period of 1986 – 1991. But when focusing on the post-crisis period of 1992 – 2007, they found that private-sector reorganizations are inherently more cost effective than FDIC liquidation after controlling for the selection bias embedded in the resolution process. Besides the effect on resolution costs of failed banks, FDICIA is found to make supervisory interventions more effective at banks (Kane et al. 2008), and to improve the quality of bank financial reporting (Altamuro and Beatty 2010).

Loss Sharing Arrangement¹²

Loss sharing is a feature that the FDIC first introduced into selected P&A transactions in 1991. The original goals were to (1) sell as many assets as possible to the acquiring bank and (2) have the nonperforming assets managed and collected by the acquiring bank in a manner that aligned the interests and incentives of the acquiring bank and the FDIC. Loss sharing applies to two categories of bank assets, commercial assets and residential mortgages.

Under loss sharing, the FDIC agrees to absorb a significant portion of the loss – typically 80% - on a specified pool of assets while offering even greater loss protection in the event of financial catastrophe, and the acquiring bank is liable for the remaining portion of the loss. On occasion of

¹² This section is based on FDIC document: <https://www.fdic.gov/bank/historical/managing/history1-07.pdf>

recoveries on assets that have been charged off by the failed bank or the acquirer, the FDIC will gain 80% of the benefit while the acquiring bank gains the 20%. Before March 26, 2010, loss sharing is allowed to be on a 95/5 basis when the losses exceeded an established threshold defined in loss sharing agreement. The loss sharing agreement stipulates what the assuming institution can and cannot do with the acquired loans. For example, the acquirer can only sell the acquired loans after a certain period of time and even then only with the FDIC's approval.

The loss sharing is favorable for the following reasons. Firstly, it helps the FDIC minimize outlays and reduce immediate funding needs. Secondly, it keeps assets in the private sector instead of under government management. From the perspective of the acquirers, loss sharing protects the acquiring banks from losses. Most importantly, it helps local consumers and businesses by keeping the assets of the failed bank in the community, preserving banking relationships for customers who have both deposits and loans in the failed bank. On the other hand, the disadvantages lie in the facts that loss sharing requires additional administrative duties for both the acquirer and the FDIC and that it's time-consuming as agreements generally last 8 to 10 years¹³.

The loss sharing agreement is bundled with the auctioned assets rather than priced separately. Given the insurance function of loss sharing, it encourages acquirers to bid higher and accept lower discount on failed bank assets. If the loss sharing agreement is underpriced, there will be more interested potential buyers. Therefore, one way that the FDIC could subsidize the acquirer is by underpricing the loss sharing agreement.

Bargain Purchase Gain

Issued by the Financial Accounting Standards Board (FASB) in December 2007, a revised standard of accounting and reporting in business combinations requires the Bargain Purchase Gains (BPGs), previously known as "negative goodwill", to be reported within income statement

¹³ For commercial assets, the loss sharing agreement covers an eight-year period with the first five years for losses and recoveries and the final three years for recoveries only. For single-family mortgages, the loss sharing agreement is for ten years.

Source: FDIC website – Industry Analysis – Failed Banks – Loss-share Questions and Answers

from continuing operations, effective from January 1, 2009¹⁴. A bargain purchase occurs when the price paid by the acquiring institution is lower than the fair value of the failed bank and it “might happen in a business combination that is a forced sale in which the seller is acting under compulsion” (FASB 2007, para. 37). Before a P&A auction, very limited information about the failing bank is revealed in the information package distributed by the FDIC to potential bidders. Furthermore, the whole resolution process takes about 90 days and the time period from the FDIC contacting potential bidders to the completion of the transaction only lasts about 8 weeks according to Dunn et al. (2015), hence bidders may not obtain all necessary information to accurately were allowed to write down the amount of negative goodwill on a pro-rata basis to designated asset classes, with the residual negative goodwill recorded as an extraordinary gain. By comparison, the impact of the accounting revision is apparently a boost in earnings and thus retained earnings. The new standard requires the price difference to be recognized as a gain in earnings within the 12 months after the acquisition time.

Designed to “improve the representational faithfulness and completeness of the information provided about the acquirers earnings during the period in which it makes a bargain purchase”, acknowledged in FASB (2007), the revised standard is found to reveal favorable results empirically. Using a sample of 142 FDIC-assisted bank acquisitions during 2009 and 2010, Dunn, Kohlbeck and Smith (2015) reports that BPG is used by firms to prevent losses and earning/return on assets declines, which provides a contemporaneous opportunity of earnings management. More specifically, evidences show that public banks with pre-acquisition earnings declines are more likely to report a BPG; in contrast, the results for their non-public counterparts turn out to be insignificant. Another important finding is that the 5-day cumulative abnormal return for acquisitions with BPG announced is on average 4.53%, compared with 0.02% for acquisitions with no BPG announced. Further, the cumulative abnormal return, found to be less persistent, is identified as a transitory component of current income. However, an earlier study by Comiskey, Clarke, and Mulford (2010) failed to document that negative goodwill is valued by the market. Their sample consists of 43 acquisitions with negative goodwill during 2000 and 2007, including companies from different industries.

¹⁴ Source: FASB ASC 850-30-25-2

2.2 Market Reaction to Failed Bank Acquirers and Corresponding Reasons

Negative Abnormal Returns - Overbidding / Winner's Curse Theory

A few papers in 1980s found negative abnormal returns of the acquirers, suggesting the existence of overbidding behavior in FDIC failed bank auctions. Pettway and Trifts (1985) documented that the market for failed banks is competitive and the acquiring banks may have bid more than the competitive price, since there was significant decline in abnormal return.

Examining the effects of bidder competition within the context of FDIC auctions of failed banks, Giliberto and Varaiya (1989) found supportive evidence of winner's curse. This finding contradicts the critical prediction regarding optimal bidder behavior in common value models. However, their results are consistent with optimal bidder behavior if P&A transactions are Independent private values (IPV) auctions.

Positive Abnormal Returns - Underbidding/ Wealth Transfer Effect

Another stream of the empirical studies show positive abnormal returns of the purchasers, supporting the hypothesis of underbidding behavior of bidders, that is, the FDIC winners on average pay less for failed bank assets than they worth. Underbidding allows the acquirers to expropriate wealth from the FDIC and it hinders the identification of the sources of positive abnormal returns.

As one of the early researches in this field, James and Wier (1987b) tested wealth transfers hypothesis by examining the returns to winning bidders in FDIC auctions. They found positive abnormal returns to winning bidders and, more importantly, a negative and significant relation between the returns to winning bidders and the number of bidders participating in the auction, which suggests that the FDIC's auction procedures generate wealth transfers from the FDIC to the acquiring banks.

Besides the procedures of the FDIC P&A auction, another macro-economic factor is the changing banking environment. Using the sample from 1982 to 1987, Bertin et al. (1989) reported that acquiring banks capture significant positive abnormal returns over the period just

prior to and including the failure/merger announcement date, implying that underbidding is being practiced by successful acquirers. The authors attributed the result to the rapidly-changing banking environment of the 1980s. The sharp increase in bank failures, which resulted from factors like banking deregulation, high and volatile interest rates and poor lending practices, caused the failed bank auction participants to be more conservative in their bidding practices. In another aspect, the bargaining power of bidders has become stronger due to the increased supply of failed banks auctioned by the FDIC and the restrictions in the FDIC's sealed bid invitations. Moreover, regulatory factors such as the removal of some restrictions on intrastate and interstate branching have provided banks with more expansion alternatives, thereby reducing the attractiveness of failed bank acquisitions.

Furthermore, some studies focused on the three parties involving in P&A transactions, the failed bank, the acquirer and the FDIC. From the respect of the failed bank, Cochran et al. (1995) showed that acquiring banks' undertaking large failed bank transactions experienced large wealth transfers. The authors claimed that the excess returns are not driven by scale or scope economies, but may be explained by the synergy hypothesis and over subsidization hypothesis.

From the aspect of the acquirer, the experience and ability of the acquirer significantly impact the abnormal returns. Bertin et al. (1989) argued that the increase in FDIC auctions enabled the bidding banks to improve their expertise in evaluating failed targets. This experience effect is also documented by Zhang (1997), which reported that significant cumulative abnormal returns of the FDIC-assisted acquisitions are driven by repeated acquirers, who improved its profiting chances by reducing the winning bid and the number of bids. In addition, Cowan and Salotti (2015) reported that the acquirer stock-price reaction is a decreasing function of its bid, which is further a decreasing function of the ability of healthy banks.

From the aspect of the FDIC, Christoffersen et al. (2012) tested the hypothesis that the financial health of the FDIC limits its ability to efficiently resolve failed banks using a far larger sample than available in previous studies and found that acquirers experience large and long-lasting abnormal returns around the announcement of a failed bank acquisition when the DIF is experiencing large outflows, after remove the possible effects of positive information or changes in the competitiveness of bidding.

Positive Abnormal Returns - Synergy Effect

The significant positive post-merger abnormal returns can also be explained by synergy effect, arising from improvement of operating efficiency and profitability performance. A number of studies have been conducted and results are significant both statistically and economically.

Empirical studies have found that operating efficiency improvement, such as cost reduction and employee productivity enhancement, makes up a major part of the positive abnormal returns. Cornett and Tehranian (1992) found supportive evidence showing that the improvement in cash flow performance is due to enhanced ability to attract loans and deposits, optimized employee productivity and improved asset growth. Expectation of these factors is reflected in the post-merger stock price. Focusing on the mergers and acquisitions in the European Union financial industry during the period 1998-2002, Campa and Hernando (2006) failed to find significantly different from zero excess returns of the acquiring banks but this paper found significant improvements in the acquiring bank performance beginning on average 2 years after the transaction was completed. Moreover, the target firms experience improvement in return on equity and efficiency. Going one step further, Houston et al. (2001) identified that cost savings contribute even more than revenue enhancement to the value creation, based on a sample of the largest bank mergers between 1985 and 1996.

More often, improvements in profitability and operating efficiency work together. DeLong and DeYoung (2007) claimed that the chosen performance proxies (profitability indicators and operating efficiency indicators) indicated a significant improvement for the post-merger performance. Consistent with DeLong and DeYoung (2007), Al-Sharkas et al. (2008) also showed that bank mergers help to improve cost and profit efficiencies by increasing technology efficiency (i.e. the merged banks have access to the most efficient technology available) and allocative efficiency (i.e. the merged banks can use a cost minimizing input mix)

3. Hypothesis Development

In this chapter, we develop three sets of hypotheses regarding the determinants of the discount in the FDIC-assisted acquisitions, discount reflected by BPG, and the effects of the discount on the post-merger performance of acquirers.

3.1 What Factors Impact Discount?

Contrast to the “winner’s curse” suffered by the winning bidders in normal merger, the prevalent existence of discounted target price in the FDIC P&A transactions can be observed in bid summaries and the costs to the DIF disclosed in the press release.

Wealth transfer, a similar concept of discount used in the previous literatures, has been documented and factors such as competitiveness of bidding, environment in banking industry, size of targets, experience of bidders, ability of acquirers and bargaining power of the FDIC are identified as relevant elements to impact wealth transfer based on different sampling periods and sample compositions. However, interpretation of wealth transfer is mainly derived from the post-merger abnormal returns of acquirers. We propose to calculate the discount from accounting information directly and test if the factors mentioned earlier also play a role in determining the discount.

The environment in banking industry during financial crisis period is featured as large supply of failed banks, increasing financial pressure of the FDIC and weak demand from survivor banks to buy a failed bank due to the high-risk nature of this type of mergers or simply due to the incapability of the survivor banks. Given that the FDIC’s deposit insurance fund (DIF) had a deficit around the third quarter of 2009 (see Figure B.3), it is reasonable to believe the incentive for the FDIC to over-subsidize the acquiring institutions in order to resolve the large amount of

failed banks in a timely manner. In practice, the FDIC provides subsidies by accepting bid lower than the fair value as long as it satisfies as the with least cost transaction.

Following Christoffersen et al. (2012), we use DIF Reserve Ratio, defined as the DIF balance divided by estimated insured deposits¹⁵, to proxy for the financial condition of the FDIC. If the financial pressure of the FDIC makes a major reason for discount, we would expect to see:

H1: DIF reserve ratio should negatively affect discount.

