REAL ESTATE ECONOMICS

An Analysis of Resolution Trust Corporation Transactions: Auction Market Process and Pricing

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This article describes the operations of the Resolution Trust Corporation (RTC), examines the procedures it employs to resolve distressed Savings and Loan scenarios and investigates the pricing of transactions undertaken by the RTC. The RTC has been criticized for allegedly transferring properties to acquirers at "bargain" prices. The transactions involving publicly traded acquirers in RTC sales are examined from an auction theory perspective. Overall, there is little evidence that winning bidders experience stock price gains. There are, however, subsets of bidders for which the outcomes are predominantly negative. The only category of transactions which provide statistically significant gains to acquirers are Insured Deposit Transfers.

The Resolution Trust Corporation (RTC) is a significant institution in the recent history of the United States financial system. It has had as many as 7,000 employees and has been considered to be the largest real estate owner in the country. During the first three and a half years of its existence it took control of 737 failed thrifts and acquired assets with a book value of $434 billion. The RTC took over the role of resolving the problems of insolvent Savings and Loans (S&Ls) from the Federal Savings and Loan Insurance Corporation (FSLIC) in August 1989, after its creation by the passage of the Financial Institutions Reform, Recovery, and Enforcement Act (FIRREA).

Several "sales" of failed thrifts by the FSLIC in late 1988 became controversial. The S&L insurance fund had few resources, and "regulators could only promise future assistance payments and tax breaks to attract buyers."[1] The future assistance primarily took the form of assured returns to buyers. Specified or covered assets carried a "yield maintenance" provision, and an assured return, often in the form of management fees. This structure of returns provided little incentive to improve (or even complete

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[1] *The Wall Street Journal*, July 10, 1991.

the development of) covered assets.[2] Additionally, as has been found in some of the S&L controversy, there were interesting political intonations.[3]

The RTC is charged with the management and disposition of assets, liabilities and operations assumed from failed S&Ls. This role is critical because of its influence on the ultimate cost of the S&L industry's problems to taxpayers, and the degree of efficiency in the redeployment of assets and operations from distressed thrifts. The importance of pricing outcomes of RTC asset sales is apparent from the scale of operations. Approximately $500 billion of assets came to be involved in RTC operations.

Sales practices employed by the RTC have generated considerable controversy in the areas of sales mechanisms, pricing outcomes and administrative processes.[4] The RTC has been harshly criticized for practices such as the random selection of eligible bidders and inadvertent sales of particular properties to more than one bidder. The level of attention paid to the RTC's practices and pricing of transactions is not surprising given the public policy issues associated with an operation of this scale and the controversy surrounding a number of large transactions undertaken by the FSLIC in the period preceding the creation of the RTC.

The purpose of this article is to systematically review the operations of the institution and to examine the pricing outcomes for subsets of resolutions where another party acquires business interests from the RTC. The analysis provides evidence on the pricing of RTC transactions in both auction and merger and acquisitions contexts.

The paper is structured as follows: The following section reviews the acquisitions literature related to this paper and then the selling practices of the RTC are related to auction theory. After the sample, data and methodology are described, research findings are presented and discussed. The final section presents the conclusion.

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[2] A review of some of these acquisitions revealed that in many cases, ". . . '88 thrifts seem to have decided to play it safe and just collect their fees. " *The Wall Street Journal*, p.1, July 10, 1991.

[3] *The Wall Street Journal*, July 10, 1991, "Buyers of Thrifts Made Big Gifts to Candidates," p. A6.

[4] For example, an article in *Forbes* magazine on October 29, 1990 contended that the RTC was transferring assets at prices reflecting "fire sale" levels.

Background

The background literature for this study includes the *whole-firm acquisitions* literature (*e.g.*, Jensen and Ruback 1983: Jarrell, Brickley and Netter 1988; and Black 1989). The literature indicates that in recent transactions there is little evidence of systematic gains to acquirers, and some evidence of negative results. For particular subsets of bidders, the outcome is predominantly negative.

Another set of related literature is that pertaining to *acquirers in sell-off divestiture transactions*. The findings in studies such as Hite, Owers and Rogers (1987) are that both sellers and acquirers, on average, experience gains and that some of the aggregate increase in value accrues to the acquiring firm, reflected in an increase in their stock price. In the specific case of real estate assets, Glascock, Davidson and Sirmans (1991) investigated the impact of the number of bidders, frequency of acquisition and type of assets transferred for buyers and sellers. Overall, they found that both sellers and buyers gain, but the latter only in the case of infrequent acquisitions. A positive reaction for both parties was more likely when property, rather than a business unit, was being transacted.

Thus, the findings from the general literature on acquisition of whole-firms and business units are varied and do not portend a specific pattern of outcomes for acquirers in RTC transactions. If there is competition among bidders, then, as in the case of whole-firm acquisitions, there may be little if any gain in value for acquirers. In contrast, if the RTC transactions more closely resemble the market process for acquisitions of business *units*, then the process may be anticipated to generate gains to buyers. From the acquirer's perspective, some RTC transactions are similar to whole-firm acquisitions, while others are similar to sell-off divestitures of business units.

