Implicit Liquidity Premiums in the Disposition of RTC Assets

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Abstract. **The Resolution Trust Corporation (RTC) was created by congressional legislation passed in 1989, and was charged with, among other things, the orderly disposition of other real estate owned (OREO) property. Questions have been raised about how efficient and effective the RTC has been in achieving its congressional mandate. One of the issues resulting from the efficiency question involves the amount of discount the RTC realizes for a quick disposition of the property. This study utilizes data provided by the RTC concerning its sales to analyze the implicit liquidity premium resulting from disposing of OREO. The results of the study indicate what variables contribute to liquidity premiums. This paper's importance relies most heavily on the finding that realistic market adjustments in regulation, over time, helped to achieve a higher degree of liquidity for RTC real estate property sales. The findings of this paper confirm the legislative intent of FIRREA, which is to ensure that real estate properties acquired by the government are disposed of at the highest dollar value possible.**

Introduction

In passing the Financial Institutions Reform, Recovery and Enforcement Act of 1989 (FIRREA), Congress created the Resolution Trust Corporation (RTC) (Financial Institutions Reform . . . , 1989). The RTC is responsible, among other things, for the orderly disposition of other real estate owned (OREO) property, i.e., property that has been foreclosed by a failed thrift institution. One of the objectives of the RTC relative to property disposition, as established by the legislation, is to get top dollar for the real estate sales. Another objective is to minimize the impact of its sales on local markets, while a third objective is to make available affordable housing for low- and moderate-income individuals. Although not stated anywhere in the legislation, it is implied that all disposition of assets should be accomplished by the end of the seven-year life of the corporation, which will most likely make the first two objectives very difficult to attain.

Directions of the RTC by Congress for accomplishing these objectives are quite vague, although very specific operating procedures were established, especially as relates to "distressed areas." Six states were identified by FIRREA as distressed areas: Texas, New Mexico, Oklahoma, Louisiana, Colorado, and Arkansas (Financial Institutions Reform . . . , 1989). It was anticipated that most of the RTC's real estate

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holdings would be in these areas, and one of the initial mandates was that the RTC must sell properties in these areas for at least 95% of the estimated market value.

Provisions were made for changing that rule, and changes were subsequently made, in May 1990 and then again in March 1991, in both the appraisal procedure and the allowable percentage of price to market value. Regulations as of March 1991 allow sales of properties in distressed areas for at least 80% of the estimated market value if sold within six months; 60% of estimated value if sold during the next twelve months; and at least 50% of appraised value if sold within the next six months. The regulatory changes also dictate that an appraisal is now valid for two years, where properties with a value of less than $50,000 do not fall under the regulatory guidelines.[1]

With these changes has come greatly increased sales activity of RTC properties. Yet questions have continued to be raised about how efficient and effective the RTC has been in achieving its congressional mandate. One of the issues resulting from the efficiency question involves the amount of discount that the RTC realizes for a quick disposition of the property. This study utilizes data provided by the RTC concerning its sales to analyze the implicit liquidity premium resulting from disposing of these assets. Liquidity premium in this sense is measured by comparing the actual sales price of properties with their corresponding most recent appraised value, relative to the regulations in existence at the time of sale. Following a review of relevant literature in this area, a discussion of the data and methodology will be presented. The paper then discusses the findings, and concludes with a summary of the research.

Distressed Sales

All of the property owned by the RTC has come from defaulted loans owned by either failed financial institutions or the RTC. As such, these properties fall under the description of distressed sales, inasmuch as the failed lenders and/or the RTC must manage and dispose of these properties under market conditions that are often less than ideal, while still meeting their congressional mandates. And while the definition of market value that FIRREA provided the RTC includes the standard market value concepts, i.e., all conditions requisite to a fair sale are present, price is not affected by any undue stimulus, and buyer and seller are both acting knowledgeably and prudently, the reality is that these assumptions are not met. From that perspective, the appraised value is undoubtedly biased, typically overvaluing property that is placed on the market through a traditional seller/broker relationship, and undervaluing property that is disposed through an auction process.

The reason for this revolves around the element of "consummation of a sale as of a specified date," which may be ignored in the maket-based appraisal process. As Shilling et al. (1990) report, lenders may not want "fire sale" or "liquidation value" appraisals, but they often do require a value based on a fairly short marketing time interval. In that case, the appraisal process must incorporate the discount resulting from such a short sale period. Using a framework for adjusting distressed real estate properties to incorporate liquidating discounts, Shilling et al. used a Poisson process to determine the probability of receiving an offer on a property in any particular period of time. From this, empirical estimates were arrived at that indicate a discount of 24% of market value is appropriate for selling distressed real estate. This dis-

counting process is not explicitly recognized in the definition of market value that the RTC uses in determining appraised value (Sullivan, 1990).

But when properties sell for less than they are appraised, charges of dumping are often made. Dumping supposedly occurs when property sells for a price lower than desired, or lower than a previous transaction price, or lower than a price that might be attained in the future. However, as Goodman (1991) points out, these sales might simply be reflecting a softening market, and the sales are the evidence, but not the cause, of a depressed local market.

Proponents of the dumping theory argue that disposing of property in a market that is already soft will contribute to a downward spiral in values, thus increasing the extent and degree of distress in that market. Crockett (1990) counters this argument by pointing out that one purpose of property sales is to reflect an unbiased assessment of the information available to market participants. Therefore, sales of distressed property would not only convey price information, but the occurrence of transactions would aid market participants in assessing conditions. And while distressed sales in soft markets are likely to entail the realization of losses that had in fact occurred earlier, "the reorganization of asset holdings will preserve or increase values relative to those that would prevail under continued inefficient holding" (Crockett, 1990).