INSERT FIGURE B.3 HERE

Competition increases the winning bid, narrowing the difference between winning bid and the intrinsic value of target. James and Wier (1987b) argue that competition reduces the wealth transfer from the FDIC to acquirers for FDIC assisted mergers. Bidders, with different target value estimations, have the incentive to bid lower than their estimated fair price, especially during a period of large supply of failed banks. As potential bidders become more experienced at value estimation of failed bank valuation and bidding it created an environment for them to expropriate wealth from the FDIC. Several elements contribute to the less competitive bidding environment during our sampling period. First, the screening process leaves only a selected pool of participants in the P&A auction. Second, our sample only consists of whole-bank transactions, which require the potential acquirers to be more financially-sound. Third, this type of transactions is inherent with high risk, thus making potential buyers reluctant to bid. The above factors results in lower bid price from their estimated fair value even in the presence of multiple bidders. Thus the higher-than-normal discounts we observed during the financial crisis a result of less competition:

H2: Discount is negatively related to bidding competitiveness.

¹⁵ Source of Definition: FDIC website <https://www.fdic.gov/deposit/insurance>

Another aspect to consider is the size of failed bank, which may have mixed effects on discount. On one hand, the size of failed bank can positively impact bidding price by potentially generating larger post-merger synergy. A failed bank with larger customer base and more market share is more likely to facilitate profitability and cost efficiency enhancements, making the target more appealing to potential bidders, who may be willing to accept lower discount or even pay slight premium. Additionally, in a P&A transaction of a larger failed bank, the fixed costs such as the costs for due diligence are spread over larger size, leading to lower transaction costs per unit of assets acquired. Therefore, the acquirer of a larger failed bank may be willing to accept lower discount due to larger potential synergy and lower transaction costs. On the other hand, the size of failed bank can negatively affect bidding price by making the target less affordable to potential bidders. The FDIC may find it more difficult to resolve bigger failed banks due to the overall weakening purchasing power of survivor banks during the financial crisis, thus a higher discount is required to sell a large failed bank. Empirical results by Cochran et al. (1995) show that larger failed banks give rise to larger wealth transfer to acquirers. Possible explanations they provided include synergy effect and over subsidization, with the former expected to decrease discount while the latter to increase discount.

An alternative way to analyze size effect is calculating the relative size of the target and the acquirer. Christoffersen et al. (2012) reported positive relation between the relative size ratio (defined as target deposits/acquirer deposits) and the abnormal return, implying the larger size of the target relative to the acquirer leads to larger discount. In our study, we adapt the relative size method and hypothesize that:

H3: Relative size of target to acquirer is associated with discount.

Loss sharing agreement, as a unique risk-management tool used in the FDIC P&A transactions, is worthy of our special attention when considering the determinants of discount. Under loss sharing agreement, the FDIC promises to reimburse 80% of the losses, if ever occurred by the acquirer after the merger; the FDIC is also entitled to benefit from 80% of the potential gains from the recoveries of charged-off assets by acquirer. In order to gain the protection from the down-side risk, the acquirers are willing to pay more for such insurance. As a matter of fact, one

purpose of loss sharing is to minimize the costs to DIF by raising potential acquirers' confidence thus increasing the bid price. If the loss sharing agreement functions well as designed, we expect:

H4: The use of loss sharing agreement will have a negative relation to discount.

3.2 Discount and Bargain Purchase Gains

BPG, the earning from a bargain deal to be reported within 12 months after the merger, can be regarded as the part of discount admitted by the acquirers. Theoretically, the amount of reported BPGs should be directly related to discount level.

The key difference between the FDIC-assisted P&A transactions and unassisted mergers is the involvement of the FDIC. In the closed-form auctions, the restrictions placed by the FDIC on the participants' eligibility reduce the bidding competitiveness and the special role of the FDIC as an intermediary responsible for all the insured deposit repayments decreases the bargaining power of the FDIC during the crisis period. Therefore, discount for the FDIC-assisted P&A transactions is expected to be, on average, higher than the unassisted mergers. In terms of reporting frequency, the acquirers in the FDIC-assisted mergers are expected to report BPGs more frequently compared with their counterparts in the regular mergers. One possible explanation is that the purposes of reporting BPGs are different for the two groups of acquirers. For the assisted group, the vast majority of the failed bank in our sampling period are acquired at discount and BPG is used to claim the discount they receive from a bargain purchase. For the unassisted group, BPG functions as an earning smoothing technique and the acquiring institutions with declining net incomes are more likely to report BPGs (Dunn et al. 2015). We believe the acquirers who received discounts in the assisted group are far more than the acquirers who were experiencing earning decline before the merger, thus more frequent BPG reporting should be observed in the assisted group. Based on the discussion above, we hypothesize that:

H5(a): the acquirers of the FDIC-assisted mergers on average report higher BPGs than those of the unassisted mergers.

H5(b): the acquirers of the FDIC-assisted mergers on average report BPGs more frequently compared with those of the unassisted mergers.

3.3 Discount and Post-Merger Performance of Acquirer

Evidences (James and Wier 1987, Bertin, Ghanzanfari and Torbzadeh 1989, Cochrane, Rose and Fraser 1995, Zhang 1997, Cowan and Salotti 2015) support positive and significant abnormal returns for acquirers in P&A transactions. The positive stock market reaction can be explained by expected performance improvement for the merged entity or discount in such acquisitions. Improvements in accounting ratios may be just an artifact of the higher discount. It is reasonable to suspect the assets in a failed bank do not worth their book value, however, a high asset discount in such transactions may result in an inflated post-merger performance ratio. We consider return on asset (ROA) a profitability indicator. In P&A transactions, if larger-than-actual discounts are offered by the FDIC to the acquirer, the calculated ROA will be overestimated as a result of smaller denominator. The similar inflated effect also applies to ROE. So we want to test:

H6: the improvements in the post-merger profitability of acquirers partially result from discount.

4. Methodology

4.1 Discount Measurement

In this research, we use two different methods to measure the level of discount offered by the FDIC to the acquiring institutions.

In failed banks mergers & acquisitions (M&As), buyers are usually willing to pay a premium when assuming the deposits of the failed banks but pay a discounted price when purchasing the failed banks' assets. This is because deposits capture the franchise value or charter value of a bank, such as customer relationships, customer lists and value of the physical and online locations. In the sub-group of the whole-bank transactions, franchise value could be a major incentive for the acquiring institution to assume all the deposits of the failed bank, including the uninsured deposits. Only taking into account asset premium/discount and deposit premium into account, we calculate our first estimate of discount following Cowan & Salotti (2015). We call it Premium/Discount at Transaction.

Method 1:

$$\text{Discount(Premium)\%} = - \frac{\text{Asset Premium(Discount)} + \text{Deposit Premium}}{\text{Total Liabilites of Failed Bank}_T}$$

In Method 2, we assume that Equity (Assets – Liabilities) six months before the merger as the fair value of the failed bank, instead of the value provided by the FDIC in the auction summary. The FDIC often uses most recent quarter value of equity in their preparation of information for the auction. Since the failing institution has the incentive to manipulate the financial report when it is close to fail, we use equity value two quarters before the transaction in order to achieve better accuracy of equity value. According to Cowan & Salotti (2015) and Grant Thornton (2010), amount due from the FDIC or the acquiring institution is determined by adding up three components. The first component is asset premium/discount in dollar amount. The second component is deposit premium in dollar amount which is simply deposits multiplied by deposit

premium in percentage. The third component is transactional equity, the difference between total assets and total liabilities of the failed bank at the estimation time. The sum of the above three components is the amount due from the FDIC or the acquiring institution. In most P&A transactions, it is the FDIC that makes payments to the acquiring institutions, when the amount due from the FDIC or the acquiring institution is negative. So in the formula we use the estimated value of equity at the merger time, $EV(Equity_t)$, to indicate the amount due from the FDIC or the acquiring institution.

Method 2:

$$\text{Discount(Premium)\%} = \frac{Equity_{t-0.5} - EV(Equity_t)}{\text{Total Liabilities of Failed Bank}_{T-0.5}}$$

Where $EV(Equity_t) = Assets_t - Liabilities_t - Asset Discount + Deposit Premium$

4.2 Analysis: Factors Affecting Discount

Two geographic factors are included in the regression as control variables. First, we add dummy variables Same City and Same State, both equal to 1 if the failed bank and the acquiring institution are located in the same city or the same state, respectively, and equal to 0 otherwise. This dummy variable may have a positive or negative sign. An acquiring institution which is located in the same city or same state as the failed bank may be willing to pay premium or accept less discount because acquiring the failed bank may generate economies of scale and scope. On the other hand, there are also cases in which the outsiders pay more because by acquiring the failing bank may be their way to expand to a new geographical region. We include a state characteristic variable to capture the economic condition of the state of the failing bank. We choose the quarterly average unemployment rate in a specific state where the failed bank is located. A failed bank located in a state suffering from the negative post-crisis impact may be more difficult for the FDIC to resolve due to lack of potential buyers within the same state due to the lower potential to generate post-merger synergy and given the higher risk.

Number of bids is selected as the competition indicator. In the P&A auction, a bidder can submit more than one bid and the FDIC selects the least-cost bid for the DIF. Compared with number of bidders, number of bids more accurately reflects the level of bidding competitiveness.

We use quarterly DIF Reserve Ratio as the proxy for the financial pressure on the FDIC. Christoffersen et al. (2012) argue that large abnormal returns of the acquiring institutions in the FDIC failed bank merger are associated with large DIF outflows, which can be interpreted as the financial pressure on the FDIC. We argue that if the abnormal returns are related to the wealth transfer then the FDIC is more likely to offer higher discount to the acquiring institutions when the FDIC is financially constrained.

We include a relative size variable. This is a ratio of total liabilities of the failed bank on the total liabilities of the acquirer. As we discussed in H3, relative size can have mixed effects on discount. If we find positive relation between relative size and discount, it means the difficulty to resolve the larger failed banks offsets the benefits of potential synergy.

The last factor we consider is the involvement of loss sharing agreement. Loss sharing agreement between the acquiring institution and the FDIC changes the risk profile of the acquirer by decreasing the down-side loss as well as decreasing the up-side gain. This risk-management technique is used by the FDIC to market the failed bank quickly and less-costly. Accordingly, we expect that loss sharing agreement lowers the discount level. In terms of percentage of assets covered by loss sharing agreement, the higher percentage covered by loss sharing should decrease the discount, if the FDIC is not over-subsidizing the acquirers.

Based on what we discussed above, we organize Equation 1 as follows:

Equation 1:

$$\text{discount}_1(\text{or } \text{discount}_2) = \alpha_0 + \alpha_1 \text{same city}(\text{or } \text{same state}) + \alpha_2 \text{state characteristic} + \alpha_3 \text{number of bids} + \alpha_4 \text{DIF reserve ratio} + \alpha_5 \text{relative size} + \alpha_6 \text{lsa} \left(\text{or } \frac{\text{lsa}}{\text{tl}} \right) + \varepsilon$$

4.3 Analysis: Factors Affecting Bargain Purchase Gain (BPG)

We argue that BPG is also a form of discount. As such we argue that similar factors will also be helpful to explain BPG except for the loss-sharing-related variables (lsa and lsa/tl) are applied here. Following Dunn et al. (2015), we further add a set of variables to reflect the pre-merger profitability/earnings change of the acquirer. Equation 2 is constructed as follows:

Equation 2:

$$\frac{\text{BPG}}{\text{TL}} = \alpha_0 + \alpha_1 \text{same city (or same state)} + \alpha_2 \text{state characteristic} + \alpha_3 \text{number of bids} + \alpha_4 \text{DIF reserve ratio} + \alpha_5 \text{relative size} + \alpha_6 \text{pre-merger profitability change} + \varepsilon$$

For α_6 , the estimation is based on different sets of changes in profitability indicators for different time periods, including ROA and ROE changes for past one quarter, half year and one year before the merger.

We estimate this equation using Tobit model. In theory, BPG should be no more than the value of failed bank liabilities. Therefore, Tobit estimation is more appropriate because the value of bpg/tl varies between 0 and 1.