Much of the work of the RTC involves the transfer of distressed real estate assets. Crockett (1990) considers the process of managing distressed real estate assets, noting the distinction between distressed assets and distressed markets, and the roles of information asymmetry and incentive structures. Curry, Blalock and Cole (1991) find that the average rate of recovery on distressed commercial real estate assets under FSLIC receiverships in the late 1980s is 64%. The particular rate of recovery for given types of assets was influenced by the local market conditions, difficulty of management and disposition and write-downs prior to the FSLIC takeover. Recognizing the complexity of the process involved in efficiently managing and disposing of large quantities of distressed real estate, Benveniste, Capozza, Kormendi and

Wilhelm (1994) model the process in a principal/agent framework. They examine the standard asset and management agreement (SAMDA), a specific RTC contract, within their general framework for asset and management contracts.

Previous empirical research into the *acquisition of distressed financial institutions* has produced mixed findings. Several studies examine the use of the Purchase and Assumption strategy by the FDIC in the case of failed commercial banks. Giliberto and Varaiya (1989) consider such transactions as first-price, sealed bid auctions and find evidence of winner's curse.[5] Pettway and Trifts (1985) examine the abnormal returns to acquirers in these transactions. They find positive abnormal returns around the merger, followed by a persistent decline over the following 45 days. James and Wier (1987) conclude that prevailing bidders experience gains. Bertin, Ghazanfari and Torabzadeh (1989) examine 37 FDIC transactions over the interval 1983–1987 and find significant positive abnormal returns for acquirers. Balbirer, Jud and Lindahl (1992) examine abnormal return outcomes for acquirers of failed S&Ls in the pre-RTC 1980s, and find evidence of gains to acquirers. Gosnell, Hudgins and MacDonald (1993) compare acquirer outcomes under FSLIC and RTC assisted thrift mergers. They find little evidence of gains to acquirers.

Thus, while there is variation in the findings regarding acquiring firms in these distressed-institution transactions, there is a predominance of positive consequences for acquirers. A primary goal of this article is to investigate whether the valuation outcome for acquirers in RTC-resolution transactions varies with the specific nature and details of the transaction.

Ely and Varaiya (1992) examine the relationship between the structural attributes of RTC transactions and other bids to investigate pricing outcomes. Their analysis "utilizes predictions linking the magnitudes of winning and losing bids with the number of participating bidders and the degree of uncertainty of the thrift's franchise value" to address the issue of whether bidders overpay. They do not find evidence of underpricing by the RTC. This article investigates similar issues to Ely and Varaiya by examining abnormal returns associated with subsets of acquirers rather than relative bid levels as the key metric.

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[5] "Winner's curse" refers to the outcome in which the prevailing/acquiring bidder has paid more that the value of the object acquired. The "winner" is thus "cursed."

The Auction Market Nature of RTC Transactions

Many RTC transactions can be categorized as auctions. Potential bidders attend due diligence informational meetings, and then submit sealed bids for the target assets. In pursuit of its "minimum cost" charter, the RTC has primarily used variants of the English auction and first-price, sealed-bid auction.[6] The transactions analyzed are typically first-price, sealed bid auctions.

Auction theory emphasizes the significance for the outcome of whether the *object* of the auction has the same value to all potential bidders (the *common value* assumption), or whether the object has potentially different values for various bidders (the *independent private value* assumption). McAffee and McMillan (1987) note that these may be interpreted as polar cases. The early formal work in auctions (*e.g.*, Vickrey 1961) assumed independent values between agents. Milgrom and Weber (1982) developed the notion of affiliated/common values and noted the significance of this versus independent private values. Kagel and Levin (1986) note the significant implications of common value auctions, particularly in the context of auctions by federal government agencies. The "winner's curse" has been discussed in the context of mineral lease and oil lease rights auctions where, just as with RTC resolutions, there is a transfer of property rights from government to private sector ownership.

When the assets and/or operations of an insolvent S&L are considered, it is possible that the object of the auction has different value to various bidders. For example, a particular set of S&L operations might have greater *private* value to an acquirer in close geographical proximity. In contrast, a larger, more complete set of operations may have a *common value* to all potential acquirers.[7] Such larger sets of operations likely have fewer attributes uniquely of value to any one potential acquirer. Additionally, the

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[6] See McAffee and McMillan (1987) and Smith (1987) for analysis of the formal structure of auctions.

[7] For example, the common value characteristics of oil leases have frequently been said to generate winner's curse scenarios for prevailing bidders. If this anticipation is applied to acquirers in RTC resolutions, the expectation of NEGATIVE valuation consequences would follow, a prognostication clearly at odds with the claims of "fire sale" prices found in some press reports. For a detailed description of underlying values assumptions in auctions see McAffee and McMillan, p. 720. For a more complete application of these considerations to the RTC, see Ely and Varaiya (1992).

number of bidders and their game theoretic behaviors can affect the outcome.[8]

Given the uncertainty about whether RTC transactions involve private or common value objects and the related bidding strategies, the valuation outcome for bidders is an issue for empirical determination. The pricing outcomes are investigated by examining stock price reactions to announcements of completed transactions.

Risk and Auctions

Uncertainty regarding the value of what is being sold impacts bidding strategies. This intuition has been formalized in the auction literature. Ely and Varaiya (1992), drawing from Capen, Clapp and Campbell (1971) and Kagel and Levin (1986), consider the role of variance of value estimates in formulation of optimal bidding strategy. In developing a model for the asset disposal process by the RTC, Lea and Thygerson (1994) conclude that sale proceeds will be inversely related to the uncertainty of both the value of the property and the sales practices used by the RTC in its disposition. These models all conclude that the greater uncertainty regarding the true value of what is being auctioned, the lower the optimal bid.