In a study that has analyzed recovery rates of distressed properties as well as strategies by which real estate should be managed and sold by government agencies, Curry et al. (1991) used data from a sample of commercial Federal Savings and Loan Insurance Corporation (FSLIC) receivership real estate assets sold in 1988. They found that the average recovery rate was 64% of the net takeover value,[2] where the recovery rate is net of asset management, disposition and financing costs. Relating recovery rates to asset management entities and a vector of property-specific control variables in a regression framework, Curry et al. found that private contractors were less efficient in the management of distressed assets than either the public (FSLIC) or quasi-public (Federal Asset Disposition Association) entities.

Research that developed a model to determine the optimal asset sales strategy for the RTC was recently reported by Lea and Thygerson (1991). That model characterizes the asset disposition decision process of the RTC for different types of assets. Seeking to maximize the expected net present value of the assets acquired by the RTC, the model indicated that liquid assets and retail deposit franchises should be sold as quickly as possible. Further, the model indicated that illiquid assets that are performing and do not have high servicing costs should be sold with seller financing by the RTC, or financed through senior/subordinated securities. Finally, illiquid nonperforming assets are good candidates for equity participation financing by the RTC, where the RTC should refain from selling assets with puts.

In light of the congressional mandate establishing the RTC, it is clear that distressed properties held by the RTC cannot be taken off the market until conditions improve. And it is also clear that what properties were valued at when they were foreclosed (i.e., what their book value was, as determined by the RTC at acquisition) is irrelevant to what they can and should be sold for in the current market. If a market is soft, then the RTC appraised value should reflect this, although it is not clear that the appraisals incorporate the concept of a "quick sale," and its corresponding discount. As the Curry et al. (1991) study indicates, sales of government-owned distressed property will often result in a loss from initial value (in their study,

Exhibit 1
RTC Sales by Year

Year	Sale Price Mean	Appraised Value Mean	Price/Value Ratio	Number of Sales	$ Amount by Year	% By Year
1989	$276,907	$333,018	83.2	181	$50,120,107	.9
1990	143,420	157,657	91.0	6,227	893,079,080	15.2
1991	119,748	150,183	79.7	29,906	3,581,197,744	60.9
1992	181,644	246,016	73.8	7,471	1,357,064,266	23.1
Total	$134,326	$168,353	79.8	43,785	$5,881,461,197	100.0

Source: derived by Authors from data provided by the RTC

defined as net takeover value), and this loss can be minimized by the type of management entity utilized as well as the timing of the sale.

The question is how much loss is actually occurring and what factors contribute most to that loss? This study provides the measurement of the extent of the discount from appraised value accepted by the RTC, to which we now turn our attention.

RTC Property Sales Data

The data used in this study was obtained from the RTC and contains 58,600 sales of distressed properties throughout the United States and Puerto Rico. The sales occurred from the RTC's inception in August 1989 and run through June 1992. The number of sales by year, reflecting mean appraised value and sales price as well as total volume of sale, is provided in Exhibit 1. As can be seen from this data, very few sales are recorded in 1989, with most of the sales occurring in 1991. The reason for this is undoubtedly the change in regulations which allow the RTC to take a lower loan/value ratio deal, thus providing discount incentives to the market participants. The 1991 level of sales activity is expected to continue in 1992 and beyond.

Exhibit 2 provides a listing of the sales by state. The mean sale price for all properties is $134,326, while the mean appraised value is $168,353.[3] The ratio of sale price to appraised value is thus calculated to be 79.8%. The total number of sales reported in Exhibit 2 is 43,785, which is obviously significantly less than the 58,600 sales records provided by the RTC. The difference is due to missing values in one or more of the key variables used in this analysis, where all data with missing values, except for *ZIP* and the variable for property condition, was deleted. In addition, the data was screened for obvious outliers that further reduced the number of usable observations. It is clear that most of the sales have occurred in the states that were previously identified by the FIRREA as distressed.

The number of sales in the top six states are listed in Exhibit 3, where 74.4% of all sales were in these states. When the dollar volume of sales is considered, the composition of the top six states changes slightly, with Oklahoma falling out and California making the list. Keep in mind that the six distressed states identified by

