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A Model of the Asset Disposition Decision of the RTC

Michael Lea* and Kenneth J. Thygerson**

The purpose of this paper is to develop a model of the asset disposition decision for the Resolution Trust Corporation (RTC). In this paper, we focus on the primary goal of the RTC—to maximize the net present value of the cash flows generated through holding and selling the assets it acquires. A major decision it faces is whether to hold or sell assets. This decision ultimately depends on the RTC's discount rate versus that of the marginal buyer. A second question relates to the decision of which assets to sell first and which ones to delay sale. The model developed in this paper characterizes the asset disposition decision process of the RTC for different types of assets. We develop a set of optimal disposition rules based on the simple premise of a multi-period cash flow maximization. In addition, we test some of these rules by analyzing RTC disposition performance. Through this exercise, we hope to provide some guidance to the RTC in implementing its enormous task as well as to policy makers in charting the progress of the RTC. The main results of this analysis indicate that liquid assets and retail deposit franchises should be sold as quickly as possible. Illiquid assets that are performing and do not have high servicing costs are good candidates to finance through senior/subordinated securities or sale with seller financing by the RTC. Illiquid non-performing assets are good candidates for equity participation financing by the RTC. The sales proceeds obtained by the RTC will be increased if buyers have greater certainty with respect to expected cash flows and RTC sales policies.

The purpose of this paper is to develop a model of the asset disposition decision for the Resolution Trust Corporation (RTC). The RTC was created in 1989 to liquidate and manage the assets of failed thrift institutions. Through July 1992, the RTC has assumed control of 718 thrifts with total assets of \$382.9 billion at the time of takeover (Resolution Trust Corporation 1992). Although the vast majority of failed thrifts have been taken over, the RTC still has over \$100 billion of assets under management. The disposition strategies of the RTC will have a major impact on

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the ultimate cost of resolving financial institution failures and the performance of surviving institutions and the markets in which they operate.¹

From its inception, the RTC has been embroiled in controversy over its sales techniques. At first, it was very slow to sell assets, engendering criticism from Congress and the real estate community (Lea 1990). More recently, it has adopted a bulk sale approach to asset disposition with “. . . a philosophy of sell, sell, sell.” (*Wall Street Journal* 1991a). Exemplifying this attitude, Thomas Horton, the RTC’s deputy director of asset sales remarked, “We think the best thing in the world is if somebody makes money off us. Smart money follows smart money.” This “Jekyll and Hyde” behavior reflects, in part, the conflicting objectives of the RTC which must maximize revenue, minimize disruption to markets and reserve certain assets for preferential buyers (e.g., low income housing groups).

The Asset Disposition Decision Process

In this paper, we focus on the primary goal of the RTC—to maximize the net present value of the cash flows generated through holding and selling the assets it acquires.² A major decision it faces is whether to hold or sell assets. This decision ultimately depends on the RTC’s discount rate versus that of the marginal buyer. A second question relates to the decision of which assets to sell first and which ones to delay sale. By dealing with the financing and sales decisions of the RTC, we are extending Kane’s (1990) work on identifying and analyzing the objectives that the RTC should be focusing on.³

¹ Increased attention is being focused on problem banks which, when taken over, are managed and liquidated by the Federal Deposit Insurance Corporation (FDIC). This analysis is applicable to the asset disposition decisions of the FDIC.

² The legislation establishing the RTC listed three primary objectives with respect to asset management and disposition: (1) maximize NPV [net present value] return from sale or other disposition of such assets; (2) minimize the impact of such transactions on local real estate and financial markets; and (3) maximize the preservation of the availability and the affordability of residential real property for low- and moderate-income individuals to the extent consistent with a reasonable economic return to the corporation and subparagraphs (1) and (2). [Table V, Subtitle A, Section 21A, Paragraph i (1) of Federal Home Loan Bank Act]. We view (2) and (3) as constraints and (1) as the objective function of the RTC.

³ Kane specifically lists the roles of the salvor of imperiled assets to be as follows: (1) rescue, (2) appraisal, (3) property management and (4) sales. Kane (1990) p. 757.