The implications for RTC transactions are substantial. Some RTC resolutions are hypothesized to involve assets with a *common value* to all bidders, while others potentially have *private values* across the set of potential bidders. This is depicted in the two columns in Figure 1. For cases where the "object of the auction" has low or zero variance of intrinsic value (row 1), bidders will experience little/no gain if the object has a *common value* to all potential bidders. Conversely, where there is little uncertainty of intrinsic worth, but that worth varies from one bidder to another (Independent Private Value), the bidder for whom intrinsic worth is greatest will experience gains.[9]

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[8] McAfee and McMillan note that a first-price, sealed-bid auction (as typically employed by the RTC) does not have a *dominant equilibrium*, wherein the optimal strategy for each bidder is well-defined regardless of how high he anticipated competing bidders will go. The *Nash equilibrium* (a weaker criterion than the dominant equilibrium) then obtains. In determining his optimal bid, each bidder anticipates as best he can the strategies of competing bidders.

[9] This will follow from a strategy of bidding in the range bounded (below) by the value to the second-highest worth bidder and (above) by the value to the highest private-value bidder.

Figure 1 ■ Implications of the nature and risk of S&L assets transacted for the abnormal return of acquirers.

Implications of the nature (Common Value or Independent Private Value) and risk level of S&L assets transacted for the Abnormal Returns of Acquirers. If there is little risk and uncertainty regarding the value of the target assets, when that value is the same for all bidders (Quadrant I) all will bid close to that common intrinsic value, and no bidder will create value by acquiring the assets. If values differ by acquirer (Quadrant II), the bidder for whom the assets have highest value can make a positive NPV acquisition. When there is considerable uncertainty regarding target asset values (row 2), then if the assets are of the same value to all acquirers (Quadrant IV), winner's curse will likely be experienced by the prevailing bidder. The implications for Quadrant III are indeterminate.

	Common Value	Private Value
Low Risk	*Quadrant I* 0	*Quadrant II* >0
High Risk	<0 *Quadrant IV*	≥0 *Quadrant III*

The implications for acquirers of common value and private value assets where there is high uncertainty regarding their intrinsic value is depicted in row 2 of Figure 1. With high variance in estimating intrinsic worth, when the object has a common value nature bidders will employ strategies to "win" which might lead to overpayment and "winner's curse," and associated declines in stock price as analysts and investors identify the overpayment. While the acquirer prevails in terms of acquiring the object property, it does not win in terms of value creation. Hence, the potential for negative acquirer outcomes in Quadrant IV of Figure 1. In Quadrant III, the outcome is indeterminate, depending on the magnitude of variance of intrinsic worth, the size of the differential values and strategies employed by bidders in order to prevail.

Sample and Methodology

Sample

The sample for the empirical work in this article was identified in the rosters in the quarterly *Mergers and Acquisitions*. Its listing of all activity includes identification of the selling party and specifically identifies the RTC when it is the seller. The sample includes all publicly traded acquirers in RTC transactions with the RTC in 1989 and 1990 subject to minimum data requirements for the methodology.

The RTC provided details of the sale transactions. This includes attributes of the bids and identification of both winning and losing bidders. To be included in the final sample, it was required that firms have complete daily return series for the period -200 to $+100$ days relative to the date of the outcome announcement (day 0) in *The Wall Street Journal*. A number of firms bid in multiple auctions, and when a firm was involved in two transactions within ten trading days, only the first transaction was included. This screen resulted in the exclusion of two transactions.

The event dates were identified by an examination of *The Wall Street Journal* and its *Index* and the *Dow Jones News Retrieval Service*. When necessary, additional announcement details were obtained from *The American Banker*. These sources were also used to screen for the presence of confounding events.

The resulting sample includes 58 successful acquirers and 46 losing bidders. The analysis of the abnormal returns is restricted to these samples. Descriptive statistics for the winning bidders are provided in Table 1. The differences between Exchange-Listed and OTC firms is marked in Panel B, which refers to the absolute size of the transactions. In contrast, the auction attributes and relative sizes reported in Panel A are generally similar for both Exchange-Listed and OTC firms.[10] For some items in Table 1, the averages reported accommodate a wide range of individual outcomes. For example, for Insured Deposit Transfer transactions, the percentage of bids relative to the core deposits being acquired had an average of 2.5% (as in Table 1, Panel A), a median of 1.2%, and a range from 0.0% to 16.6%.

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[10] The Exchange-Listed and OTC subsets were examined separately. There is little differences in abnormal returns between the two subsets, and these findings are not otherwise reported here. The results are available from the authors.

Table 1 ■ Descriptive statistics for auctions of S&Ls by the Resolution Trust Corporation.