Exhibit 2
Sales by State*

State	Sale Price Mean	Appraised Value Mean	Price/Value Ratio %	Number of Sales	Rank by No.	Total Sale Amount	Rank by $
AK	$175,129	$193,617	90.5	52	38	$9,106,696	35
AL	119,810	155,968	76.8	371	18	44,449,506	17
AR	135,557	170,390	79.6	252	24	34,160,377	22
AZ	152,653	204,603	74.6	3,170	3	483,910,327	4
CA	646,298	717,535	90.1	781	10	504,758,769	3
CO	122,915	154,961	79.3	2,406	5	295,732,311	5
CT	169,823	197,771	85.9	85	32	14,434,947	32
DC	172,400	220,000	78.4	2	51	344,800	49
DE	228,779	260,875	87.7	8	47	1,830,232	42
FL	178,906	233,276	76.7	4,202	2	751,762,844	2
GA	114,467	139,972	81.8	1,261	7	144,343,316	7
HI	62,352	59,089	105.5	3	50	187,056	51
IA	121,954	145,633	83.7	140	29	17,073,538	30
ID	37,809	44,994	84.0	28	44	1,058,654	46
IL	133,660	161,809	82.6	555	13	74,181,078	11
IN	394,499	421,062	93.7	47	42	18,541,444	29
KS	69,180	85,706	80.7	435	16	30,093,417	23
KY	35,658	43,721	81.6	51	39	1,818,560	43
LA	54,582	68,887	79.2	2,731	4	149,062,104	6
MA	135,924	172,889	78.6	329	21	44,719,039	16
MD	320,450	397,669	80.6	69	35	22,111,020	28
ME	26,995	46,866	57.6	49	41	1,322,755	45
MI	114,482	113,792	100.6	63	36	7,212,384	37
MN	161,961	189,304	85.6	351	19	56,848,185	14
MO	261,317	323,246	80.8	159	27	41,549,328	20
MS	90,111	120,655	74.7	302	22	27,213,628	25
MT	31,250	33,917	92.1	6	49	187,500	50
NC	89,172	106,595	83.7	921	8	82,127,384	9
ND	50,712	59,573	85.1	86	31	4,361,269	40
NE	73,896	82,144	90.0	163	26	12,045,108	34
NH	75,752	95,238	79.5	78	33	5,908,637	38
NJ	143,647	164,451	87.3	563	11	80,873,306	10
NM	65,076	81,348	80.0	903	9	58,763,745	13
NV	100,513	119,763	83.9	158	28	15,881,059	31
NY	187,359	269,188	69.6	126	30	23,607,172	27
OH	75,119	90,214	83.3	556	12	41,765,892	19
OK	73,087	89,758	81.4	1,891	6	138,208,273	8
OR	108,968	114,918	94.8	221	25	24,081,895	26
PA	95,396	116,018	82.2	444	15	42,355,877	18
PR	242,368	207,194	117.0	37	43	8,967,600	36
RI	99,536	121,429	82.0	14	46	1,393,500	44
SC	158,450	188,564	84.0	255	23	40,404,676	21
SD	75,888	80,417	94.4	6	48	455,325	47
TN	121,536	154,816	78.5	507	14	61,618,595	12
TX	131,116	166,135	78.9	18,006	1	2,360,867,133	1
UT	87,566	116,106	75.4	329	20	28,809,092	24
VA	115,106	152,048	75.7	415	17	47,769,011	15
VT	N/A	N/A	N/A	N/A	N/A	N/A	N/A
WA	185,547	210,299	88.2	74	34	13,730,512	33
WI	113,745	125,559	90.6	49	40	5,573,484	39
WV	22,776	25,000	91.1	17	45	387,200	48
WY	60,203	70,264	85.7	58	37	3,491,760	41
Total	$134,326	$168,353	79.8	43,785		$5,881,461,197	

*States plus District of Columbia (DC) and Puerto Rico (PR)
Source: derived by Authors from data provided by the RTC

Exhibit 3
Top Six States by Number of Sales

State	Number of Sales	Percentage by State %
Texas	18,006	41.1
Florida	4,202	9.6
Arizona	3,170	7.2
Louisiana	2,731	6.2
Colorado	2,406	5.5
Oklahoma	1,891	4.3
Sub-Total	32,406	74.4
All Other States	11,379	26.0
Total	43,785	100.0

Top Six States by Value of Sales

State	Dollar Value of Sales	Percentage by State %
Texas	$2,360,867,133	40.1
Florida	751,762,844	12.8
California	504,758,769	8.6
Arizona	483,910,327	8.2
Colorado	295,732,311	5.0
Louisiana	149,062,104	2.5
Sub-Total	$4,546,093,488	77.3
All Other States	1,335,367,709	22.7
Total	$5,881,461,197	100.0

Source: derived by Authors from data provided by the RTC

FIRREA were Texas, New Mexico, Oklahoma, Louisiana, Colorado and Arkansas, so all of these distressed states are represented in either the number or dollar volume of sales, with the exception of New Mexico and Arkansas. The top six states in dollar volume of sales accounted for 77.3% of all sales over the time period studied.

The number of sales by property are listed in Exhibit 4, with the key to the codes provided in Exhibit 5. As can be seen from this table, the greatest amount of the sales in terms of number of properties sold has been type code 101, single-family residences. The greatest amount of sales in terms of dollar volume has been type code 318, apartments. The top six types of property sales are provided in Exhibit 6, both for number and dollar value of sales. While the top six types account for 84.3% of all sales, only 66.1% of the total dollar value of sales is represented by the top six types. Not surprisingly, when dollar value is considered, four types of investment properties, including retail, office complex, hotel/motel, and unimproved commercial land, fall in behind single-family residences.

Since the largest number of sales have occurred in single-family residences, Exhibit