A number of government policies impact both the RTC's and the private sector's discount rate and asset valuations. The RTC operates within a budget constraint. When this constraint is binding, the opportunity cost related to the RTC's cost of capital will reduce the valuation it places on the assets it holds. The availability of government funds can, therefore, affect the decision to sell assets as well as repay collateralized liabilities and sell branch deposits. The RTC also faces the problem that the value of certain of its assets and liabilities (e.g., partially completed real estate projects, mortgage loan servicing and branch deposits) can decay in value over time at unknown rates.

The financing options available to purchasers of these assets will affect their cost of capital and required purchase yields. Government policies can affect the mix of purchasers, their leverage ratios and borrowing rates as well as their ability to obtain financing. The RTC can offset some of the credit availability problems for purchasers by providing various forms of financing. However, their ability to do so is limited by their budget constraint. Also, uncertainty as to the timing and process used for selling assets can add a risk premium to the purchaser's yield requirement.

The model developed in this paper characterizes the asset disposition decision process of the RTC for different types of assets. We develop a set of optimal disposition rules based on the simple premise of a multi-period cash flow maximization. In addition, we test some of these rules by analyzing RTC disposition performance. Through this exercise, we hope to provide some guidance to the RTC in implementing its enormous task as well as to policy makers in charting the progress of the RTC.

Assets and Liabilities Of Failed Thrifts

The goal of the RTC is to maximize the net present value of the total cash flows resulting from retaining and selling of assets and extinguishing liabilities and selling branch networks of failed thrifts. Positive cash flows are generated by income generated by assets held in the RTC's portfolio and through sales. Negative cash flows are generated from interest costs of debt and the cost of servicing and managing the assets and franchises held. The net present value for any liquidation strategy is determined by discounting these cash flows at a discount rate reflecting the appropriate social opportunity cost of RTC asset ownership.

In order to understand the problem, we must first characterize the nature of the assets and liabilities the RTC inherits at the time it takes over a

failed thrift and the major factors influencing their valuation. The assets of a failed thrift can be characterized as follows:

Liquid. Readily marketable assets trading in developed secondary markets with price elastic supply and demand. Information on the characteristics and performance of these assets is good, and they exhibit relative homogeneity in characteristics. For these assets, the price determined by competitive auction is likely to be an efficient market price (i.e., the transaction price is the best predictor of future value). Examples include Treasury, mortgage-backed and investment-grade corporate securities, most one- to four-family mortgages and high-grade consumer loans.

Illiquid/Performing. Assets in markets with some price inelasticity in demand and supply. These assets lack homogeneity in asset characteristics and lack full information on performance history. For these assets, a competitive auction may not generate an efficient market price, reflecting the lack of information and disparity in assessments about future risk and inelastic demand. Examples include performing junk bonds, commercial and multi-family real estate loans and commercial business loans.

Illiquid/Non-performing. Same characteristics as illiquid above with greater uncertainty, less information and potential perishability. Examples include occupied or partially developed real estate and delinquent loans.

The value of these assets is the discounted present value of the future cash flows. Whether it is better to sell or hold any particular asset ultimately depends on the cost and availability to capital of the RTC. It is also a function of the availability of information upon which to make forecasts of the expected cash flows generated by the assets and its availability to borrowers during the due diligence process. A major task of the RTC is to quantify the relative costs of holding versus selling assets and the relative costs of capital for different financing arrangements for the retained assets.

The liabilities of thrifts are primarily composed of:

Insured Deposits. Deposits of varying maturities, callable by depositors (with penalties) and attractive to other depositories seeking to improve market share in existing markets or expand into new markets. Interest rates on this funding source are high as compared to direct RTC borrowing because of the high servicing costs and the fact that failed thrifts have paid premium interest rates to overcome consumer perception of risk of

default (even though insured) or because of risk that the buyer of the failed thrift deposits will reduce the interest rate on existing deposits.

Collateralized Debt. Varying maturity debt collateralized by the assets of the institution. Typically, these liabilities are financed at a spread over comparable Treasury maturities depending on the rating. This debt is subject to repudiation (par call) by the RTC. The other major source of collateralized debt is advances from the various Federal Home Loan Banks. The cost of this source of funds depends on when the advance was taken out. Early repayment is subject to penalty.