4.4 Analysis: Effect of Discount on Post-Merger Performance of Acquirer

As we illustrated in Hypothesis 6, acquirer's post-merger performance, especially profitability, may be partly driven by the accounting treatment of the discount. Based on Behr and Heid (2011), size, cost-income ratio, interest margin, equity ratio, non-performing loans and liquidity ratio are identified as typical bank-specific factors that impact the profitability. We use the bank-specific factors as control variables and analyze the effect of acquiring a failed bank at a discounted price on the acquirer's profitability change using Equation 3:

Equation 3:

$$\text{post-merger profitability change} = \alpha_0 + \alpha_1 a_{\text{size}} + \alpha_2 a_{\text{ci}} + \alpha_3 a_{\text{im}} + \alpha_4 a_{\text{eqr}} + \alpha_5 a_{\text{npl}} + \alpha_6 a_{\text{lqr}} + \alpha_7 \text{discount}_1 (\text{or } \text{discount}_2) + \varepsilon$$

5. Data

Our sample of failed banks comes from the failed bank list disclosed on the FDIC website. There was a total of 349 banks that failed during our sample period, the fourth quarter of 2009 to the first quarter of 2013. The cut-offs of sample period depend on data availability and our research purpose. More specifically, standardized bid summaries were not available until the late second quarter of 2009 and the reporting of BPGs became mandatory at the fourth quarter of 2009. Moreover, since our research purpose focuses on post-crisis period, we drop failed banks that happened after the first quarter of 2013.

The sample filtering process includes the following steps. First, we eliminate the non-whole-bank transactions for the simplicity of accounting analysis. In whole-bank transactions, the acquiring institutions assume all the deposits and purchases all the assets of the failed banks. Second, we exclude the cases in which the acquiring institutions participated in another merger with or without the assistance of the FDIC as acquirer or was a target for subsequent merger anytime from one year before through one year after the studied merger, in order to avoid the noise from the other mergers. We further delete the cases where a bridge bank involved. Lastly, we drop the cases with missing variables for our main test and use the full sample for robustness test. The above processes leave us a filtered sub-sample of 99 transactions and a full sample of 122 transactions, as shown in Table C.1.

INSERT TABLE C.1 HERE

For each P&A transaction, we collect the information about bidding details, level of bidding competition, and geographic location from the bid summary. The bidding details we focus on are deposit premium and asset premium/discount offered by the acquiring institution. Number of bids is chosen to proxy for bidding competitiveness. To control for the potential effect of geographic factors on the discount, we create a dummy variable showing whether the acquiring

institution and the failed bank are operating in the same city or same state. For another geographic factor (state characteristics), we obtain the quarterly unemployment rate for a specific state from the Bureau of Labor Statistics. Information about loss-sharing agreement including whether the acquiring institution signed a loss-sharing agreement with the FDIC and the amount of assets that were covered by the agreement comes from the press release for each transaction.

Our research also relies on the accounting data. Disclosed in the Consolidated Reports of Condition and Income, or simply Call Reports, from the Federal Financial Institutions Examination Council (FFIEC), quarterly accounting data for both failed banks and acquiring institutions are used to estimate the discount offered by the FDIC to the acquiring institutions. On the failed bank side, we collect total assets and total liabilities at the merger time and six month before the merger. $\text{Log}(\text{total assets})$ is used as a proxy for the size of a failed bank and the assets of failed bank divided by the those of acquirer indicates the relative size of the target relative to the acquirer. Furthermore, the value of total liabilities is used to scale estimated discounts, BPGs, and the amount of assets covered by loss-sharing agreement. On the acquiring institution side, we collect quarterly gains on bargain purchases reported one year following the merger and what we need to calculate the operating performance as well as the bank-specific factors that influence operating performance according to Behr and Heid (2011)¹⁶. More specifically, the BPGs are discounted back to the transaction time by the federal fund rate and the sum of the discounted BPGs is scaled by the total liabilities of the failed bank. Next, changes in return on assets (ROA) and return on equity (ROE) for different time periods (one quarter, half year and one year before and after the merger) are used to reflect changes in operating performance. The details about the bank-specific factors can be found in Appendix A: Data Definitions.

INSERT TABLE C.2 HERE

Table C.2 provides descriptive statistics of all variables mentioned above, based on the sub-sample (Panel A) and full sample (Panel B). We mainly focus on Panel A since our main tests

¹⁶ For the data missing in the Call Reports, we searched from the Bank Data & Statistics section of the FDIC website. (Link: <https://www5.fdic.gov/idasp/main.asp>)

are relied on sub-sample. On average, the assets of a failed bank are sold at a discount of 15.44%, while the deposits are assumed at a premium of 0.33%. In an extreme case, the acquirer even discounts the failed bank assets as much as 55.7%. In rare cases, premiums are paid on assets, with the maximum premium of 27.78%. Deposit premiums stay non-negative and vary from 0 to 7.65%. The number of bids received varies from 1 to 29 and the average is about 5. Around 77% of the mergers involve the failed bank and the acquirer from the same state; however, the ratio drops to around 10% when it comes to cases in which the failed bank and the acquirer are located in the same city. Next, the relative size is found to be 65.4% on average, while the maximum relative size is as large as 2246% (that is, the total liabilities of the target are 22.46 times as large as the total liabilities of the acquirer.) Another fact of the near-zero value of average DIF reserve ratio shows that the FDIC was under financial pressure during our sample period¹⁷. State characteristic, defined as quarterly unemployment rate of the states where the failed banks locate, shows a range from 4.2% to 16.9%, with a mean of 9.04%. With regard to the loss sharing agreement, the FDIC signed loss sharing agreement with the acquirer in slightly more than half (51%) of the selected transactions, and loss sharing agreement, on average, covers 38.31% failed bank assets

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¹⁷ In the full sample, the average DIF reserve ratio is even negative (-2.38%).

¹⁸ Note that assets under loss sharing agreement are scaled by total liabilities of failed bank.

6. Results

6.1 Discount and Factors Influencing Discount

We start with measuring discount using two different methods. Table C.3 presents the estimated discounts for sub-sample and full sample in Panel A and Panel B, respectively. Focusing on sub-sample, the mean for discount calculated by method 2 (12.31%) is bigger than that for discount by method 1 (11.91%). At the upper extreme, we can see discount reach as large as 55.70% under method 1 and 56.94% under method 2. At the lower extreme, the acquirer pays a premium of 27.78% under method 1 and a premium of 25.22% under method 2. The results for the full sample are similar.

INSERT TABLE C.3 HERE

We next examine the factors determining the discount. Table C.4 shows the correlation matrix of all relevant independent variables based on the sub-sample. There are several pairs of larger correlations worth our attention. First, we can see that the correlation between DIF reserve ratio and state characteristic has a negative sign and a relative large magnitude of -0.4067, suggesting the worse the economic condition in states where the failed banks are located (higher unemployment rate), the higher the financial pressure of the FDIC is (lower DIF reserve ratio). Second, it seems that the FDIC more often uses loss sharing agreement to market the failed banks when the FDIC itself is financially constrained (low DIF reserve ratio), which is implied by the correlation between DIF reserve ratio and *lsa* of -0.3562. Moreover, in the cases with a loss sharing agreement, more assets are covered by loss sharing when the DIF reserve ratio is lower, reflected by the correlation between DIF reserve ratio and *lsa/tl* of -0.3774. Third, a positive and relative large correlation between state characteristic and *lsa* of 0.2685 shows that loss sharing is more used in transactions where the failed bank is located in a badly impacted state in financial crisis, with quarterly unemployment rate in the state as the proxy for general

economic condition in that state. Similarly, in states with worse economic condition, the FDIC is willing to offer larger coverage for the failed bank assets, shown by the correlation between state characteristic and lsa/tl of 0.2768. Last, since lsa and lsa/tl have a quite high correlation of 0.9751, we do not include both of them in our regression in order to avoid multicollinearity.

INSERT TABLE C.4 HERE

In Panel A and Panel B of Table C.5 we present the regression results for factors influencing discount calculated by method 1 and method 2, respectively. As expected, number of bids (used as a proxy for bidding competitiveness) is found to be significant both statistically and economically. With number of bids increasing by one, discount on average is predicted to decrease by 0.41% (for $discount_1$) to 0.54% (for $discount_2$). This finding aligns with the previous finding by James and Wier (1987b) regarding the negative effect of competition on acquirer's abnormal returns.

DIF reserve ratio does not appear as a significant factor under either discount calculation method, which is inconsistent with Christoffersen et al. (2012). In other words, our results suggest that the deteriorated financial condition of the FDIC during financial crisis does not cause larger discount of the failed bank.

In terms of relative size between the failed bank and the acquirer, the results show a strong positive relation between relative size and discount level at 99% confidence level under both calculation methods. Economically, a 1% increase in relative size will, on average, lead to a 0.83% increase in $discount_1$ and 0.75% increase in $discount_2$. The positive relation implies that the FDIC offers larger discount to acquirers who buy a larger target relative to their own size, given the limited purchasing power of the acquirers during financial crisis. The effect of size on making the deal more risky and more difficult to complete surpasses the effect on cutting transaction costs and generating potential synergies, which is reasonable during the economic downturn.

The last factor we focus on is loss sharing agreement. We test loss sharing agreement separately as a dummy variable and as a ratio of the assets value covered by the loss sharing arrangement to

total liabilities of the failed bank. Both results turn out to be significant and the negative. Loss sharing agreement is designed to increase incentive for the acquirers to purchase more assets of the failed bank, and keep more assets within the banking system. The involvement of loss sharing is supposed to cut the resolution costs for the DIF, thus lowering the discount level. Similarly, more assets covered by the loss sharing agreement should also be associated with the incentive for potential acquirers to bid higher (accept less discount). The magnitude of the coefficients is economically significant as well. Compared to cases that are not covered by loss sharing agreement, acquirers have received less discount (11.88% less for discount by method 1 and 10.56% less for discount by method 2) when they acquired a failed bank. Furthermore, 1% increase in $l_{sa/tl}$ will lead to 14.59% decrease in $discount_1$ and 13.45% decrease in $discount_2$.

As for our geographical control variables, *same city* and *same state*, results are inconclusive. Buying a failed bank in the same geographical location may allow the acquirers to gain more market shares in the local market, and the strategic value of empire building along with the merger encourages the acquirers to bid higher and accept lower discount. On the other hand, it is also possible for the acquirer to bid lower and ask for higher discount due to lack of geographical diversity. From results in Table C.5, we observe that acquirers operating in the same city as the failed bank tend to bid lower in Panel A, which supports our first explanation. However, those in the same state as the failed bank tend to bid higher in Panel B, consistent with our second explanation.

INSERT TABLE C.5 HERE

In summary, bidding competitiveness, relative size and loss sharing agreement are found to play a key role in determining the discount level in whole-bank P&A transactions, while DIF reserve ratio does not seem to be a significant factor. Actually, DIF reserve ratio could represent the overall economic condition in banking industry to some extent. The positive relationship between DIF reserve ratio and number of bids showed in Table C.4 provides supportive evidence to this alternative explanation, which implies that the better overall economic condition allows more eligible banks to participate and bid in P&A auctions.

6.2 Discount Reflected by Bargain Purchase Gains

By comparing BPG in the FDIC-assisted mergers and that in the unassisted mergers, we can approximately compare the discounts in the two types of mergers. Table C.6 provides the descriptive statistics of the average BPGs reported by the acquirers in FDIC-assisted and non-FDIC-assisted mergers, both scaled by total liabilities of the target bank (for FDIC assisted mergers they are the failed banks). The non-assisted-merger sample is determined using similar filtering process as we did for the assisted-merger sample. Transaction type (such as all deposit whole bank, all deposit modified whole bank, and clean P&A) is disclosed in bid summary for each FDIC-assisted P&A transaction, but there is no such information disclosed for unassisted mergers¹⁹. The cases in which the acquirers participate in more than one merger within (-1 year, +1 year) window are excluded, resulting in a non-assisted-merger sample size of 316. Further, we discount BPGs for both groups by Federal Funds Rate, sum up the discounted values and present the sum as a fraction of the total liabilities of the failed bank.

INSERT TABLE C.6 HERE

The mean value of BPG (and their frequency) for the FDIC-assisted mergers is dramatically larger than that of the non-assisted mergers (7.57% vs. 1.27% for sub sample; 6.22% vs. 1.27% for full sample) and the differences in mean are statistically significant at 99% confidence level. In addition, the comparison on reporting frequency reveals that 60.61%²⁰ of acquirers in the FDIC-assisted mergers report BPGs, while only 13.29% of their counterparts in non-assisted mergers report BPGs.