Exhibit 4
RTC Sales by Type Code

Type Code	Sale Price Mean	Appraised Value Mean	Price/Value Ratio	Number of Sales	Rank by No.	Total Sale Amount	Rank by $
101	$65,112	$74,764	87.1	16,139	1	$1,050,838,210	2
102	41,583	49,583	83.9	2,872	4	119,427,467	12
103	33,684	45,503	74.0	171	19	5,759,998	30
104	52,275	65,080	80.3	620	10	32,410,475	20
105	53,285	64,394	82.7	1,751	6	93,302,508	15
106	42,027	52,361	80.3	7,291	2	306,416,378	7
107	38,492	47,761	80.6	63	26	2,424,982	36
108	19,148	24,417	78.4	128	22	2,450,958	35
109	425,716	483,684	88.0	176	18	74,926,051	16
110	16,381	22,046	74.3	231	16	3,783,949	33
111	13,584	19,428	69.9	28	28	380,350	40
112	9,300	15,887	58.5	14	38	130,200	43
113	9,963	12,446	80.0	25	29	249,071	42
201	470,305	605,977	77.6	735	9	345,674,219	5
202	77,308	105,062	73.6	2,787	5	215,458,288	9
203	47,779	69,317	68.9	6,085	3	290,734,363	8
204	273,662	387,088	70.7	235	15	64,310,673	17
205	262,596	341,620	76.9	98	24	25,734,453	22
206	428,070	507,609	84.3	118	23	50,512,307	19
207	12,583	14,112	89.2	3	43	37,750	44
208	300,000	365,000	82.2	1	44	300,000	41
301	244,551	356,107	68.7	51	27	12,472,124	27
302	691,632	905,287	76.4	1,038	7	717,914,213	3
303	698,925	924,905	75.6	504	11	352,258,271	4
304	208,212	305,594	68.1	21	32	3,472,453	32
305	738,575	847,083	87.2	149	21	110,047,602	13
306	334,408	457,093	73.2	285	14	95,306,226	14
307	199,208	236,181	84.3	80	25	15,936,606	26
308	1,705,319	2,038,646	83.6	180	17	306,957,353	6
309	191,323	251,931	75.9	11	39	2,104,552	37
310	239,481	275,469	86.9	15	35	3,592,220	34
311	554,741	827,233	67.1	15	37	8321,122	28
312	3,176,149	3,822,895	83.1	20	33	63,522,978	18
313	2,061,545	2,825,913	73.0	11	40	22,676,995	23
314	1,123,906	1,181,842	95.1	25	30	28,097,648	21
315	56,775	69,938	81.2	8	41	454,200	39
316	319,117	426,250	74.9	6	42	1,914,700	38
317	321,547	425,949	75.5	376	12	120,901,499	11
318	1,284,192	1,616,219	79.5	869	8	1,115,962,944	1
319	109,458	147,465	74.2	152	20	16,637,642	25
401	357,297	464,286	77.0	16	34	5,716,750	31
402	438,867	815,700	53.8	15	36	6,583,005	29
403	907,429	970,037	93.5	23	31	20,870,862	24
550	457,537	512,223	89.3	344	13	157,392,838	10
Total	$134,326	$168,353	79.8	43,785		$5,881,461,197	

Source: derived by Authors from data provided by the RTC

7 provides a breakdown of these sales by state. Texas has the distinction, as expected, of having the largest number of properties, at the highest dollar value, of distressed sales. In fact, the sales in Texas comprise over 38% of the total dollar value of single-family residence sales.

Exhibit 5
RTC Property Type Code Key

Residential

101 Single-Family Residence
102 Duplex
103 Triplex
104 Quadruplex
105 Townhouse
106 Condominium
107 Single Family—CoOP
108 Single-Family—Timeshare
109 Master Record for Marketing 5+Units
110 Mobile Home w/Land—Permanent
111 Mobile Home w/Land—Mobile
112 Mobile Home w/o Land—Permanent
113 Mobile Home w/o Land—Mobile

Land

201 Unimproved Commercial
202 Unimproved Residential
203 Residential Developed
204 Commercial Developed
205 Agricultural
206 Ranch/Pasture
207 Oil & Gas
208 Other Mining

Commercial

301 Mobile Home Park
302 Office Complex
303 Retail
304 Time Share Vacation/Resort
305 Storage Facility/Mini-Warehouse
306 Industrial Park/Warehouse
307 Restaurant
308 Hotel/Motel
309 Marina/Boatyard
310 Parking Garage/Lot
311 Medical Facility/Private Hospital
312 Nursing/Retirement Home
313 Resort/Golf Course
314 Recreation/Athletic Club
315 Church
316 School
317 Other
318 Apartments
319 Office Condo
550 Branch Bank

Mixed

401 Mixed–Predominately Office
402 Mixed-Predominately Retail
403 Mixed-Predominately Residential

Source: RTC

One charge against the RTC in its marketing of distressed properties has been that it has allowed "cherry picking" to occur. Cherry picking refers to the best properties, either in terms of condition or upside potential, being sold quickly but without necessarily bringing top dollar. While no data exist as to the upside potential of the marketed properties, the condition at time of sale is known, and is presented in Exhibit 8. It is clear that those properties rated by the RTC as being in excellent condition, 5.9% of the total properties sold for which complete data exists, did sell for the highest price to value ratio, at 81.1%. While the results do not support the cherry picking theory, there is some evidence that the market is willing to pay a marginal premium for property in excellent condition. This in itself might provide policy guidance to the RTC in that it should consider underaking renovation or improvements to bring properties that are not selling into this category, thus potentially recognizing a higher price (and in some cases a sale where it would not have been possible without the upgrade).