Financing and Sales Alternatives

The RTC can raise funds using the following options:

Treasury/Refcorp Debt. In the past, the RTC has sold its own bonds in the capital markets at a small premium over the risk-free rate. Recently, it has been relying on Treasury issued debt.

Deposits. The RTC can use failed thrifts to continue to issue new and rollover existing insured deposits.

Collateralized Borrowings. The RTC can retain existing collateralized debt of failed thrifts, repudiate or issue new collateralized securities.

Sale for Cash. The RTC can sell for cash.

Sale with Financing. The RTC can sell assets with various forms of seller financing.

Sale with Put. The RTC can sell assets with a putback to the RTC.

Sale with Equity Participation. The RTC can sell assets with an equity participation in the asset sold.

Each of these approaches to raising cash involves quite different impacts on the net cash flows to the RTC. It also impacts the cost of capital to the RTC for all assets being held in portfolio and in the case of the last three alternatives, the price the private sector will pay for the asset.

The Model

The objective we have specified for the RTC is to maximize the following function:

$$\max E(NPV) = \sum_{t=1}^n [E(NCF)_t + E(A)_t - E(OC)_t + E(F)_t] / (1 + R^{RTC})^t \quad (1)$$

where

$E(NPV)$ = expected net present value of all asset cash flows and sales proceeds less operating costs;

$E(NCF)_t$ = expected net cash flows on assets held during period t ;

$E(A)_t$ = expected net proceeds from sales of assets, A , during period t ;

$E(OC)_t$ = expected operating costs of servicing assets and liabilities and selling assets during period t ;

$E(F)_t$ = franchise value of the thrift's retail branch deposit system reflecting the discount to book value for another institution to accept the deposit liabilities of the failed institution;

R^{RTC} = RTC's discount rate.

The major factor in the RTC's valuation of assets is the discount rate (R^{RTC}) it applies to the cash flows generated by the assets. There are two possible approaches to determining the appropriate discount rate for the RTC. The first is to express it as a weighted average financing cost. This cost will reflect the mix of financing sources, including direct Treasury borrowing, retention of the failed institution's deposits and retention or issuance of collateralized debt obligations. Maximization of equation (1) using this approach leads to the result that direct Treasury borrowing is preferable to other forms of borrowing and that the RTC should replace the deposits and collateralized borrowing of failed thrifts as soon as possible after takeover.

While such action would reduce the short-run costs of resolution to the taxpayer, it also generates the result that the government should hold all assets of failed thrifts to maturity, as direct Treasury borrowing is cheaper than private sector financing (and therefore, the RTC's reservation price for assets will be higher than the bid price of private sector buyers.)⁴ This

⁴ This result ignores the tax benefits that flow to private sector buyers of assets and institutions through the tax deductibility of interest on debt, tax-loss car-

result ignores the social opportunity cost of public investment (i.e., whether they would be more productive in the long run under private sector ownership) and the potential decay rate in value while under RTC management.

The issue of the appropriate discount rate for public investment is not a new issue, having its origins in the cost-benefit literature dating back to the nineteenth century. Even for projects with clear positive externalities, a strong case can be made for using the pre-tax private sector cost of capital as the appropriate social opportunity cost of public funds.⁵ The use of a private sector cost of capital as the RTC's discount rate is strengthened by the fact that the investments of failed thrifts are pure private goods. Thus, issues such as benefit spillover or the social rate of time preference do not enter into the analysis.

Which private sector cost of capital to use as the RTC's discount rate is not straightforward, considering that it owns assets with varied duration and risk. As a decision rule, it is impractical to vary the discount rate for each asset held by the RTC. A manageable solution would be to use a discount rate reflecting average asset quality (e.g., "BBB-rated" corporate bonds) and duration (e.g., five years).⁶

An additional consideration in determining the RTC's discount rate is the potential decay rate in cash flows from assets that require intensive servicing or in the franchise value of thrift branch systems. The latter will decay over time as customers leave the failed institution for others that offer better service, higher perceived safety and more comprehensive product offerings. The former depends on the efficacy of RTC asset management. The RTC charter requires reliance on the private sector to manage assets. Indeed, the RTC has made use of private sector managers to a significant extent, although it has experienced considerable delay in shifting the assets from conservatorship to private sector management.

ryovers on failed institutions and depreciation. We argue that on a consolidated Federal budget basis, these tax benefits to the private buyer are lost revenues to the Treasury and therefore should be ignored.