Variables	Combined ($n = 58$)	Exchange ($n = 30$)	OTC $n = 28$
Panel A: Attributes			
Number of Bidders	4.5	4.9	4.3
Number of Bids	5.6	5.7	5.5
Bidders Attending[1]	25.8	21.8	29.4
Bidders Conducting Due Diligence	4.7	5.6	3.9
Percentage Bidding (%)[2]	38.2	23.1	51.7
Months S&L was with RTC[3]	9.7	11.0	8.6
Relative Size (%)[4]	11.4	7.5	15.1
Percentage of Assets Acquired (%)[5]	51.4	42.9	59.6
Winning Bid to Core Deposits (%)[6]	2.5	2.1	2.9
Second-highest Winning Bid (%)[7]	43.6	44.1	43.1
Panel B: Size (millions of dollars)			
Winner's Equity	1,857	3,241	373
Assets Acquired	486	717	264
Assets Retained by RTC	771	1,136	406
Winner's Deposits	19,309	35,920	3,884
Total Deposits of S&L	1,313	1,915	710
Deposits Acquired by Winner	955	1,422	454
Core Deposits	980	1,405	555
Liabilities Retained by RTC	280	430	130
RTC Funding[8]	717	1,061	372
Cost of Resolution to RTC[9]	367	556	177

Numbers are means for all winners, Exchange Listed winners and OTC winners (respectively).

[1] Number attending bid conference or requesting a bid package.
[2] Number of Bidders/Bidders Attending × 100.
[3] Data was available for only 38 firms.
[4] Deposits Acquired/Winner's Deposits × 100.
[5] Proportion of S&L's assets acquired by the winner.
[6] Excludes transactions with one bid and in which one or both of the two highest bids were negative.
[7] Only 43 cases where both bids were positive are included.
[8] Estimated cash infusion by the RTC adjusted by bid amount and including RTC advances.
[9] Estimated resolution cost to the RTC after recovery on retained assets and payment to other creditors (net or bid).

Methodology

The Appendix describes the empirical methods. For transactions involving OTC firms the issue of infrequent trading is a concern. A methodology that is similar to Handjinicolaou and Kalay's (1984) was used and multi-day returns calculated for missing return intervals and a returns series for the firm developed. Any firm that had missing returns for five consecutive days in the interval $(-200, +100)$ was removed, resulting in three firms being excluded.[11]

Analysis: Motivation and Findings

Overall Hypotheses: Winners and Losers

In the context of the RTC environment, an important question is whether the sales are effectively more like financial asset transactions (with essentially zero NPV attributes)[12] or real-asset transactions (with non-zero NPVs).[13] As developed in the section on auctions, this will be influenced by whether the assets and/or operations being sold are of common or private value to bidders, and the uncertainty of their value.

The following null hypothesis is posited to investigate the pricing outcomes of RTC transactions for bidders:

Hypothesis: For the successful bidders, acquisitions from the RTC represent zero-NPV outcomes as measured by the stock market response to outcome announcements.

Corollary: In the context of prices such that the acquisitions would have been zero-NPV transactions, losing/unsuccessful bidders experience zero valuation consequences.

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[11] All the tests were also carried out using a bank index as a proxy for the market index. The bank index is a value-weighted index of all exchange-listed banks which were continuously traded in 1989 and 1990. Since the use of the bank index did not result in materially different conclusions, the results are presented only for the CRSP value-weighted index.

[12] For a review of literature pertaining to the risk/return and pricing attributes of financial securities, see Fama (1991).

[13] McConnell and Muscarella examine the valuation consequences of real-asset investment decisions in the context of capital budgeting. The overall conclusion is that, for non-regulated firms, real asset markets systematically generate positive NPV investments which are associated with increases in firm value.

Table 2 ■ Returns to winners and losers in sales of S&Ls by the RTC.

Interval	Winners (n = 58)			Losers (n = 46)		
	CAR (%)	% Positive	Z	CAR (%)	% Positive	Z
−5 to 0	−0.2	52	−1.2	−0.3	48	−0.8
−2 to 0	−0.4	53	−1.9*	−0.1	48	−0.3
−1 to 0	−0.2	48	−0.8	0.4	54	1.0
−2	−0.2	45	−2.2**	−0.4	43	−1.9*
−1	−0.4	47	−1.3	−0.2	46	−0.0
0	0.2	53	0.1	0.5	48	1.4
+1 to +5	−0.5	40	−1.6	−0.5	54	−1.4
−5 to +5	−0.7	43	−2.0*	−0.8	41	−1.5

Mean cumulative abnormal returns (CARs), percentage of positive returns and the Z-statistic over various intervals around the announcement date. The CRSP value-weighted index was used as a proxy for the market.

*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

The Findings. Table 2 reports the results for the 58 successful bidders ("winners") and the 46 unsuccessful bidders ("losers"). In Table 2 there is no evidence that the winning bidders have acquired the assets at bargain prices. The abnormal return (AR) over (−2,0) is −0.4% (Z = −1.9). Table 2 reports a significant negative reaction on day −2. There was considerable discussion about anticipated auction results, and it appears that the market anticipated on day −2 the outcome reported on day −1.[14]
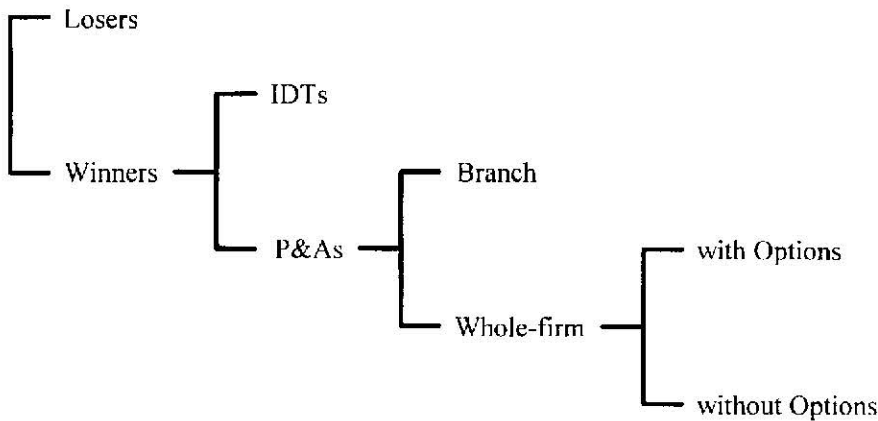
The hypothesis of zero abnormal returns for winning bidders is therefore rejected. Although the AR over (−2,0) is significantly different from zero only at the 10% level, there is an indication that prevailing bidders experience negative valuation consequences.[15] This contrasts with references