Exhibit 6
Highest Number of Sales by Type

Type of Property	Number of Sales	Percentage by Type
Single-Family Residence	16,139	36.9
Condominium	7,291	16.7
Residential Developed Land	6,085	13.9
Duplex	2,872	6.6
Residential Unimproved Land	2,787	6.4
Townhouse	1,751	4.0
Sub-Total	36,925	84.3
All Other Types	6,860	15.7
Total	43,785	100.0

Highest Dollar Value of Sales by Type

Type of Property	Dollar Value of Sales	Percentage by Type
Apartments	$1,115,962,944	19.0
Single-Family Residence	1,050,838,210	17.9
Office Complex	717,914,213	12.2
Retail	352,258,271	6.0
Unimproved Commercial Land	345,674,219	5.9
Hotel/Motel	306,957,353	5.2
Sub-Total	$3,889,605,210	66.1
All Other Types	1,991,855,987	33.9
Total	$5,881,461,197	100.0

Source: derived by Authors from data provided by the RTC

Methodology

The data characteristics are provided in Exhibit 9, which includes the observation number for each variable as well as the mean and standard deviation. The list of variables include the original data, as well as several variables that were created to facilitate analysis. The explanation of those variables that are not self-explanatory follows. The Property Condition (CN) number is coded 4 if the property was in excellent condition, 3 for good condition, 2 for fair condition, and 1 for poor condition.

The *DDATE* variables are regulation dummy variables, where *DDATE*1 is a sale between August 1989 and May 1990; *DDATE*2 is a sale between June 1990 and March 1991; and *DDATE*3 is a sale between April 1991 and February 1992. These variables define appraisal regulation periods, where *DDATE*1 sales required a sales price greater than or equal to 95% of the appraised value; *DDATE*2 sales required a sales price greater than or equal to 95% of appraised value within the first six months, 80% of appraised value for a sale between months six and nine, and 75% of appraised value for a sale after nine months; *DDATE*3 sales required a sales price greater than or equal to 80% of appraised valued for a sale within the first six

Exhibit 7
RTC Single-Family Detached Sales by State*

State	Sale Price Mean	Appraised Value Mean	Price/Value Ratio %	Number of Sales	Rank by No.	Total Sale Amount	Rank by $
AK	$74,244	$74,926	99.1	27	36	$2,004,579	31
AL	42,325	51,295	82.5	129	16	5,459,866	23
AR	39,652	42,661	92.9	122	19	4,837,509	28
AZ	96,942	108,012	89.8	939	4	91,028,923	3
CA	261,526	288,970	90.5	348	8	91,011,132	4
CO	70,778	80,073	88.4	583	7	41,263,708	6
CT	198,529	223,735	88.7	34	34	6,750,000	18
DC	0	0	N/A	0	51	0	51
DE	301,650	306,500	98.4	2	48	603,300	45
FL	84,700	95,309	88.9	1,231	2	104,265,786	2
GA	102,988	123,422	83.4	597	6	61,484,129	5
HI	12,211	15,259	93.1	1	49	14,211	49
IA	17,502	19,859	88.1	69	27	1,207,672	38
ID	49,530	51,847	95.5	15	42	742,946	41
IL	22,055	26,206	84.2	333	9	7,344,328	16
IN	27,370	31,359	87.3	22	39	602,140	46
KS	36,978	45,411	81.4	239	11	8,837,730	14
KY	33,182	40,544	81.8	41	31	1,360,460	37
LA	36,660	44,049	83.2	857	5	31,417,209	8
MA	164,523	200,624	82.0	93	22	15,300,685	11
MD	80,313	94,533	85.0	15	43	1,204,700	39
ME	83,200	130,000	64.0	8	45	665,600	43
MI	35,368	39,281	90.0	39	33	1,379,339	35
MN	70,809	79,100	89.5	104	21	7,364,103	15
MO	37,298	42,608	87.5	84	24	3,133,049	29
MS	42,193	51,651	81.7	125	18	5,274,081	26
MT	31,250	33,917	92.1	6	47	187,500	48
NC	78,734	96,875	81.3	76	26	5,983,752	20
ND	30,223	32,928	91.8	47	29	1,420,498	34
NE	22,604	27,173	83.2	61	28	1,378,866	36
NH	109,037	123,863	88.0	24	38	2,616,894	30
NJ	195,514	214,850	91.0	111	20	21,702,101	9
NM	45,523	54,198	84.0	250	10	11,380,858	13
NV	134,662	148,955	90.4	42	30	5,655,822	21
NY	166,297	214,474	77.5	39	32	6,485,585	19
OH	35,720	42,585	83.9	152	13	5,429,451	25
OK	35,379	40,276	87.8	1,009	3	35,697,532	7
OR	41,285	44,234	93.3	135	15	5,573,430	22
PA	33,551	39,995	83.9	209	12	7,012,199	17
PR	68,345	69,809	97.9	22	40	1,503,600	32
RI	103,286	114,429	90.3	7	46	723,000	42
SC	54,616	65,751	83.1	90	23	4,915,469	27
SD	0	0	N/A	0	50	0	50
TN	103,037	118,113	87.2	128	17	13,188,695	12
TX	54,510	63,067	86.4	7,358	1	401,087,891	1
UT	66,242	73,945	89.6	82	25	5,431,879	24
VA	102,321	116,954	87.5	151	14	15,450,457	10
VT	0	0	N/A	0	51	0	51
WA	54,494	56,944	95.7	27	37	1,471,350	33
WI	35,492	39,959	88.8	17	41	603,359	44
WV	30,720	32,250	95.3	10	44	307,200	47
WY	37,023	42,379	87.4	29	35	1,073,655	40
Totals	$65,112	$74,764	87.1	16,139		$1,050,838,210	

*States plus District of Columbia (DC) and Puerto Rico (PR)
Source: derived by Authors from data provided by the RTC