⁵ For example, see Baumol (1968) and Boskin (1978).

⁶ The appropriate discount rate is a function of the risk-free rate and a market risk premium [see Follain, Hendershott and Ling (1987)]. The selection of a corporate BBB bond yield is arbitrary. Alternative measures of an appropriate risk premium could be used. The selection of a particular benchmark bond yield will primarily affect the speed of sales of RTC assets.

This consideration suggests an additional term in the RTC discount rate—the decay rate in asset or franchise value resulting from RTC management. This term would be added only to the valuation of management intensive assets (e.g., ongoing development projects) and retail franchises, not to securities or residential mortgages.

This methodology is appropriate as long as the RTC's funding is unconstrained. Once the REFCORP's borrowing capacity was used up, the RTC began to obtain funds directly from the Treasury. However, Congress has limited total borrowing by the RTC.⁷ Periodically, it has been short of working capital as the proceeds of institution and asset sales have been less than the financing and operating costs associated with the failed thrifts it controls. The opportunity cost of a binding RTC budget constraint rises as the corporation nears its funding limits. A higher discount rate lowers the RTC's valuation of assets, causing it to revise decisions to sell or retain specific assets. In that event, a shadow value of scarce RTC funds should be added to the discount rate.

The RTC's discount rate can be expressed as:

$$R_t^{RTC} = R_t^{BBB} + d_t + l_t, \quad (2)$$

where

- R_t^{BBB} = corporate BBB bond yield (intermediate maturity);
- d_t = decay rate in values of assets requiring intensive servicing, or development or possessing unique franchise value;
- l_t = shadow value of binding RTC budget constraint.

The RTC's hold versus buy decision depends on this valuation versus the market's valuation of the cash flows. Applying the appropriate discount rate to the expected net cash flows will determine the RTC's valuation or reservation price for the assets it holds. The hold versus sell decision depends on this valuation versus the market's valuation of the asset cash flows. In applying this decision rule, we assume that the market has the same information about the expected cash flows as the RTC and that both the RTC and the marginal investor have the same risk preferences.⁸

⁷ For example, before its 1991 Thanksgiving break, Congress passed legislation giving the RTC only \$25 billion of the \$80 billion it requested (*Wall Street Journal* 1991b). No new appropriations were authorized in 1992 and the impasse has continued into 1993.

⁸ The lack of information about RTC assets being held for sale has been cited as a significant stumbling block to successful sales (*Wall Street Journal* 1990).

We can now consider how the private sector buyer will value RTC assets. The discount rate used by private sector buyers will depend on their cost of capital. The private sector weighted cost of capital, R_t^{coc} , is shown as equation (3):

$$R_t^{coc} = W_d D_t + W_e E_t, \quad (3)$$

where

- R_t^{coc} = private sector buyer's weighted cost of capital;
- $D_t = (T + s)$ = cost of debt, period t ;
- T = Treasury yield;
- W_d = weight of debt in capital structure;
- s = spread of private borrower's debt over comparable maturity Treasury (T);
- E_t = equity cost, period t ; and
- W_e = weight of equity in capital structure.

The marginal private sector buyer's bid price for an asset is determined as the discounted present value (PV) of its cash flows. The variables W_d and W_e significantly impact the required return and price that the private sector marginal buyer will pay for RTC-owned assets. These weights are influenced by Congressional policies and by bank, thrift and insurance company regulatory agencies.