[14] This pattern motivated a close examination of the information dissemination process associated with the transactions, but we did not identify anything other than the day −2 market reaction. However, the pervasiveness of the day −2 reaction leads to the focus on the interval (−2,0) for interpreting the results.

[15] This bears an interesting similarity to another public policy scenario. With safe harbor leasing, there were many claims (including Congressional Reports) of windfalls to acquirers of tax shields. In contrast to these claims, Owers and Rogers (1985) found empirical evidence of negative valuation outcomes for prevailing buyers. The market considered that acquirers of tax shields were paying more for them than their worth.

Figure 2 ■ Subsamples of bidders in RTC transactions.

The specified partitions are based on the different characteristics of the resulting subsets.

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┌── Losers
│
│          ┌── IDTs
│          │
└── Winners┤              ┌── Branch
           │              │
           └── P&As ──────┤                        ┌── with Options
                          │                        │
                          └── Whole-firm ──────────┤
                                                   │
                                                   └── without Options
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to "fire sale" press reports, and the empirical findings of some earlier studies of non-RTC government resolutions.[16] However, it is consistent with the results of studies examining the recent experience of acquirers in whole-firm acquisitions and those of Gosnell, Hudgins and MacDonald (1993).

Presumably the failure to succeed in acquiring assets from the RTC will have no negative effect if the acquisition did not represent a positive NPV opportunity. Table 2 shows little evidence that losers incurred a significant opportunity cost as a result of failing to prevail in the S&L acquisition. These findings generally support the corollary of zero valuation consequences for losing bidders.

In combination, the negative returns for "winners" and zero abnormal returns for losers does not support the notion that RTC transactions offered acquirers windfall gains. There is no overall evidence that the RTC systematically transacts at prices which generate significant gains for acquirers. The RTC has a "least cost" mandate for executing its transactions, and the findings indicate that goal was achieved for the *overall* sample. Next, that result is examinded to see if it holds for the various subsamples of prevailing bidders identified in Figure 2. This figure shows the relationship between the various subsamples of bidders, and the partitions of acquirers are motivated by the characteristics of the resulting subsets of transactions.[17]

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[16] See Pettway and Trifts (1985), James and Weir (1987), and Bertin, Ghazanfari and Torabzadeh (1989), which are referenced in the literature review.

[17] Chi-square tests established that the various (specified) partitioning attributes are not systematically related.

IDTs versus P&As

RTC resolutions can take one of three primary forms: (1) the sale of assets (purchase and assumption or P&A); (2) the transfer of insured deposits (IDT); and (3) payouts to insured depositors. The analysis in this article provides evidence on the valuation impact for acquirers in the P&A and IDT transactions.

The most complex resolution transactions are P&As, wherein an acquirer (typically another financial institution) assumes operations from the failed thrift. The P&A strategy can be implemented in different ways:

1. The "whole institution" disposition whereby the acquirer takes on essentially all assets and liabilities. Such a transaction typically requires a payment from the RTC to the acquirer. Initially at least, these leave few assets for the RTC's balance sheet.

2. In a "clean institution" transfer, acquirers assume depositor liabilities and primarily sound assets, and the other (low quality) assets remain on the RTC balance sheet.

3. "Branch sales" have many of the attributes of selective, clean institution" type transfers. They are in effect partial acquisitions of clean institutions, often reflecting geographical proximity.

When there is no material transfer of assets, the resolution is termed an IDT. This typically results from a lack of "acceptable" bids in offered P&A resolutions. Qualified acquirers bid a premium for the franchise according to the percentage of core deposits and other attributes of the deposit base and franchise.[18]

The IDT and P&A transactions are quite distinct. IDTs are low risk in terms of the value of the deposits and franchise and may have different *private value* to geographically dispersed acquirers. As suggested in Quadrant II of Figure 1, this suggests they will generate positive abnormal returns for the winner. In contrast, it is posited here that P&As are more likely be *common value* objects with a high variance of intrinsic value, and are likely to be

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[18] For an example of such a transaction, see *The Wall Street Journal*, Feb. 5, 1990, p. A6. "Ohio's Bank One acquires Bright Bank in Dallas: U.S. cost put at $1.4 billion." Bank One paid $45 million to acquire $2.7 billion in deposits. In reviewing these transactions, the *WSJ* noted that such arrangements could ". . . strip out most of the bad assets and leaves them with the government (RTC) for later disposal."

associated with "winners curse."[19] The IDT and P&As are structurally different transactions as characterized by Quadrants II and IV in Figure 1. Acquirers of the former will experience value gains, and of the latter, losses.