Exhibit 8
RTC Sales by Condition

Property Condition	Sale Price Mean	Appraised Value Mean	Price/Value Ratio %	Number of Sales	Dollar Amount of Sales	% by Cond.
Excellent	$354,544	$437,328	81.1	987	$349,934,819	5.9
Good	147,457	184,919	79.7	19,998	2,948,853,085	50.1
Fair	106,185	132,694	80.0	15,168	1,610,616,355	27.4
Poor	59,510	75,321	79.0	2,648	157,581,527	2.7
Missing	163,418	206,572	79.1	4,984	814,475,446	13.8
Total	$134,326	$168,353	79.8	43,785	$5,881,461,197	100.0

Source: derived by Authors from data provided by the RTC

Exhibit 9
RTC Data Characteristics

Variable	N	Mean	Std. Dev.
Sale Price (*SP*)	43,785	134,325.94	723,993.0
Log of Sale Price (*LSP*)	43,785	10.34550	1.4796887
Appraised Value (*VA*)	43,785	168,353.4	892412.17
Square Footage (*SQ*)	33,061	55,265.1	5,356,601.62
Acreage (*AC*)	43,785	36.1461651	1,425.52
Sale Date Year (*SDY*)	43,785	1991.02	0.05735712
Appraised Date Year (*VDY*)	43,785	1990.14	0.7028349
Months Between *SP* and *VA* (*NM*)	43,785	11.0750029	7.0393326
Property Condition (*CN*)	39,367	2.4938146	0.6600849
Log of Property Condition (*LCN*)	39,367	0.8709059	0.3116655
Sale Price to Appraised Value Ratio (*SPAV*)	43,785	0.8313286	0.3388391
VA Minus *SP* (*DIF*)	43,785	34,027.46	334,437.02
Mortgage Interest Rate (*RATE*)	43,785	0.0928325	0.0047984
Log of Mortgage Interest Rate (*LRATE*)	43,785	2.2271845	0.0517568
RTC Financing Available (*RTCFIN*)	43,785	0.6258933	0.4838954
Regulation Dummy (*DDATE*1)	43,785	0.0217421	0.145842
Regulation Dummy (*DDATE*2)	43,785	0.2329904	0.422741
Regulation Dummy (*DDATE*3)	43,785	0.7452675	0.4357157
Residential Type Code Dummy (*DTC*1)	43,785	0.6751486	0.4683247
Land Type Code Dummy (*DTC*2)	43,785	0.2298583	0.4207463
Commercial Type Code Dummy (*DTC*3)	43,785	0.0949931	0.2932088
Sale Price <$50k Dummy (*DSP*)	43,785	0.6434842	0.4789755
Sale in 6-month Dummy (*DNM*6)	43,785	0.2873114	0.4525132
Sale in 6–12 month Dummy (*DNM*12)	43,785	0.3521948	0.4776597
Sale in 13–24 month Dummy (*DNM*24)	43,785	0.3163695	0.4650643
Sale in 4-month Dummy (*DNM*4)	43,784	0.0441244	0.2053737
Zip Code (*ZIP*)	43,532	65,492.89	22,242.41
Log of Zip Code (*LZIP*)	43,532	10.9793393	0.5925227

Source: derived by Authors from data provided by the RTC

Exhibit 10
Equation 1 Variable Descriptions

Variable	Description
LSP_i	Log of sale price of the ith property.
*DTC*1	Residential Type Code Dummy, included to determine if residential properties have lower than average selling prices.
*DTC*3	Commercial Type Code Dummy, included to determine if commercial properties have higher than average selling prices.
*DDATE*1	Regulation Dummy, included to determine if sales taking place during the first regulatory period experienced overall higher selling prices than those during later periods.
*DDATE*3	Regulation Dummy, included to determine if sales taking place under a later regulatory period experienced lower overall selling prices than those in previous periods.
DSP	Sale Price < $50,000 Dummy, included to determine if properties that are valued less than $50,000 give a negative contribution to the model.
*DNM*6	Sale within 6 months Dummy, included to determine if properties sold early on experienced higher or lower than average sale prices, where the default group is a sale within 4 months.
*DNM*12	Sale between months 6–12 Dummy, included to determine if properties sold after the initial marketing period experienced lower than average sale prices.
*DNM*24	Sale between months 12–24 Dummy, included to determine if properties sold in the last marketing period experienced still lower than average sale prices.
LZIP	Log of property zip code (Location Proxy), included to determine if properties in the East were selling for less than properties in the West.
LCN	Log of property condition, included to determine if better condition properties result in higher average selling prices (4 = excellent, 3 = good, 2 = fair, 1 = poor).
LRATE	Log of interest rate series, included to detemine if selling prices increase as a result of lower interest rates.
RTCFIN	Availability of *RTC* financing. Dummy variable, where prices would be expected to increase with availability of financing.
μ_i	A normally distributed random error term.

Source: Authors

months, 60% of appraised value for a sale between months six and eighteen, and 50% of appraised value for a sale after month eighteen.

The first element that we examine is the relationship of sale price to various economic and property attributes. The reason for undertaking this analysis relates to the stated objective of the RTC that it get top dollar for real estate sales, and ultimately examining whether the various regulations set forth by FIRREA impact the overall selling price of properties by the RTC. This analysis is accomplished through the application of an ordinary least squares (OLS) regression, with the model specified in log-semi-log form. This model was chosen because it provided the best fit, and is specified as[4]

$$\begin{aligned} LSP_i = {} & \beta_0 + \beta_1 DTC1 + \beta_2 DTC3 + \beta_3 DDATE1 + \beta_4 DDATE3 + \beta_5 DSP \\ & + \beta_6 DNM6 + \beta_7 DNM12 + \beta_8 DNM24 + \beta_{11} LZIP + \beta_{10} LCN \\ & + \beta_{11} LRATE + \beta_{12} RTCFIN + \mu_i. \end{aligned} \tag{1}$$

The list of variables used in the study are listed in Exhibit 10.