Tobit estimation result of equation 2 is presented in the Table C.8. We find number of bids have significant and negative impact on BPG. It is consistent with our previous result of discount that competitiveness increases bid price and reduce discount.

Our results do not support the earning smoothing incentive argued by Dunn et al. (2015), which reports larger BPGs is associated with pre-acquisition earnings decline of the acquirers. Possible

¹⁹ There is no transaction type disclosure at least from the source we obtain the unassisted merger data.

²⁰ This information is from sub-sample. For full sample, the reporting frequency is 50%, still much higher than the non-assisted-merger sample.

explanations may arise from differences in sample and estimation method. First, our study focuses on whole-bank transactions rather than all P&A transactions as in Dunn et al. (2015). Second, their sampling period from 2009 to 2010 covers a shorter post-crisis period, compared with our sampling period from 2009Q4 to 2013Q1. In addition, Dunn et al. (2015) use both BPG and earning decline as dummy variables, while we use them as continuous variables.

INSERT TABLE C.8 HERE

We re-estimate Equation 2 pulling together the sample of the FDIC-assisted mergers and regular mergers over the same period. We do not include number of bids information in the model since for regular mergers that information is missing. From the results presented in Table C.9 we find that only state characteristics effects BPG. The positive sign implies that the worse economic condition in the state of the target bank the higher BPG reported by acquiring institution.

INSERT TABLE C.9 HERE

6.3 Effect of Discount on Post-Merger Profitability Change of Acquirers

We report the estimation of Equation 3 in Panel A and Panel B of Table C.10, with Panel A containing results for ROA change and Panel B for ROE change. As expected, participating in a failed bank merger with a bargain purchase (with discount) can positively impact the financial indicator of profitability for acquirers.

The independent variables comprise possible profitability determinants from two aspects. In one aspect, the post-merger profitability changes may be driven by bank-specific factors, which we consider as the indicators of the fundamental ability of the acquiring institution. In another aspect, discount received in a failed bank acquisition may artificially inflate the chosen profitability indicators, as explained in the hypothesis development chapter. Consistent with our hypothesis we expect the sign for α_7 to be positive and significant, showing that larger discount results in larger profitability improvement. Consistent with our theory, for discounts calculated by method

1 and method 2 positively affect ROA change as well as ROE change for one quarter and half year after the merger, though the coefficients of discount for ROA change is less significant economically than coefficient change for ROE change. Another interesting observation is that the effect gradually fades away after one year. Accordingly, we can conclude that the effect of discount on post-merger profitability improvements is temporary.

INSERT TABLE C.10 HERE

6.4 Robustness Test 1: Results Based on Full Sample

In order to test the consistency of our results, we do the same analysis on the discount and the BPG based on the largest sample. Table C.11 we present the results of discount determinants. The same factors are identified as significant (number of bids, relative size, l_{sa} and $l_{sa/tl}$). Similar results again are found in Table C.12 with regard to BPG determinants; Tobit estimation turn out to be exactly the same, only with variations in coefficients. The positive relation between ROE change and bpg/tl is consistent with what we find for non-FDIC-assisted mergers. We tend to believe it results from the recovery of overall economic condition in banking industry. Table C.13 provides the robustness of post-merger profitability change for acquirers. Similar short-term effect of discount on acquirers' profitability is found for both ROA and ROE.

INSERT TABLE C.11 HERE

INSERT TABLE C.12 HERE

INSERT TABLE C.13 HERE

6.5 Robustness Test 2: Relative Size

As shown in Table C.2, the maximum relative size between the failed bank and the acquirer is as high as 22 times. In order to avoid the bias from the extreme cases, we exclude three cases in which the relative size is larger than or equal to two and report the results of discount determinants in Table C.14. Relative size becomes insignificant, showing that the previously-

identified significant relation between relative size and discount may be driven by the extreme cases.

INSERT TABLE C.14 HERE

6.6 Robustness Test 3: Results across Sub-Periods

Adding on robustness test 2, we further test the consistency of our results across different phases of financial crisis. We split our sample into two sub-periods, with the first half from 2009Q4 to 2010Q4 and the second half from 2011Q1 to 2013Q1. As shown in Figure B.3, the DIF reserve ratio became negative during 2009Q3 and 2011Q1, suggesting the contraction and trough phase of financial crisis in our sampling period. The way we split our sample differentiates the contraction phase and recovery phase and the results of the two sub-periods are different.

In Table 15, we show results of discount determinants for two sub-periods in Panel A and Panel B, respectively. The results for the first sub-period are consistent with our previous results in robustness test 2, while results for the second sub-period are slightly different because number of bids becomes insignificant. Furthermore, the results of BPG regression show similar results with our main test for the first sub-period. For the second sub-period, DIF reserve ratio is significant at 10% significance level.

INSERT TABLE C.15 HERE

INSERT TABLE C.16 HERE

7. Conclusion

In this study, we measure the discount in the FDIC-assisted P&A transactions using accounting information and examine the determinants of the discount, based on a unique sample of whole-bank transactions in the recent financial crisis. We find that less bidding competition, larger size of the failed bank relative to the acquirer and the absence of loss sharing agreement are associated with larger discount in the FDIC-assisted failed bank acquisitions. However, relative size becomes insignificant after we exclude the extreme cases in which the relative size between the failed bank and the acquirer is larger than or equal to two. Moreover, we fail to find evidence that the financial health of the FDIC affects the discount, as documented by Christoffersen et al. (2012). We further investigate if the identified factors for the discount also affect BPG reported by the acquirers, an indicator we believe directly related to the discount. By a comparison analysis, we find significantly larger BPGs are reported by acquirers in the FDIC-assisted acquisitions, compared to those in the non-assisted acquisitions. Additionally, the acquirers in the FDIC-assisted mergers also on average report BPGs more frequently. Above findings provide evidence for larger discount experienced by the failed banks resolved by the FDIC-assisted P&A transactions. The regression results show that only bidding competitiveness among the factors above continue to be significant, consistent with prior literature (Dunn et al. 2015). In a robustness test, we also observe some significance of DIF reserve ratio for a sub-period from 2011Q1 to 2013Q1. What we find inconsistent with Dunn et al. (2015) is the earning management by the acquirers using BPGs. Results from our FDIC-assisted-merger sample do not provide evidence for the earning management. This is probably a result of differences in sample composition and estimation specifications used in our study.

These findings have further implications for the prevalent existence of discount in the FDIC-assisted failed bank acquisitions. Discount is a result of the nature, structure, and timing of this subset of acquisitions, as suggested by the Office of the Comptroller of the Currency [OCC] in 2010. The nature of closed-form auction with only qualified participants creates a less

competitive bidding environment. The resolution structure, with limited resolution time allowed and limited information distributed, makes it harder to get accurate value estimation, leading participants to bid more conservatively. Moreover, the timing of these acquisitions during industry distress forces the FDIC to offer larger discount in cases where an interested participant bids for a larger size failed bank than itself, or the target may turn out to be unaffordable to potential bidders. As it is designed, loss sharing agreement successfully decreases the discount and cuts the resolution costs for the DIF.

We also conduct a cross-sectional analysis and document that discount has explanatory power of the short-term post-merger profitability improvements of the acquirers. Nevertheless, the effect ceases to exist after one year. This finding supports our thought that the post-merger profitability improvements of the acquirers are overestimated due to the existence of discount during a period of industry-wide crisis. Previous literatures have shown that the market reacts positively to the FDIC-assisted failed bank resolution events, expecting the merged entity to experience post-merger synergies. Our study points out that the synergy we observe from accounting information may be overestimated in the shorter term, because the existence of discount leads to underestimated denominator for profitability indicators and yields an artificial profitability improvement.

Focusing on the sample of the most recent financial crisis, our study provides insights on the differences between the FDIC-assisted mergers and the non-FDIC-assisted mergers in terms of discount, the determinants of discount, and the effects of discount on post-merger profitability improvements for acquiring institutions. Since no previous literature has looked into the determinants of discount so far, our study contributes to the literatures of the FDIC-assisted failed bank acquisitions.

Further implications can be made for the FDIC and bank managers. For the FDIC, the negative relation between loss sharing agreement and discount implies that loss sharing agreement functions well to decrease the costs for DIF. For bank managers, the results of our study suggest the managers of the financially-sound banks participate in the FDIC-assisted failed bank P&A auctions to take advantage of the discount offered by the FDIC and its transitory effect on boosting post-merger profitability.

With regard to future research, we provide the following several suggestions. First, our discount measurement can be imperfect, and more adjustments can be made on the components of discount. For instance, instead of directly using the equity value two quarters before the merger as the fair value of failed bank, we can estimate the fair equity value at the merger time based on the average quarterly deterioration rate for the past one year. Second, future researchers can further distinguish the differences between publicly-traded banks and private banks. Unlike the limitation on financial information for corporate mergers, the availability of accounting information for both publicly-traded and private banks makes it possible to look into the differences between the two groups.

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Appendix A: Data Definition

Variable	Definition	Call Report Code	
		FFIEC 031 ²¹	FFIEC 041 ²²
discount1	discount calculated by proposed method 1	N/A	N/A
discount2	discount calculated by proposed method 2	N/A	N/A
same city	failed bank and acquirer are in the same city (dummy)	N/A	N/A
same state	failed bank and acquirer are in the same state (dummy)	N/A	N/A
lsa	loss-sharing agreement involved case (dummy)	N/A	N/A
lsa/tl	assets covered by loss-sharing agreement divided by total liabilities of the target	N/A	N/A
bpg/tl	discounted sum of bargain purchase gains divided by total liabilities of the target	RIADJ447/RCFD2948	RIADJ447/RCON2948
relative size	liabilities of the target/ liabilities of the acquirer	RCFD2948target/RCFD2948acquirer	RCON2948target/RCON2948acquirer
DIF reserve ratio	the DIF balance divided by estimated insured deposits	N/A	N/A
state characteristic	quarterly unemployment rate in percentage within the state where the failed bank is located	N/A	N/A
tl	total liability	RCFD2948	RCON2948
a_size	log(assets of the acquirer)	log(RCFD2170)	log(RCON2170)
a_ci	cost-income ratio of the acquirer = sum of current interest and non-interest expenses/ sum of current interest and non-interest incomes	(RIAD4037+RIAD4093)/(RIAD4107+RIAD4079)	(RIAD4037+RIAD4093)/(RIAD4107+RIAD4079)
a_im	interest margin of the acquirer = interest rate on interest-bearing assets – interest rate on interest-bearing liabilities	RIAD4107/[RCFD2170 - (RCFD0081+RCFDB639)]- RIAD4073/[RCFD2950 - (RCON6631+RCFN6631+RCFD2930)]	RIAD4107/[RCON2170- (RCON0081+RCONB639)]- RIAD4073/[RCON2950- (RCON6631+RCON6631+RCON2930)]
a_eqr	equity ratio of the acquirer = equity/ lagged assets	RCFD3210/IRCFD2170	RCON3210/IRCON2170
a_lqr	liquidity ratio of the acquirer = total liquid assets (cash and cash equivalence, fed funds sod, securities available for sale, securities held to maturity)/ lagged total assets	(RCFD0010+RCONB987+RCFDB989+RCFD1754+RCFD1773)/IRCFD2170	(RCFD0010+RCONB987+RCONB989+RCON1754+RCON1773)/IRCON2170
pre_roa_onequarter	Acquirer return on assets change	ROA:	ROA: RIAD4340/RCON2170

²¹ Call Report Code which starts with RCFD comes from *Consolidated Reports of Condition and Income for A Bank With Domestic and Foreign Offices—FFIEC 031*