The evidence supports this hypothesis. Table 3, Panel A reports a difference in results for winners in IDT and P&A auctions. The difference in CARs over days $(-2,0)$ is 2.2%: $+1.5\%$ $(Z = 2.0)$ for the IDT packages, -0.7% $(Z = -2.8)$ for the P&A category overall. They are respectively significant positive and negative outcomes.[20]

IDTs are associated with significant gains to acquirers. If IDTs are low-variance, private value objects, then the winning bidder should experience positive abnormal returns. In such cases, the winning bid is below the full value to the winner. This is similar to divestitures, where buyers systematically experience gains.

Whole-Institution versus Branch Transfers

As indicated earlier, there are two distinct types of P&A transactions. The whole-institution P&A is a larger transaction, while a branch P&A involves more specialized assets, often based on geographical proximity and the corresponding private value attributes. The implications of this are formalized as:

Whole-institution versus branch P&As are distinct. Whole-institution acquisitions are *Common Value,* high variance purchases, with negative implications for winners. Branch P&As are *Private Value,* high variance objects, with zero or positive abnormal returns.

In Table 3, Panel B reports the results for these two subsamples of P&As. In the event window $(-2,0)$, whole firm P&As are significantly negative, while branch acquisitions are not significantly different from zero. This supports the hypothesis. Within the overall category of Common Value, high variance P&As, there is a subset (of branch P&As) that have many of the attributes of Private Value objects, but do not experience significant negative valuation consequences. The branch P&As are typically more focused acquisitions than whole-institution P&As.

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[19] They are represented by Quadrant 4 in Figure 1.

[20] The non-parametric Binomial Test was also conducted for the proportion of positive abnormal returns. Over $(-5,0)$ and $(-2,0)$ the number of positive returns to acquirers in IDT transactions were significant at the 12.5% level.

Table 3 ■ Returns to winners in insured deposit transfers (IDT) and purchase and assumption (P&A) transactions (Panel A) with a partition for whole-institution and branch P&As (Panel B).

Interval	IDT ($n = 7$)			P&A ($n = 51$)		
	CAR (%)	% Positive	Z	CAR (%)	% Positive	Z
Panel A: Returns to Winners in IDT and All PAA Transactions						
−5 to 0	2.1	86	1.9*	−0.5	47	−1.9*
−2 to 0	1.5	86	2.0**	−0.7	49	−2.8***
−1 to 0	0.4	71	0.6	−0.3	45	−1.1
−2	1.1	57	2.5**	−0.4	43	−3.3***
−1	−0.1	43	0.2	−0.5	47	−1.4
0	0.4	57	0.7	0.2	53	−0.1
+1 to +5	−2.4	0	−2.4**	−0.2	45	−0.8
−5 to +5	−0.3	43	−0.3	0.8	43	−2.0**
Panel B: Comparison of Returns to Winners in Whole-Institution and Branch P&A Transactions						
−5 to 0	−0.3	46	−1.5	−1.1	50	−1.3
−2 to 0	−0.8	51	−3.2***	−0.4	44	−0.4
−1 to 0	−0.7	43	−2.4**	0.6	50	1.7*
−2	−0.2	43	−1.9*	−1.0	44	−3.0***
−1	1.0	43	−2.9***	0.6	56	1.8*
0	0.3	54	−0.6	−0.0	50	0.6
+1 to +5	−0.6	37	−1.5	0.7	63	0.7
−5 to +5	−0.9	40	−2.2**	−0.5	50	−0.5

Mean cumulative abnormal returns (CARs), percentage of positive returns and the Z-statistic over various intervals around the announcement date.

*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

Options

A notable feature of the RTC's operations is that it can write both put and call options on some transferred assets. The exercise of a put by the acquirer will return pre-specified poor quality assets to the RTC's portfolio.[21] These

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[21] In its Statement No. 55 ("RTC Thrift Resolution Policies") the Shadow Financial Regulatory Committee (SRFC) notes that the option features of RTC transactions can result in an outcome which ". . . subjects the RTC to interim declines in value." and contributes to policies where ". . . transactions privatize only favorable outcomes." The complete text of the Statement No. 55 is found in the *Journal of Financial Research Supplement* 1992.

options mean that there is uncertainty at the time of the initial closing of a given S&L transaction regarding which assets will eventually be left on the RTC's balance sheet.

The puts and/or calls sold by the RTC have potentially considerable value to buyers. Given the variance of quality of underlying assets, the value of the options may be substantial. Such options materially reduce the risk for the acquirers.[22] This dimension is captured by column one in Figure 1. These option attributes and their associated pricing implications suggest that whole-institution P&As with options represent Common Value, low risk acquisitions. With competition, such transactions would approach the zero NPV attributes of financial market transactions. This corresponds to Quadrant I in Figure 1. Conversely, whole-institution P&As without options are characterized by Common Value, high variance attributes and lead to "winner's curse" (Quadrant IV, Figure 1).

The sample of whole-institution P&As includes 27 transactions without options and 8 with options, and the partition has substantial valuation implications. Table 4 reports consistently significant negative (at the 1% level) abnormal returns for acquirers in transactions without options.

These findings support the anticipated overbidding in the high variance *common value* scenario of whole-institution P&As without options. The anticipated zero-valuation implications of the low variance, with-options transactions were also borne out. The with-options acquirers have positive abnormal returns, but over $(-2,0)$ they are not significantly different from zero.[23]

Stock versus Mutual Targets

The first of two sets of results for subsamples where the partition is not based on characteristics of the transactions are presented next. These two analyses consider the impact of stock versus mutual form of the pre-RTC organization (of the acquired S&L), and regional variations.