The results of this regression are provided in Exhibit 11. All variables are significant at the .01 level. Residential properties would be expected to sell for less, as the *DTC*1 residential dummy and the *DSP* dummy indicate. The *DDATE*1 variable is positive and significant, indicating that a significant amount of property sold at relatively higher prices during the regulatory period requiring a minimum sales price of 95% of

Exhibit 11
OLS Regression Results
Dependent Variable = *LSP*

Variable	Parameter Estimate	*T*-Value	Prob. > | *T* |
INTERCEPT	12.589952	42.424	.0001
*DTC*1	.726740	59.208	.0001
*DTC*3	1.741430	88.809	.0001
*DDATE*1	.102757	2.996	.0027
*DDATE*3	−.059020	−3.660	.0003
DSP	−1.839124	−175.806	.0001
*DNM*6	.156188	6.886	.0001
*DNM*12	.115835	5.309	.0001
*DNM*24	.171809	7.936	.0001
LZIP	−.069115	−8.692	.0001
LCN	.488297	32.117	.0001
LRATE	−.634348	−5.043	.0001
RTCFIN	−.125441	−8.208	.0001

Observations = 39,152
Adj. *R*-Sq = .6152
Source: derived by Authors

the appraised value. This is not surprising, given the short data period being measured.

Location, as proxied by *LZIP*, does have a significant relationship to sale price, as would be expected. This variable indicates that properties in the East were selling for higher prices than properties in the West. The property condition, as defined by the *LCN* variable, also has a significant relationship to sale price, as previously discussed. The interest-rate variable, *LRATE*, indicates that prices decrease as interest rates increase. The *RTCFIN* variable is negative, indicating that when RTC financing was made available there was a resulting decrease in sale price, which is counter-intuitive. But this may be influenced by the fact that the RTC only provided financing since June 1991. In this type of analysis the existence of multicollinearity may be biasing the results. The variance inflation factors in each regression were checked, and multicollinearity was not found to be a problem.[5] The model provides good explanatory power, as indicated by the adjusted *R*-square value of .6152.

The liquidity premium as defined here is measured via the *SPAV* variable, which is defined as the relationship of sale price to appraised value. An OLS regression, again in log-semi-log form, is used to relate the log of *SPAV* to the independent variables. The rationale for this analysis is to examine how efficient the RTC is in disposing of its assets. The model has the following specification:

$$\begin{aligned} LSPAV_i = {} & \beta_0 + \beta_1 DTC1 + \beta_2 DTC3 + \beta_3 DDATE1 + \beta_4 DDATE3 + \beta_5 DSP \\ & + \beta_6 DNM6 + \beta_7 DNM12 + \beta_8 DNM24 + \beta_9 LZIP + \beta_{10} LCN \\ & + \beta_{11} LRATE + \beta_{12} RTCFIN + \mu_i. \end{aligned} \tag{2}$$

The list of variables is provided in Exhibit 12. The results of this regression are given in Exhibit 13 and provide the evidence of liquidity premiums. The *DTC*1 variable representing residential property is positive and significant, indicating that

Exhibit 12
Equation 2 Variable Descriptions

Variable	Description
$LSPAV_i$	Log of sale price to appraised value ratio of the ith property.
*DTC*1	Residential Type Code Dummy, expected to have a positive relationship to *SPAV* since residential properties are the least distressed of all property types.
*DTC*3	Commercial Type Code Dummy, expected to have a negative relationship to *SPEV* because commercial properties are typically the most distressed properties, resulting in the largest discounts from appraised value.
*DDATE*1	Regulation Dummy, where sales taking place during the first regulatory period would be expected to have a positive relationship with *SPAV*.
*DDATE*3	Regulation Dummy, where sales taking place under a later regulatory period should have experienced lower *SPAV* ratios than those in previous periods.
DSP	Sale Price < $50,000 Dummy, expected to be negatively related to *SPAV*, since regulations regarding required *SPAV* ratios exempted these properties.
*DNM*6	Sale within 6 months Dummy, where this variable should have the largest coefficient relative to the other *DNM* variables.
*DNM*12	Sale between months 6–12 Dummy, expected to have a positive coefficient, although smaller in magnitude than the *DNM*6 variable.
*DNM*24	Sale between months 12–24 Dummy, expected to be positive, and having the smallest coefficient of all of the *DNM* variables, since this period allowed the greatest amount of discount.
LZIP	Log of property zip code (Location Proxy), where the higher the zip code, the further West the property is located, equating to higher price.
LCN	Log of property condition, where the better the condition of the property, the higher the expected *SPAV* ratio.
LRATE	Log of interest rate series, where *SPAV* would be expected to increase as rates decrease.
RTCFIN	Availability of *RTC* financing. Sales should occur quicker and at a higher *SPAV* if *RTC* financing is available.
μ_i	A normally distributed random error term.

Source: Authors

residential property does provide a relatively higher percentage of sale price to appraised value. The *DDATE*1 variable has a sign opposite of what would be expected, although it is insignificant. As expected, the *DDATE*3 variable, during which the acceptance of a sales price substantially lower than the appraised value is allowed, is negative and significant. Also negative and significant is the *DSP* variable, indicating that lower priced property tended to sell at a lower ratio of sale price to appraised value. The signs and magnitudes of the *DNM* variables are as expected, indicating that the longer a property goes unsold, the lower the ratio of sale price to appraised value, relatively speaking. The location (*LZIP*) and property condition (*LCN*) variables are positive and significant indicators of a higher sale price to appraised value ratio.