²² Call Report Code which starts with RCON comes from *Consolidated Reports of Condition and Income for a Bank with Domestic Offices Only—FFIEC 041*

	one quarter BEFORE the merger	RIAD4340/RCFD2170	
pre_roa_halfyear	Acquirer return on assets change half year BEFORE the merger	same as above	same as above
a_npl	non-performing loan of the acquirer = total current non-performing loans (loans past due 90 days or more but still accruing plus nonaccrual loans)/ lagged total assets	a. loans past due 90 days or more (2009 and 2010): RCON2769+RCON3494+RCON5399+RCONC237+RCONC239+RCON3500+RCON3503+RCFDB573+RCFD5378+RCFD5381+RCFD1597+RCFD1252+RCFD1255+RCFDB576+RCFDB579+RCFD5390+RCFD5460+RCFD5460+RCFDF167+RCFD170	a. loans past due 90 days or more (2009 and 2010): RCON2769+RCON3494+RCON5399+RCONC237+RCONC239+RCON3500+RCON3503+RCONB835RCON1607+RCONB576+RCONB579+RCON5390+RCON5460+RCON1227
		a'. loans past due 90 days or more (since 2011): RCONF174+RCONF175+RCON3494+RCON5399+RCONC237+RCONC239+RCON3500+RCONF180+RCONF181+RCFNB573+RCFD5378+RCFD5381+RCFD1597+RCFD1252+RCFD1255+RCFDB576+RCFDK214+RCFDK217+RCFD5390+RCFD5460+RCFDF167+RCFD170	a'. loans past due 90 days or more (since 2011): RCONF174+RCONF175+RCON3494+RCON5399+RCONC237+RCONC239+RCON3500+RCONF180+RCONF181+RCONB835+RCON1607+RCONB576+RCONK214+RCONK217+RCON5390+RCON5460+RCON1227
		b. nonaccrual loans (2009 and 2010): RCON3492+RCON3495+RCON5400+RCONC229+RCONC230+RCON3501+RCON3504+RCFDB574+RCFD5379+RCFD5382+RCFD1583+RCFD1253+RCFD1256+RCFDB577+RCFDB580+RCFD5391+RCFD5461+RCFDF168+RCFDF171	b. nonaccrual loans (2009 and 2010): RCON3492+RCON3495+RCON5400+RCONC229+RCONC230+RCON3501+RCON3504+RCONB836+RCON1608+RCONB577+RCONB580+RCON5391+RCON5461+RCON1228
		b'. nonaccrual loans (since 2011): RCONF176+RCONF177+RCON3495+RCON5400+RCONC229+RCONC230+RCON3501+RCONF182+RCONF183+RCFDB574+RCFD5379+RCFD5382+RCFD1583+RCFD1253+RCFD1256+RCFDB577+RCFDK215+RCFDK218+RCFD5391+RCFD5461+RCFDF168+RCFD171	b'. nonaccrual loans (since 2011): RCONF176+RCONF177+RCON3495+RCON5400+RCONC229+RCONC230+RCON3501+RCONF182+RCONF183+RCONB836+RCON1608+RCONB577+RCONK215+RCONK218+RCON5391+RCON5461+RCON1228

pre_roa_oneyear	Acquirer return on assets change one year BEFORE the merger	same as above	same as above
pre_roe_onequarter	Acquirer return on equity change one quarter BEFORE the merger	ROE: RIAD4340/(RCFD2170-RCFD2948)	ROE: RIAD4340/(RCON2170-RCON2948)
pre_roe_halfyear	Acquirer return on equity change half year BEFORE the merger	same as above	same as above
pre_roe_oneyear	Acquirer return on equity change one year BEFORE the merger	same as above	same as above
post_roa_onequarter	Acquirer return on assets change one quarter AFTER the merger	ROA: RIAD4340/RCFD2170	ROA: RIAD4340/RCON2170
post_roa_halfyear	Acquirer return on assets change half year AFTER the merger	same as above	same as above
post_roa_oneyear	Acquirer return on assets change one year AFTER the merger	same as above	same as above
post_roe_onequarter	Acquirer return on equity change one quarter AFTER the merger	ROE: RIAD4340/(RCFD2170-RCFD2948)	ROE: RIAD4340/(RCON2170-RCON2948)
post_roe_halfyear	Acquirer return on equity change half year AFTER the merger	same as above	same as above
post_roe_oneyear	Acquirer return on equity change one year AFTER the merger	same as above	same as above

Appendix B: Figures

Historical Incidence of Bank Failures

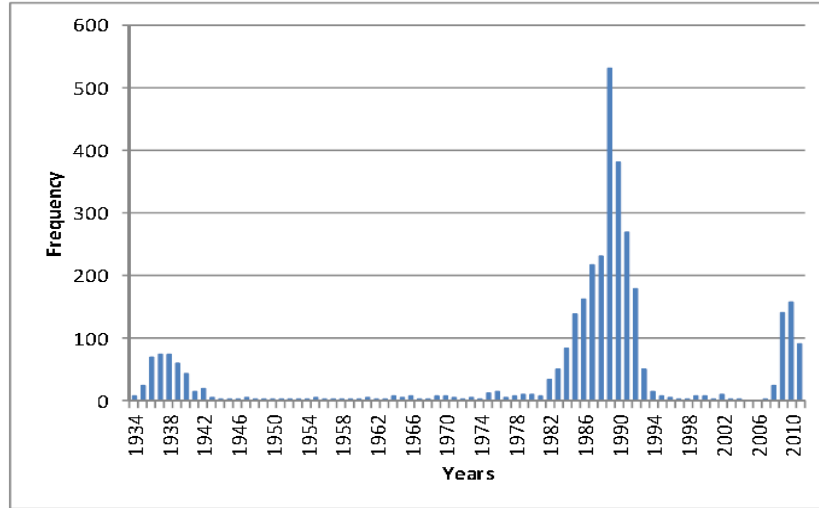


Figure B.1: Historical Incidence of Bank Failures This graph plots the frequency of bank failures resolved by the FDIC Purchase & Assumption from 1934 to 2010. Source: Christofferson et al. (2012) Figure 1

Number of the FDIC-Insured Bank Failures

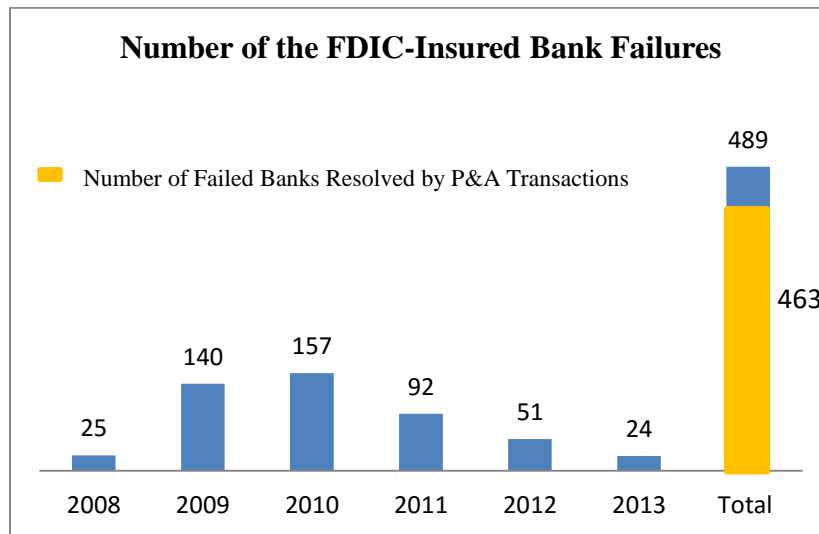


Figure B.2: Incidence of the FDIC-Insured Bank Failures during 2008 and 2013 This graph shows frequency of the FDIC-insured bank failures during 2008 and 2013 and the portion resolved by the FDIC Purchase & Assumption. Source: the FDIC website – historical statistics – Failures and Assistance Transactions

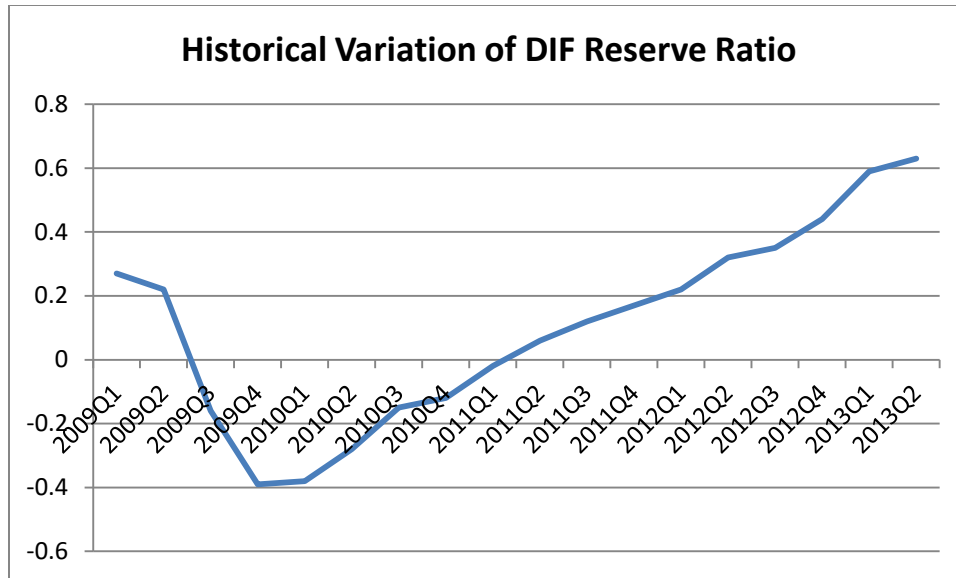


Figure B.3: Historical Variation of Deposit Insurance Fund (DIF) Reserve Ratio

This graph demonstrates the fluctuation of Deposit Insurance Fund reserve ratio during 2009 Q1 and 2013 Q2. Deposit Insurance Fund reserve ratio is defined as the Deposit Insurance Fund balance divided by estimated insured deposits and is reported in the FDIC quarterly reports.

Source: the FDIC quarterly reports

Appendix C: Tables

Table C.1
Sample Filtering

Failed banks resolved by P&A transactions	349
Less:	
Non-whole bank transactions	-22
Failed banks which the FDIC failed to find an acquirer	-16
Multiple acquisitions within (-1 , +1) window by the same acquirer	-187
Bridge banks involved cases	-2
Filtered full sample	122
Less:	
Cases with missing variables	-23
Filtered sub-sample	99

This table provides the sample filtering process. Sampling period is from 2009Q4 to 2013Q1. Some cases fall into multiple elimination categories.

Table C.2
Descriptive Statistics
Panel A: sub-sample with no missing variables

Variable	Mean	STDEV	Min	Max	N
asset premium²³	-0.1544	0.1181	-0.5570	0.2778	99
deposit premium%	0.0033	0.0094	0.0000	0.0765	99
number of bids	5.0404	4.9691	1.0000	29.0000	99
number of bidders	2.9293	1.8912	1.0000	10.0000	99
same city	0.1010	0.3029	0.0000	1.0000	99
same state	0.7677	0.4245	0.0000	1.0000	99
target size	5.1629	0.5287	3.9731	6.7544	99
relative size	0.6540	2.3219	0.0079	22.4595	99
DIF reserve ratio	0.0033	0.2899	-0.3900	0.5900	99
state characteristic	9.0354	2.2868	4.2000	16.9000	99
lsa	0.5051	0.5025	0.0000	1.0000	99
lsa/tl	0.3831	0.3909	0.0000	1.0449	99
pre_roa_onequarter	-0.0005	0.0065	-0.0320	0.0202	99
pre_roe_onequarter	-0.0005	0.0527	-0.2123	0.2096	99
pre_roa_halfyear	0.0004	0.0072	-0.0272	0.0154	99
pre_roe_halfyear	0.0053	0.0616	-0.2427	0.1319	99
pre_roa_oneyear	0.0000	0.0073	-0.0318	0.0388	99
pre_roe_oneyear	-0.0002	0.0555	-0.1563	0.2511	99
post_roa_onequarter	0.0047	0.0093	-0.0123	0.0433	99
post_roe_onequarter	0.0417	0.0748	-0.1064	0.3347	99
post_roa_halfyear	0.0043	0.0122	-0.0408	0.0512	99
post_roe_halfyear	0.0347	0.1020	-0.4693	0.4057	99
post_roa_oneyear	0.0040	0.0107	-0.0085	0.0658	99
post_roe_oneyear	0.0298	0.0774	-0.0878	0.5822	99
a_size	13.3990	1.6809	9.5636	19.5268	99
a_ci	0.7855	0.2996	0.3543	3.0531	99
a_im	0.0880	0.0235	0.0194	0.1673	99
a_eqr	0.1333	0.0633	0.0527	0.4505	99
a_npl	0.0156	0.0138	0.0000	0.0925	99
a_lqr	0.3068	0.1703	0.0601	0.8733	99

Table C.2 shows the descriptive statistics for all independent variables used in our study. Panel A presents the results based on sub-sample, which only contains cases without missing variables. Source of data: Bid Summaries, Call Reports, Bank Data & Statistics section of the FDIC website

²³ Asset premium is scaled by total liabilities of the failed bank. Negative value means assets are sold at discount; positive value means assets are sold at premium.