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[22] The nature of options in RTC transactions is somewhat variable. Clearly they play no role in IDTs, and a potentially significant role in P&As. In some transactions, the same bidder submitted both with-options and without-options bids for evaluation by the RTC.

[23] The non-parametric Binomial test indicated that the with-options acquirers had significant positive returns at the 7% level for the interval $(-2,0)$ and day 0.

Table 4 ■ Returns to winners in whole-institution P&A transactions with and without options.

Interval	P&A with Option (n = 8)			P&A w/o Option (n = 27)		
	CAR (%)	% Positive	Z	CAR (%)	% Positive	Z
−5 to 0	0.3	50	0.1	−0.4	44	−1.7*
−2 to 0	1.2	88	1.3	−1.5	41	−4.2***
−1 to 0	0.1	63	0.1	−0.9	37	−2.9***
−2	1.1	63	2.1***	−0.6	37	−3.3***
−1	−1.0	50	−1.5	−0.9	41	−2.5***
0	1.1	88	1.7*	0.0	44	−1.6
+1 to +5	−1.5	25	−1.5	−0.4	41	−0.9
−5 to +5	−1.2	50	−0.9	−0.8	37	−1.8*

Mean cumulative abnormal returns (CARs), percentage of positive returns and the Z-statistic over various intervals around the announcement date. The CRSP value-weighted index was used as a proxy for the market.

　*Significant at the 10% level.
　**Significant at the 5% level.
***Significant at the 1% level.

Issues associated with stock versus mutual form of thrift organization have been examined in papers such as Masulis (1987) which analyzed the conversion process and performance differences. Cordell, MacDonald and Wohar (1993) provide evidence of different investment and risk taking behavior by mutual and stock S&Ls.

To investigate whether pre-RTC form of organization was reflected in acquirer outcomes, the CARs for subsets were compared based on this attribute of the assets acquired. Table 5 reports results when the winners are partitioned according to the pre-RTC ownership organization (stock or mutual) of the target S&L and reports outcomes for 56 acquirers, since the form of organization could not be determined for two S&Ls. They acquired the assets of 40 formerly mutual, and 16 formerly stock, institutions.

The (−2,0) event window shows significant losses to acquirers of mutual-organization S&Ls, with a CAR of −0.9% and a test statistic of −2.9. In contrast, there is a CAR of +1.1% over (−2,0) for acquirers of previously stock S&L assets, yet the gain is not significant (Z = 1.5). There is a marked difference between the two subsets.

Table 5 ■ Returns to winners broken down by the type of organization of the S&L.

Interval	Stock S&L (n = 16)			Mutual S&L (n = 49)		
	CAR (%)	% Positive	Z	CAR (%)	% Positive	Z
−5 to 0	2.3	69	1.9*	−0.8	48	−2.1**
−2 to 0	1.1	63	1.5	−0.9	53	−2.9***
−1 to 0	−0.1	50	−0.2	−0.1	50	−0.6
−2	1.3	69	2.9***	−0.8	35	−4.2***
−1	−0.3	38	−0.6	−0.4	53	−0.9
0	0.2	50	0.4	0.3	55	0.0
+1 to +5	−1.5	31	−1.7*	−0.3	43	−1.0
−5 to +5	0.7	50	0.3	−1.1	40	−2.2**

Mean cumulative abnormal returns (CARs), percentage of positive returns and the Z-statistic over various intervals around the announcement date. The CRSP value-weighted index was used as a proxy for the market.

   *Significant at the 10% level.
  **Significant at the 5% level.
***Significant at the 1% level.

Regional Variations

The final partition of acquirers addresses the substantial variation in the regional attributes of the RTC's operations. The RTC classifies transactions into one of four geographic regions: East, Central, Southwest and West. The early transactions were disproportionately in the West. To examine whether the regional attributes of the properties had any implications on bidder returns, the abnormal returns findings were examined for acquirers of properties in each of the four regions.

Table 6 shows considerable regional variation in results. There are no abnormal returns for the Central and Southwest regions, while the results for the 11 transactions in the West are significantly negative. Over days (−2,0) the CAR is −2.5%, significant at the 1% level. A significant negative CAR of −1.8% (Z = −2.8) is also observed over (−1,0). In contrast, over (−1,0) winners in the East had positive abnormal returns of 0.9% (Z = 2.1).

There have been debates regarding the efficacy of various RTC offices and functional divisions.[24] These results indicate that the Western office was able

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[24] See, for example, *The Wall Street Journal*, "RTC Legal staff faces Senate Probe on hiring practices," August 12, 1992.

Table 6 ■ Comparison of winners by RTC regions.

Interval	East (n = 25)	Central (n = 17)	Southwest (n = 5)	West (n = 11)
−5 to 0	0.8 (56) 0.4	−0.3 (47) −0.4	−1.1 (60) −0.6	−1.8 (45) −2.5**
−2 to 0	0.5 (64) 0.5	−0.6 (53) −1.0	−0.0 (60) 0.4	−2.5 (27) −4.1***
−1 to 0	0.9 (56) 2.1**	−0.7 (53) −1.6	−0.6 (40) −0.3	−1.8 (27) −2.8***
−2	−0.4 (44) −2.1**	0.1 (47) 0.5	0.5 (80) 1.1	−0.7 (27) −3.2***
−1	−0.3 (48) 0.4	−0.3 (53) −1.3	0.2 (80) 0.7	−1.2 (18) −2.3**
0	1.2 (68) 2.6**	−0.4 (59) −0.9	−0.8 (40) −1.2	−0.6 (18) −1.6
+1 to +5	−1.3 (36) −2.3**	−0.8 (41) −0.9	−0.0 (40) −0.3	1.5 (45) 1.1
−5 to +5	−0.5 (36) −1.2	−1.1 (47) −0.9	−1.1 (40) −0.6	−0.3 (55) −1.2

Mean cumulative abnormal returns (CARs), percentage of positive returns (given in parentheses) and the Z-statistic (given below the cumulative abnormal return) over various intervals around the announcement date.