The interest-rate variable, *LRATE*, is insignificant in the regression. The *RTCFIN* variable is negative and highly significant. The negative sign is counter-intuitive, given that the availability of RTC financing should prompt investors to pay higher prices, thus raising the *SPAV* ratio. One obvious explanation for this is that investors are not willing to pay a premium for the use of RTC financing. Interesting to note is that the *LRATE* variable is significant in the *LSP* regression yet insignificant in the *LSPAV* regression. The explanatory power of the *LSPAV* model is not as good as the *LSP* model, as indicated by the adjusted R-square value of .1713.

Exhibit 13
OLS Regression Results
(Dependent Variable = *LSPAV*)

Variable	Parameter Estimate	*T*-Value	Prob. > | *T* |
INTERCEPT	−.911725	−6.504	.0001
DTC1	.134703	23.234	.0001
DTC3	.030920	3.338	.0008
DDATE1	−.023484	−1.450	.1472
DDATE3	−.064034	−8.407	.0001
DSP	−.187728	−37.992	.0001
DNM6	.393380	36.720	.0001
DNM12	.311520	30.230	.0001
DNM24	.208276	20.367	.0001
LZIP	.044153	11.755	.0001
LCN	.080197	11.167	.0001
LRATE	−.030332	−.511	.6097
RTCFIN	−.121469	−16.827	.0001

Observations = 39,152
Adj. *R*-Sq = .1713
Source: derived by Authors

Conclusion

The results of this analysis on RTC sales provide an indication of the relationship between the dependent variable, either the log of the sale price or sale price to appraised value ratio, and the type of property, regulation period, timing of sale in relation to the date of appraisal, geographic location of the property, and the overall condition of the property. As evidenced by the regression results in Exhibit 11, sale prices for residential properties are on the average lower than commercial properties. Sales taking place during the first regulatory period experienced overall higher selling prices than those during later regulatory periods, although the highest selling prices were achieved in the final regulatory period. As expected, properties in good or excellent condition have an overall higher sale price than properties in fair or poor condition.

The purpose of this paper was to explore whether there is a liquidity premium evident in the RTC transactions. The results of the regression with *LSPAV* as the dependent variable, as reported in Exhibit 13, provide the evidence of liquidity premiums. The *DNM* variables indicate the amount of discount present relative to extended periods of time from appraised value to sale. Established theory holds that properties sold quickly should sell at a higher sales price to appraised value ratio, thereby commanding a liquidity premium. Conversely, properties held for a longer period of time tend to command a lower overall sale price to appraised value ratio. This could imply that the appraised value was too high for the current market, or it could be an indication of other problems, such as inherent property characteristics, lack of demand for a type of property, unavailability of financing, etc.

As expected, the *DNM* variables are all positive, with the greatest contribution to *LSPAV* evident in the *DNM6* regulatory variable. The liquidity premium declines over

time, becoming increasingly smaller as the property sells further away from the date of the appraised value. Other results of the *LSPAV* regression from Exhibit 13 are for the most part also as expected. Residential properties sold for a higher *LSPAV* ratio; sales taking place in the earliest regulatory period sold for higher *LSPAV* ratios than sales in later periods; West location properties and those properties in better condition sold for higher *LSPAV* ratios. The sign on the *LRATE* variable was as expected, although insignificant. The *RTCFIN* variable was significant, although the sign was opposite of that expected.

This paper's importance relies most heavily on the finding that realistic market adjustments in regulation, over time, helped to achieve a higher degree of liquidity in RTC real estate property sales. Does this mean that the RTC has accomplished its established goals/mandates? The findings of this paper confirm the legislative intent of FIRREA, which is to ensure that real estate properties acquired by the government are disposed of at the highest dollar value possible.

Notes

[1]Information on current regulations was obtained from staff members at the RTC Southwest Region Metroplex Consolidated Office.

[2]Net takeover value is calculated at the time an asset is taken over by the FSLIC, and by definition is equal to the historic cost less any principal amortization while the loan is current, and less any writedowns recorded prior to takeover by the FSLIC (Curry et al., 1991).

[3]This study uses the appraised value at the time of the sale as the "market value" to which sales prices are related. While it has been shown that appraisals are relatively accurate proxies for sales price (Cole et al., 1986), Curry et al. (1991) argue that sales of distressed assets in their study have a significant lag between takeover by the FSLIC and the time the appraisal was subsequently done, requiring the use of net takeover value as their recovery rate input variable. Given the appraisal regulations under FIRREA, the appraisals of the properties in the RTC data used here are considered current, and the best indication of value to which the actual sales prices are related.

[4]A question concerning the assumption of a normally distributed random error term, and thus the appropriateness of the model, could be raised, given that most of the variables are dummys. The normality of the residuals in both regressions was checked, and both were found to be normally distributed, undoubtedly due to the large number of observations.

[5]Neter, Wasserman and Kutner's rule of thumb associated with the variance inflation factor (VIF) is that an independent variable with a VIF above 10 or the mean of all of the independent variables significantly above one would indicate a severe effect on the regression model. The VIF in these regressions were within the Neter et al. (1990) parameters, so it is inferred that multicollinearity is not a problem and no remedial methods are needed.

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