Table C.2 (Continued)**Descriptive Statistics****Panel B: full sample of companies that survived after all filters**

Variable	Mean	STDEV	Min	Max	N
asset premium	-0.1514	0.1121	-0.5570	0.2778	122
deposit premium%	0.0031	0.0087	0.0000	0.0765	122
number of bids	4.9426	4.6520	1.0000	29.0000	122
number of bidders	2.9098	1.8542	1.0000	10.0000	122
same city	0.1066	0.3098	0.0000	1.0000	122
same state	0.7377	0.4417	0.0000	1.0000	122
target size	5.2402	0.5629	3.9731	7.0333	122
relative size	0.6397	2.1130	0.0009	22.4595	121
DIF reserve ratio	-0.0238	0.2850	-0.3900	0.5900	122
state characteristic	9.1393	2.2453	4.2000	16.9000	122
lsa	0.5492	0.4996	0.0000	1.0000	122
lsa/tl	0.4121	0.3855	0.0000	1.0449	122
pre_roa_onequarter	-0.0008	0.0071	-0.0370	0.0202	116
pre_roe_onequarter	-0.0040	0.0569	-0.2827	0.2096	116
pre_roa_halfyear	-0.0003	0.0079	-0.0384	0.0154	116
pre_roe_halfyear	-0.0005	0.0664	-0.2937	0.1319	116
pre_roa_oneyear	-0.0008	0.0090	-0.0466	0.0388	116
pre_roe_oneyear	-0.0076	0.0759	-0.4768	0.2511	116
post_roa_onequarter	0.0047	0.0128	-0.0458	0.0790	122
post_roe_onequarter	0.0418	0.1068	-0.4357	0.7187	122
post_roa_halfyear	0.0037	0.0177	-0.1197	0.0576	122
post_roe_halfyear	0.0278	0.1382	-0.8487	0.4988	122
post_roa_oneyear	-0.0015	0.0276	-0.2619	0.0658	122
post_roe_oneyear	0.0074	0.1884	-1.7957	0.5822	122
a_size	13.4346	1.7099	9.5636	19.5268	100
a_ci	0.7847	0.2982	0.3543	3.0531	100
a_im	0.0880	0.0234	0.0194	0.1673	100
a_eqr	0.1328	0.0632	0.0527	0.4505	100
a_npl	0.0161	0.0147	0.0000	0.0925	100
a_lqr	0.3063	0.1695	0.0601	0.8733	100

Table C.2 shows the descriptive statistics for all independent variables used in our study. Panel B presents the results based on the full sample, which includes all cases after data filtering process. Source of data: Bid Summaries, Call Reports, Bank Data & Statistics section of the FDIC website

Table C.3

Estimated Discounts

Variable	N	STDEV	Mean	Min	25 th Percentile	75 th Percentile	Max
Panel A: sub-sample							
discount ₁	99	0.1191	0.1513	-0.2778	0.0893	0.2100	0.5570
discount ₂	99	0.1231	0.1657	-0.2522	0.0982	0.2260	0.5694
bpg/tl	99	0.1171	0.0757	0.0000	0.0000	0.0997	0.6029
Panel B: full sample							
discount ₁	122	0.1131	0.1485	-0.2778	0.0893	0.1971	0.5570
discount ₂	122	0.1184	0.1666	-0.2522	0.1029	0.2320	0.5694
bpg/tl	122	0.1094	0.0622	0.0000	0.0000	0.0699	0.6029

This table provides the summary statistics of the estimated discounts by two accounting methods, based on 124 whole-bank acquisitions between 2009Q4 and 2013Q1.

Discount is calculated the in following ways:

$$\text{Discount(Premium)}_1\% = \frac{\text{Asset Premium(Discount)} + \text{Deposit Premium}}{\text{Total Liabilites of Failed Bank}}$$

$$\text{Discount(Premium)}_2\% = \frac{\text{Equity}_{t-0.5} - \text{MV}(\text{Equity}_t)}{\text{Total Liabilities of Failed Bank}_{T-0.5}}$$

Table C.4

Correlation Matrix – Regressions of Discount

	1	2	3	4	5	6	7	8
1 number of bids	1							
2 same city	0.0515	1						
3 same state	-0.0874	0.1844	1					
4 relative size	0.0263	0.0028	0.0908	1				
5 DIF reserve ratio	0.2494	-0.1119	-0.1288	0.0648	1			
6 state characteristic	-0.1768	0.204	0.1799	-0.1367	-0.4067	1		
7 lsa	-0.1268	0.1307	-0.0184	-0.0882	-0.3562	0.2685	1	
8 lsa/tl	-0.1318	0.1578	0.026	-0.0845	-0.3774	0.2768	0.9751	1

This table contains correlation matrix of all relevant variables in Equation 1, based on sub-sample.

Table C.5
Factors Influencing Discount
Panel A: Results for Discount Calculated by Method 1

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	discount₁	discount₁	discount₁	discount₁	discount₁	discount₁	discount₁
same city ²⁴	0.0237 (0.901)	0.0195 (0.645)	0.0168 (0.539)	0.0337* (1.811)	0.0376* (1.855)	0.0382** (2.620)	0.0424*** (2.860)
state characteristic	-0.0068 (-1.334)	-0.0042 (-0.787)	-0.0042 (-0.802)	0.0009 (0.195)	0.0006 (0.132)	-0.0007 (-0.166)	-0.0010 (-0.224)
number of bids	-0.0033* (-1.708)					-0.0041** (-2.230)	-0.0041** (-2.181)
DIF reserve ratio		0.0229 (0.533)				-0.0231 (-0.580)	-0.0244 (-0.590)
relative size			0.0083*** (4.176)			0.0069*** (3.859)	0.0071*** (4.015)
lsa				-0.1134*** (-4.780)		-0.1188*** (-4.853)	
lsa/tl					-0.1377*** (-4.509)		-0.1459*** (-4.441)
Constant	0.2264*** (4.907)	0.1873*** (4.081)	0.1819*** (4.090)	0.1970*** (5.616)	0.1946*** (5.387)	0.2298*** (6.888)	0.2276*** (6.700)
Observations	99	99	99	99	99	99	99
Adjusted R-squared	-0.002	-0.018	0.006	0.197	0.172	0.225	0.201
F-test (Prob>F)	0.1871	0.7529	0.0004	0.0000	0.0000	0.0000	0.0000

Panel A of Table C.5 provides the OLS regression estimates of discount calculated by method. The results are based on sub-sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

²⁴ Dummy variable “same state” is found insignificant for all regressions.

Table C.5 (Continued)

Panel B: Results for Discount Calculated by Method 2

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	discount₂	discount₂	discount₂	discount₂	discount₂	discount₂	discount₂
same state ²⁵	-0.0366 (-1.544)	-0.0311 (-1.289)	-0.0315 (-1.264)	-0.0374* (-1.802)	-0.0378* (-1.754)	-0.0457** (-2.054)	-0.0459* (-1.979)
state characteristic	-0.0050 (-0.906)	-0.0033 (-0.565)	-0.0018 (-0.310)	0.0024 (0.432)	0.0023 (0.410)	-0.0006 (-0.117)	-0.0007 (-0.142)
number of bids	-0.0049** (-2.442)					-0.0054*** (-2.717)	-0.0054*** (-2.741)
DIF reserve ratio		-0.0077 (-0.177)				-0.0420 (-1.003)	-0.0452 (-1.044)
relative size			0.0075*** (3.722)			0.0063*** (3.388)	0.0064*** (3.513)
lsa				-0.0958*** (-3.689)		-0.1056*** (-3.968)	
lsa/tl					-0.1200*** (-3.698)		-0.1345*** (-3.884)
Constant	0.2338*** (4.896)	0.1946*** (3.997)	0.1765*** (3.638)	0.1901*** (4.602)	0.1880*** (4.466)	0.2446*** (6.539)	0.2437*** (6.431)
Observations	99	99	99	99	99	99	99
Adjusted R-squared	0.010	-0.028	-0.008	0.117	0.108	0.167	0.160
F-test (Prob>F)	0.0746	0.9550	0.0031	0.0010	0.0006	0.0000	0.0000

Panel B of Table C.5 provides the OLS regression estimates of discount calculated by method 2. The results are based on sub-sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

²⁵ Dummy variable “same city” is found insignificant for all regressions.

Table C.6

Descriptive Statistics of the Bargain Purchase Gain in FDIC-Assisted Mergers and Non-FDIC-Assisted Mergers

bpg/tl	N	Mean	Std. Dev.	Min	Max	Frequency
FDIC-Assisted (Sub)	99	0.0756533*** (-5.11)	0.117126	0	0.6029459	60.61%
FDIC-Assisted (Full)	122	0.0621629*** (-4.69)	0.1094112	0	0.6029459	50.00%
Non-FDIC-Assisted	316	0.012681	0.065041	0	0.858112	13.29%

Table C.6 shows the descriptive statistics of the BPG reported by the acquirers in the FDIC-assisted and non-FDIC-assisted mergers. Sampling period is from 2009Q4 to 2013Q1. BPG information comes from Call Reports. *** = Significantly different from BPG/TL of acquirers in non-FDIC-assisted mergers at 99% confidence level. Test statistics are in parenthesis. The detailed tests for difference in means are listed in Table 6(continued).

Table C.6 (Continued)

Test for Difference in Mean

Panel A: test for difference between the mean of the FDIC-assisted sample (sub) and the mean of the non-assisted sample, at 1% significance level

	<i>bpg/tl (non-assisted)</i>	<i>bpg/tl (assisted-sub)</i>
Mean	0.012680937	0.075653309
Known Variance	0.00423	0.013718
Observations	316	99
Hypothesized Mean Difference	0	
z	-5.108545014	
P(Z<=z) one-tail	1.62325E-07	
z Critical one-tail	2.326347874	
P(Z<=z) two-tail	3.24649E-07	
z Critical two-tail	2.575829304	

Panel B: test for difference between the mean of the FDIC-assisted sample (full) and the mean of the non-assisted sample, at 1% significance level

	<i>bpg/tl (non-assisted)</i>	<i>bpg/tl (assisted-full)</i>
Mean	0.012680937	0.062162919
Known Variance	0.00423	0.011971
Observations	316	122
Hypothesized Mean Difference	0	
z	-4.685889843	
P(Z<=z) one-tail	1.39373E-06	
z Critical one-tail	2.326347874	
P(Z<=z) two-tail	2.78746E-06	
z Critical two-tail	2.575829304	

Table C.7
Correlation Matrix – Regressions of Bargain Purchase Gain

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. bpg/tl	1												
2. number of bids	-0.2239	1											
3. same city	-0.0683	0.0515	1										
4. same state	0.049	-0.0874	0.1844	1									
5. relative size	-0.0896	0.0263	0.0028	0.0908	1								
6. state characteristic	-0.0241	-0.1768	0.204	0.1799	-0.1367	1							
7. DIF reserve ratio	0.0308	0.2494	-0.1119	-0.1288	0.0648	-0.4067	1						
8. pre_roa_onequarter	0.0258	0.1061	0.072	-0.0168	-0.2923	0.1288	-0.0537	1					
9. pre_roe_onequarter	0.0614	0.1102	0.0614	0.0232	-0.0305	0.1656	-0.0542	0.8565	1				
10. pre_roa_halfyear	0.0774	0.0095	0.1313	-0.1119	-0.3775	0.0255	-0.0353	0.664	0.5791	1			
11. pre_roe_halfyear	0.0988	0.0224	0.0129	-0.1022	-0.0558	-0.0493	-0.0166	0.4786	0.6289	0.8608	1		
12. pre_roa_oneyear	-0.0016	-0.0617	0.1966	0.0364	-0.4381	0.1543	0.0543	-0.0586	0.0793	0.192	0.2027	1	
13. pre_roe_oneyear	-0.0234	-0.0601	0.223	0.0619	-0.0772	0.0556	0.1007	-0.1125	0.0988	0.0783	0.2187	0.896	1

This table contains the correlation matrix of all relevant variables in Equation 2, based on sub-sample. Variables are defined in the Appendix A: Data Definition.