*Significant at the 10% level.
**Significant at the 5% level.
***Significant at the 1% level.

to extract systematically higher offers from bidders. This outcome is not explained by differences in the number of bidders, where regional averages were as follows: West 2.7, Southwest 2.0, Central 6.1 and East 4.7.

Conclusion

This article provides a review of the institutional background of the RTC and considers the market characteristics of RTC asset and operations sales from an auction perspective. The RTC has been a major financial institution, and there have been claims that it has sold some S&L assets at "fire sale" prices. However, the findings indicate that the RTC auction system appears to have performed quite well given the policy goals of "least cost" resolutions.

The findings do not support the hypothesis that transactions are systematically favorable to acquirers, and most subsets of winning bidders have predominantly negative valuation outcomes. In particular, acquirers of

whole-institution P&As, formerly mutual institutions and properties in the Western region experience persistently negative abnormal returns. These findings are consistent with those of general whole-firm acquirers in recent times, and in contrast to most of the previous studies of acquirers of distressed financial institutions cited in the literature review.

The RTC's pricing of the options it writes has an impact on the valuation outcomes for acquirers. Bidders who do not receive options experience losses. Those who do receive options experience some gains from the perspective of the equity markets, but they are not significantly different from zero. When the patterns of abnormal returns are related to attributes of the acquired properties it transpires that the auction motivated insights are generally reflected in pricing outcomes.

In summary, there is little evidence of underpricing or positive abnormal returns for the sample of publicly traded acquirers examined. To the contrary, several subsets of transactions were found where acquirers experienced negative abnormal returns. The only subsample with significant positive returns to winning bidders is with IDT transactions. Auction theory predicts that such low variance, private value transactions can be expected to result in acquirer gains.

The policy implications of the issues associated with the RTC are substantial. The problems which led to its creation, and their aftermath, have had such a profound effect that the U.S. Treasury and the regulators of both S&Ls and commercial banks proposed on July 28, 1995 to abolish the S&L industry. While the RTC became controversial for many reasons, the analysis finds that it was not systematically transferring assets and operations at "fire sale" prices. Given the scale of its activities, some examples of mispricing might be expected, but the findings here are consistent with the notion that they were limited subsets of transactions rather than profiles of typical outcomes.

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Appendix

Methodology

For each security *j*, the market model is used to calculate an abnormal return (*AR*) for event day *t* as follows:

$$AR_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt}) \tag{1}$$

where R_{jt} is the rate of return security *j* for event day *t*, and R_{mt} is the rate of return on the CRSP value-weighted index on event day *t*. The coefficients α_j and β_j are the ordinary least squares estimates of the intercept and slope, respectively, of the market model regression, which is run over an estimation period from $t = -200$ to $t = -51$, relative to the initial event date $t = 0$.

The cumulative abnormal return (*CAR*) from day T_{1j} to day T_{2j} is defined as:

$$CAR_j = \sum_{t=T_{1j}}^{T_{2j}} AR_j \tag{2}$$

Various intervals are cumulated around the announcement date. For a sample of N securities, the mean CAR is defined as:

$$\overline{CAR} = \sum_{j=1}^{N} CAR_j/N \tag{3}$$

The expected value of CAR is zero in the absence of abnormal performance.

The test statistic described by Dodd and Warner (1983) is the mean standardized cumulative abnormal return. To compute this statistic, the abnormal return AR_{jt} is standardized by its estimated standard deviation s_{jt},[25] *i.e.,*

$$SAR_{jt} = AR_{jt}/S_{jt} \tag{4}$$

The standardized cumulative abnormal return $SCAR_j$ over the interval $t = T_{1j}, \ldots, T_{2j}$ is:

$$\overline{SCAR_j} = \sum_{t=T_{1j}}^{T_{2j}} SAR_{jt}/\sqrt{(T_{2j} - T_{1j} + 1)} \tag{5}$$

The test statistic for a sample of N securities is

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[25] The value of S_{jt}^2 is:

$$S_{jt}^2 = S_j^2 \left(1 + \frac{1}{D_j} + (R_{mt} - \overline{R}_m)^2 \Big/ \sum_{\tau=1}^{D_j} (R_m - \overline{R}_m)^2\right)$$

where
S_j^2 = residual variance for security j from the market model regression
D_j = number of observations during the estimation period
R_{mt} = rate of return on the market index for date t of the event period
R_m = mean rate of return on the market index during the estimation period
$R_{m\tau}$ = rate of return on the market of day τ of the estimation period

$$Z = \sum_{j=1}^{N} \overline{SCAR_j} / \sqrt{N} \tag{6}$$

Each SAR_{jt} is assumed to be distributed unit normal in the absence of abnormal performance. Under this assumption, Z is also unit normal.