Table C.8

**Tobit Estimation of Factors Influencing Bargain Purchase Gains Reported by Acquirers in the
FDIC-Assisted Mergers**

VARIABLES	(1) bpg/tl	(2) bpg/tl	(3) bpg/tl	(4) bpg/tl	(5) bpg/tl	(6) bpg/tl
number of bids	-0.0118*** (-2.81)	-0.0123*** (-2.94)	-0.0117*** (-2.79)	-0.0117*** (-2.82)	-0.0116*** (-2.78)	-0.0116*** (-2.77)
same city	-0.0202 (-0.33)	-0.0181 (-0.30)	-0.0274 (-0.45)	-0.0190 (-0.32)	-0.0148 (-0.24)	-0.0148 (-0.24)
state characteristic	-0.0028 (-0.32)	-0.0038 (-0.43)	-0.0020 (-0.22)	-0.0015 (-0.17)	-0.0024 (-0.27)	-0.0026 (-0.30)
DIF reserve ratio	0.0866 (1.29)	0.0876 (1.31)	0.0859 (1.29)	0.0881 (1.32)	0.0890 (1.31)	0.0883 (1.30)
relative size	-0.0276 (-0.86)	-0.0313 (-0.97)	-0.02915 (-0.90)	-0.0322 (-0.98)	-0.0307 (-0.97)	-0.0308 (-0.96)
pre_roa_onequarter	1.9090 (0.66)					
pre_roe_onequarter		0.5786 (1.58)				
pre_roa_halfyear			2.4263 (0.91)			
pre_roe_halfyear				0.3631 (1.26)		
pre_roa_oneyear					-0.8366 (-0.31)	
pre_roe_oneyear						-0.0861 (-0.27)
Constant	0.1258 (1.46)	0.1371 (1.61)	0.1163 (1.35)	0.1119 (1.31)	0.1217 (1.40)	0.1230** (1.42)
Observations	99	99	99	99	99	99
sigma	0.1595	0.1583	0.1591	0.1583	0.1595	0.1595
Pseudo R2	0.7658	0.8992	0.7902	0.8383	0.7442	0.7427
Prob>chi2	0.0588	0.0268	0.0511	0.0385	0.0665	0.0671

Table C.8 presents the Tobit regression estimates of BPG/TL for the FDIC-assisted mergers. The independent variables are defined in the Appendix A: Data Definitions. T-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.9

Tobit Estimation of Factors Influencing Bargain Purchase Gains Reported by Acquirers in the Non-FDIC-Assisted Mergers

VARIABLES	(1) bpg/tl	(2) bpg/tl	(3) bpg/tl	(4) bpg/tl	(5) bpg/tl	(6) bpg/tl
same city	0.0888 (1.24)	0.0897 (1.24)	0.00863 (1.20)	0.0866 (1.19)	0.0583 (0.69)	0.0803 (0.96)
state characteristic	0.0277** (2.14)	0.0278** (2.14)	0.0255** (1.97)	0.0254* (1.95)	0.0251* (1.82)	0.0253* (1.83)
relative size	-0.0443 (-1.07)	-0.0430 (-1.03)	-0.0382 (-0.94)	-0.0389 (-0.95)	-0.0769 (-1.31)	-0.0435 (-0.97)
DIF reserve ratio	-0.0399 (0.52)	0.0398 (0.52)	0.0323 (0.42)	-0.0324 (0.42)	0.0052 (0.06)	0.0083 (0.10)
pre_roa_onequarter	0.0109 (0.27)					
pre_roe_onequarter		-0.0004 (-0.13)				
pre_roa_halfyear			0.0146 (0.56)			
pre_roe_halfyear				0.0008 (0.45)		
pre_roa_oneyear					0.0362 (1.34)	
pre_roe_oneyear						0.0008 (0.37)
Constant	0.4884*** (-3.88)	0.2385*** (3.87)	-0.4762*** (-3.78)	-0.4741*** (-3.76)	-0.4753*** (-3.58)	-0.4887*** (-3.64)
Observations	297	297	295	295	288	288
sigma	0.2377	0.2385	0.2374	0.2379	0.2491	0.2511
Pseudo R2	0.0477	0.0474	0.0447	0.0439	0.0518	0.0392
Prob>chi2	0.2330	0.2372	0.2781	0.2885	0.2088	0.3667

Table C.9 presents the Tobit regression estimates of determinants of BPG/TL for the non-FDIC-assisted mergers. Number of bids is not included in the independent variable list due to lack of information. The independent variables are defined in the Appendix A: Data Definitions. T-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.10
Effect of Discount on Post-Merger Profitability Change of Acquirers

Panel A: Post-Merger ROA Change

VARIABLES	(1) post_roa_onequarter	(2) post_roa_onequarter	(3) post_roa_halfyear	(4) post_roa_halfyear	(5) post_roa_oneyear	(6) post_roa_oneyear
a_size	-0.0015*** (-2.977)	-0.0015*** (-2.902)	-0.0015** (-2.019)	-0.0014* (-1.843)	-0.0011* (-1.796)	-0.0010* (-1.689)
a_ci	0.0057** (2.207)	0.0062** (2.312)	0.0096*** (3.385)	0.0100*** (3.436)	0.0084** (2.466)	0.0086** (2.576)
a_im	-0.0229 (-0.612)	-0.0144 (-0.384)	0.0044 (0.083)	0.0109 (0.218)	-0.0182 (-0.387)	-0.0144 (-0.325)
a_eqr	0.0213 (1.280)	0.0223 (1.250)	0.0039 (0.196)	0.0061 (0.296)	0.0266 (0.882)	0.0288 (0.923)
a_npl	0.0808 (1.221)	0.0665 (1.060)	-0.0899 (-0.702)	-0.1045 (-0.789)	0.0548 (0.822)	0.0439 (0.684)
a_lqr	-0.0085 (-1.505)	-0.0086 (-1.461)	-0.0062 (-0.876)	-0.0064 (-0.922)	-0.0020 (-0.278)	-0.0023 (-0.311)
discount₁	0.0271** (2.452)		0.0349** (2.394)		0.0295* (1.716)	
discount₂		0.0211* (1.978)		0.0303** (2.085)		0.0268 (1.635)
Constant	0.0171* (1.821)	0.0160* (1.729)	0.0137 (1.054)	0.0118 (0.875)	0.0055 (0.502)	0.0036 (0.337)
N	99	99	99	99	99	99
Adjusted R2	0.381	0.344	0.340	0.320	0.346	0.334
F-test (Prob>F)	0.0000	0.0000	0.0000	0.0000	0.0001	0.0001

Panel A of Table C.10 provides the OLS regression estimates of post-merger ROA change for different time periods (one quarter, half year and one year). The results are based on sub-sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.10 (Continued)

Panel B: Post-Merger ROE Change

VARIABLES	(1) post_roe_onequarter	(2) post_roe_onequarter	(3) post_roe_half_year	(4) post_roe_half_year	(5) post_roe_oneyear	(6) post_roe_oneyear
a_size	-0.0167*** (-3.410)	-0.0163*** (-3.319)	-0.0155** (-2.230)	-0.0145** (-2.029)	-0.0107** (-2.031)	-0.0100* (-1.930)
a_ci	-0.0449** (-2.211)	-0.0422** (-2.072)	-0.0074 (-0.315)	-0.0062 (-0.267)	-0.0238 (-0.786)	-0.0226 (-0.767)
a_im	-0.3156 (-0.912)	-0.2658 (-0.774)	0.0228 (0.049)	0.0518 (0.116)	-0.3000 (-0.959)	-0.2720 (-0.925)
a_eqr	-0.0593 (-0.522)	-0.0507 (-0.452)	-0.1839 (-1.205)	-0.1639 (-1.109)	0.0187 (0.162)	0.0349 (0.293)
a_npl	0.5948 (1.006)	0.5046 (0.878)	-1.5720 (-1.149)	-1.6631 (-1.188)	0.2826 (0.457)	0.2026 (0.337)
a_lqr	-0.0244 (-0.455)	-0.0250 (-0.460)	-0.0251 (-0.447)	-0.0274 (-0.509)	0.0144 (0.334)	0.0126 (0.291)
discount₁	0.1827** (2.172)		0.2569** (2.153)		0.2167 (1.388)	
discount₂		0.1478* (1.833)		0.2364* (1.973)		0.1969 (1.324)
Constant	0.3066*** (3.589)	0.2985*** (3.513)	0.2635** (2.129)	0.2464* (1.914)	0.1745* (1.779)	0.1606* (1.692)
N	99	99	99	99	99	99
Adjusted R2	0.208	0.185	0.276	0.267	0.173	0.160
F-test (Prob>F)	0.0223	0.0323	0.0005	0.0008	0.1106	0.1009

Panel B of Table C.10 provides the OLS regression estimates of post-merger ROE change for different time periods (one quarter, half year and one year). The results are based on sub-sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.11
Factors Influencing Discount – Robustness Test

VARIABLES	(1)	(2)	(3)	(4)
	discount₁	discount₁	discount₂	discount₂
same city	0.0285** (2.195)	0.0270* (1.832)	0.0091 (0.449)	0.0087 (0.415)
state characteristic	0.0012 (0.309)	0.0011 (0.294)	0.0028 (0.599)	0.0029 (0.613)
number of bids	-0.0039** (-2.183)	-0.0039** (-2.151)	-0.0044** (-2.312)	-0.0045** (-2.354)
DIF reserve ratio	-0.0084 (-0.242)	-0.0097 (-0.269)	-0.0291 (-0.755)	-0.0330 (-0.844)
relative size	0.0065*** (3.238)	0.0066*** (3.135)	0.0061*** (2.988)	0.0061*** (2.920)
lsa	-0.1208*** (-5.452)		-0.1019*** (-4.157)	
lsa/tl		-0.1498*** (-4.948)		-0.1326*** (-4.154)
Constant	0.2159*** (6.983)	0.2117*** (6.817)	0.2133*** (5.518)	0.2110*** (5.499)
Observations	121	121	121	121
R-squared	0.2882	0.2625	0.1904	0.1873
F-test (Prob>F)	0.0000	0.0000	0.0000	0.0000

Table C.11 provides the OLS regression estimates of discount₁ and discount₂ based on the full sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.12**Factors Influencing Bargain Purchase Gains for the FDIC-Assisted Mergers – Robustness Test**

VARIABLES	(1) bpg/tl	(2) bpg/tl	(3) bpg/tl	(4) bpg/tl	(5) bpg/tl	(6) bpg/tl
number of bids	-0.0056** (-2.489)	-0.0058** (-2.587)	-0.0055** (-2.457)	-0.0055** (-2.499)	-0.0054** (-2.408)	-0.0054** (-2.407)
same city	-0.0046 (-0.126)	-0.0047 (-0.131)	-0.0094 (-0.256)	-0.0057 (-0.156)	-0.0046 (-0.124)	-0.0055 (-0.147)
state characteristic	-0.0022 (-0.424)	-0.0028 (-0.542)	-0.0016 (-0.301)	-0.0014 (-0.265)	-0.0020 (-0.393)	-0.0020 (-0.383)
relative size	-0.0034 (-0.695)	-0.0042 (-0.888)	-0.0024 (-0.486)	-0.0038 (-0.820)	-0.0038 (-0.771)	-0.0041 (-0.877)
DIF reserve ratio	0.0473 (1.207)	0.0467 (1.200)	0.0467 (1.195)	0.0481 (1.239)	0.0467 (1.181)	0.0464 (1.179)
pre_roa_onequarter	1.0527 (0.708)					
pre_roe_onequarter		0.2343 (1.308)				
pre_roa_halfyear			1.5011 (1.106)			
pre_roe_halfyear				0.2275 (1.503)		
pre_roa_oneyear					0.2853 (0.237)	
pre_roe_oneyear						0.0487 (0.359)
Constant	0.1175** (2.334)	0.1246** (2.467)	0.1104** (2.204)	0.1092** (2.190)	0.1147** (2.280)	0.1145** (2.281)
Observations	115	115	115	115	115	115
sigma	0.1686	0.1670	0.1675	0.1664	0.1690	0.1690
Pseudo R2	0.3329	0.4073	0.3686	0.3989	0.3094	0.3126
Prob>chi2	0.0553	0.0197	0.0340	0.0222	0.0755	0.0724

Table C.12 provides the Tobit regression estimates of determinants of BPG/TL reported by the assisted acquirers, based on the full sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.13

Effect of Discount on Post-Merger Profitability Change of Acquirers – Robustness Test

Panel A: Post-Merger ROA Change

VARIABLES	(1) post_roa_onequarter	(2) post_roa_halfyear	(3) post_roa_oneyear	(4) post_roa_onequarter	(5) post_roa_halfyear	(6) post_roa_oneyear
a_size	-0.0015*** (-2.897)	-0.0014* (-1.890)	-0.0011* (-1.797)	-0.0014*** (-2.821)	-0.0013* (-1.703)	-0.0010* (-1.683)
a_ci	0.0058** (2.271)	0.0098*** (3.446)	0.0084** (2.462)	0.0063** (2.393)	0.0102*** (3.526)	0.0086** (2.577)
a_im	-0.0235 (-0.630)	0.0033 (0.064)	-0.0182 (-0.386)	-0.0150 (-0.402)	0.0099 (0.199)	-0.0144 (-0.325)
a_eqr	0.0205 (1.251)	0.0027 (0.137)	0.0267 (0.891)	0.0215 (1.218)	0.0048 (0.236)	0.0288 (0.930)
a_npl	0.0925 (1.512)	-0.0710 (-0.591)	0.0535 (0.872)	0.0796 (1.356)	-0.0842 (-0.674)	0.0439 (0.744)
a_lqr	-0.0086 (-1.525)	-0.0063 (-0.896)	-0.0020 (-0.276)	-0.0087 (-1.484)	-0.0065 (-0.945)	-0.0023 (-0.310)
discount₁	0.0273** (2.474)	0.0353** (2.380)	0.0295* (1.715)			
discount₂				0.0213** (1.989)	0.0306** (2.066)	0.0268 (1.635)
Constant	0.0165* (1.761)	0.0128 (0.962)	0.0055 (0.505)	0.0154* (1.662)	0.0108 (0.780)	0.0036 (0.336)
N	100	100	100	100	100	100
R-squared	0.379	0.337	0.347	0.340	0.316	0.335

Panel A of Table C.13 provides the OLS regression estimates of post-merger ROA change for different time periods (one quarter, half year and one year). The results are based on full sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.13 (Continued)

Panel B: Post-Merger ROE Change

VARIABLES	(1) post_roe_onequarter	(2) post_roe_halfyear	(3) post_roe_oneyear	(4) post_roe_onequarter	(5) post_roe_halfyear	(6) post_roe_oneyear
a_size	-0.0163*** (-3.308)	-0.0147** (-2.037)	-0.0108** (-2.014)	-0.0158*** (-3.214)	-0.0137* (-1.831)	-0.0100* (-1.909)
a_ci	-0.0435** (-2.131)	-0.0050 (-0.214)	-0.0240 (-0.792)	-0.0407** (-1.991)	-0.0037 (-0.157)	-0.0227 (-0.771)
a_im	-0.3234 (-0.932)	0.0096 (0.020)	-0.2989 (-0.959)	-0.2730 (-0.793)	0.0398 (0.090)	-0.2715 (-0.924)
a_eqr	-0.0683 (-0.609)	-0.1993 (-1.310)	0.0200 (0.176)	-0.0604 (-0.544)	-0.1799 (-1.231)	0.0356 (0.303)
a_npl	0.7368 (1.322)	-1.3303 (-1.025)	0.2618 (0.463)	0.6552 (1.196)	-1.4130 (-1.059)	0.1916 (0.349)
a_lqr	-0.0255 (-0.477)	-0.0270 (-0.479)	0.0146 (0.337)	-0.0262 (-0.484)	-0.0294 (-0.545)	0.0127 (0.292)
discount₁	0.1855** (2.205)	0.2617** (2.117)	0.2163 (1.386)			
discount₂				0.1500* (1.851)	0.2401* (1.934)	0.1967 (1.322)
Constant	0.3000*** (3.499)	0.2522* (1.959)	0.1755* (1.772)	0.2913*** (3.418)	0.2344* (1.742)	0.1611* (1.683)
N	100	100	100	100	100	100
R-squared	0.204	0.267	0.175	0.180	0.258	0.163

Panel B of Table C.13 provides the OLS regression estimates of post-merger ROE change for different time periods (one quarter, half year and one year). The results are based on full sample. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.14
Factors Influencing Discount – Robustness Test 2

VARIABLES	(1)	(2)	(3)	(4)
	discount1	discount1	discount2	discount2
same city	0.0421*** (3.196)	0.0435*** (3.095)		
same state			-0.0423 (-1.450)	-0.0355 (-1.196)
state characteristic	-0.0001 (-0.031)	-0.0007 (-0.140)	0.0013 (0.230)	0.0006 (0.109)
pre_roa_halfyear	0.5536 (0.429)	0.7824 (0.603)	0.4964 (0.379)	0.7464 (0.559)
number of bids	-0.0038** (-2.012)	-0.0040** (-2.033)	-0.0051** (-2.446)	-0.0052** (-2.543)
DIF reserve ratio	-0.0236 (-0.593)	-0.0247 (-0.602)	-0.0502 (-1.181)	-0.0514 (-1.177)
relative size	0.0063 (0.288)	-0.0017 (-0.072)	0.0226 (0.813)	0.0147 (0.508)
lsa	-0.1190*** (-4.953)		-0.1092*** (-4.244)	
lsa/tl		-0.1454*** (-4.495)		-0.1348*** (-3.976)
Constant	0.2243*** (6.046)	0.2278*** (5.789)	0.2579*** (6.108)	0.2582*** (5.912)
Observations	96	96	96	96
F-test (Prob>F)	0.0000	0.0000	0.0004	0.0009
Adjusted R-squared	0.191	0.164	0.155	0.140

Table C.14 provides the OLS regression estimates of $discount_1$ and $discount_2$ after we exclude extreme cases in which the relative size is larger than or equal to two. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table C.15
Factors Influencing Discount – Robustness Test 3
Panel A: 2009Q4 to 2010Q4 Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)
	discount1	discount1	discount1	discount3	discount3	discount3
same city	0.0380*		0.0470*	0.0132		0.0231
	(1.989)		(1.885)	(0.399)		(0.657)
same state		-0.0057			-0.0383	
		(-0.198)			(-0.842)	
state characteristic	0.0065	0.0072	0.0061	0.0050	0.0063	0.0050
	(1.360)	(1.458)	(1.103)	(0.760)	(0.947)	(0.702)
pre_roa_halfyear	0.2361	-0.0401	0.2551	0.4887	-0.2317	0.5752
	(0.170)	(-0.026)	(0.165)	(0.297)	(-0.125)	(0.313)
number of bids	-0.0118**	-0.0124***	-0.0109**	-0.0169***	-0.0169***	-0.0162***
	(-2.531)	(-2.737)	(-2.420)	(-2.885)	(-2.984)	(-2.938)
DIF reserve ratio	-0.1525	-0.1463	-0.1541	-0.1361	-0.1749	-0.1415
	(-1.363)	(-1.227)	(-1.290)	(-0.898)	(-1.227)	(-0.943)
relative size	-0.0152	-0.0156	-0.0202	0.0051	0.0057	-0.0002
	(-0.566)	(-0.557)	(-0.661)	(0.125)	(0.139)	(-0.005)
lsa	-0.1689***	-0.1661***		-0.1572***	-0.1547***	
	(-5.818)	(-5.870)		(-4.034)	(-4.262)	
lsa/tl			-0.2027***			-0.1997***
			(-5.289)			(-4.264)
Constant	0.1885***	0.1936***	0.1804***	0.2398***	0.2463***	0.2344***
	(5.043)	(5.095)	(4.232)	(4.408)	(4.237)	(3.993)
Observations	45	45	45	45	45	45
F-test (Prob > F)	0.0000	0.0000	0.0000	0.0002	0.0004	0.0000
Adjusted R-squared	0.481	0.465	0.417	0.319	0.334	0.318

Table C.15 provides the OLS regression estimates of discount₁ and discount₂ after we exclude cases in which the relative size is larger than or equal to two and split the sample into two according to the DIF reserve ratio variation. Panel A shows the results for the first half period, 2009Q4 to 2010Q4. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.15 (continued)
Factors Influencing Discount – Robustness Test 3
Panel B: 2011Q1 to 2013Q1 Results

VARIABLES	(1) discount1	(2) discount1	(3) discount1	(4) discount3	(5) discount3	(6) discount3
same city	0.0348 (1.257)		0.0257 (0.907)	0.0264 (0.919)		0.0182 (0.621)
same state		-0.0462 (-1.623)			-0.0453* (-1.690)	
state characteristic	-0.0111 (-1.291)	-0.0089 (-0.988)	-0.0127 (-1.444)	-0.0105 (-1.236)	-0.0083 (-0.980)	-0.0118 (-1.373)
pre_roa_halfyear	1.1793 (0.452)	1.8727 (0.785)	1.7497 (0.688)	0.9173 (0.381)	1.4934 (0.674)	1.4413 (0.612)
number of bids	-0.0033 (-1.500)	-0.0034 (-1.649)	-0.0035 (-1.565)	-0.0033 (-1.589)	-0.0035* (-1.789)	-0.0035 (-1.643)
DIF reserve ratio	-0.1176 (-1.186)	-0.1377 (-1.481)	-0.1240 (-1.227)	-0.1093 (-1.151)	-0.1288 (-1.434)	-0.1146 (-1.184)
relative size	-0.0071 (-0.197)	0.0050 (0.128)	-0.0213 (-0.575)	-0.0186 (-0.529)	-0.0064 (-0.171)	-0.0317 (-0.870)
lsa	-0.0850** (-2.677)	-0.0896*** (-2.889)		-0.0761** (-2.520)	-0.0808*** (-2.781)	
lsa/tl			-0.1034** (-2.494)			-0.0913** (-2.327)
Constant	0.3341*** (3.797)	0.3549*** (4.181)	0.3512*** (3.778)	0.3318*** (3.862)	0.3523*** (4.381)	0.3466*** (3.830)
Observations	51	51	51	51	51	51
F-test (Prob > F)	0.0000	0.0000	0.0002	0.0041	0.0015	0.0104
Adjusted R-squared	0.020	0.039	0.007	0.004	0.025	-0.009

Table C.15 provides the OLS regression estimates of discount₁ and discount₂ after we exclude cases in which the relative size is larger than or equal to two and split the sample into two according to the DIF reserve ratio variation. Panel B shows the results for the second half period, 2011Q1 to 2013Q1. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table C.16

**Factors Influencing Bargain Purchase Gains for the FDIC-Assisted Mergers –
Robustness Test 3**

VARIABLES	2009Q4 to 2010Q4		2011Q1 to 2013Q1	
	bpg/tl	bpg/tl	bpg/tl	bpg/tl
1.same city	-0.0272 (-0.436)		-0.0065 (-0.061)	
1.same state		-0.0006 (-0.011)		-0.0409 (-0.674)
state characteristic	-0.0066 (-0.697)	-0.0072 (-0.743)	-0.0082 (-0.472)	-0.0065 (-0.372)
pre_roa_onequarter	3.9935 (1.159)	4.0864 (1.180)	3.1768 (0.594)	3.8028 (0.699)
number of bids	-0.0268** (-2.582)	-0.0265** (-2.537)	-0.0096** (-2.089)	-0.0105** (-2.177)
DIF reserve ratio	-0.0945 (-0.485)	-0.1049 (-0.510)	-0.2322* (-1.739)	-0.2473* (-1.833)
relative size	0.0585 (0.906)	0.0595 (0.917)	-0.0098 (-0.115)	-0.0003 (-0.004)
lsa/tl	0.0477 (0.735)	0.0433 (0.674)	-0.1087 (-1.552)	-0.1123 (-1.606)
Constant	0.0887 (0.817)	0.0889 (0.816)	0.2758 (1.557)	0.2985 (1.673)
Observations	45	45	51	51
sigma	0.1274***	0.1279***	0.1564***	0.1558***
Pseudo R2	3.6028	3.544	2.5036	2.6227
Prob>chi2	0.1133	0.1205	0.2208	0.1932

Table C.16 provides the Tobit regression estimates of determinants of BPG/TL after we exclude cases in which the relative size is larger than or equal to two and split the sample into two according to the DIF reserve ratio variation.. The independent variables are defined in the Appendix A: Data Definitions. Robust t-statistics are listed below each coefficient in parentheses. *** p<0.01, ** p<0.05, * p<0.1