W_d and W_e are the debt and equity weights of the marginal private sector investor. Prior to RTC control, these weights were those of the thrift institutions that purchased the asset. Under an environment of higher capital requirements for all depositories or the outlawing of specified assets in thrift, commercial bank or insurance company portfolios, it stands to reason that W_e will increase significantly from what it was before FIRREA. Good examples are junk bonds and commercial real estate mortgages. Before FIRREA, thrifts and insurance companies were major investors in these assets. Thrifts lost their power to invest in junk bonds, while state insurance regulatory commissions limited holdings to 20% of assets. This made the marginal buyer of junk bonds a less leveraged investor. The same was true for commercial real estate mortgages. This effect is also

We view the provision of information as an operational issue (i.e., there is no intrinsic reason why the RTC cannot provide full information to prospective buyers). Also, it is possible that the government is less risk averse than the marginal private sector investor. If so, some risk shifting back to the government may be optimal (e.g., such as through seller financing and participation loans).

felt with respect to the lending by financial intermediaries to investors in RTC-held assets. As lending requirements and capital requirements tightened, leveraged buyers of RTC assets experienced a rising weighted cost of capital (in the limit $W_e = 100$ and $W_d = 0$). Thus, public policy clearly influenced the market discount rate, R^{coc} , that private sector buyers apply to these investments.

The discount rate used by the private sector also will incorporate a risk premium reflecting a marginal potential buyer's concern over the impact that the RTC's disposition policy will have on market prices. It is certainly possible that large RTC sales of particular assets could impact the market price of these assets during the RTC's disposal period. This seemed to be true for junk bonds in the fall and winter of 1990, when large RTC sales of bonds coincided with the widening of the junk/Treasury spread to the highest level ever, and has been a source of continuing concern for real estate. Clearly, it is more of a concern for illiquid performing and non-performing assets. Also, the fact that the RTC can change the rules of the game with respect to disposition techniques can increase the due diligence costs and the risk premium for asset purchasers [see *Wall Street Journal* (1991c)].

Therefore, the discount rate used to determine a private sector buyer's bid price for an asset will reflect the cost of capital and the uncertainty over RTC disposition policy. Thus,

$$R_r^{pc} = R_r^{coc} + u_r, \quad (4)$$

where u_r = risk premium related to uncertainty over the pricing of assets by the RTC and their disposition (e.g., the risk the RTC may change the rules of the game).

Disposition and Financing Decision Rules

If $R^{pc} > R^{RTC}$ for assets where the RTC and the marginal buyer in a competitive bidding situation have the same expectations with respect to expected cash flows and risk, then it makes sense for the RTC to sell the asset.⁹

⁹ We ignore the special problems the RTC has as a result of the lack of bidders and the heterogeneous nature of the bidders for many of their assets. As Milgrom and Weber (1982) have shown, with heterogeneous bidders the price obtained must only be enough to make the NPV of the second highest bidder negative. This will not net the RTC the price the highest bidder would be willing to pay. For many of the assets held by the RTC buyers are heterogeneous and worse, few in number.

Decision Rule One. *If $R^{pc} > R^{RTC}$, then the asset should be held.*

Using the discount rate suggested above, the RTC should sell liquid investment grade or government securities and conforming mortgages as soon as possible as there is little uncertainty over valuation and a relatively low private sector discount rate.

For other assets, it is unclear whether R^{RTC} is greater than R^{pc} . If not, application of this decision rule could lead to the RTC holding the remaining assets. Perhaps recognizing this outcome, Congress has imposed a budget constraint on the RTC. The budget constraint forces the RTC to sell assets, in effect generating a positive value for l_t from equation (2) and raising the RTC's discount rate. The value of l_t is subjective but can be operationalized through a prioritizing of assets for sale. The RTC should sell the assets whose $E(NPV)$'s are closest to the private sector's highest bid price. These assets will invariably be the lower risk and higher liquidity assets where the $E(NPV)$ for the private sector buyer is computed at a low u and high L/V . Thus, the RTC should rank assets for sale according to equation (5):

$$\min(DIF) = R^{pc} - R^{RTC} = [R^{coc} + u] - [R^{RTC} + d] \quad (5)$$

This approach leads to the following decision rules.

Decision Rule Two. *Dispose of assets with the smallest difference, DIF , between R^{RTC} and R^{pc} .*

This will result in the market price received by the RTC being closest to the RTC's $E(NPV)$.

Consideration of the individual elements of R^{RTC} and R^{pc} suggests that the RTC can influence DIF . The partial derivatives of DIF with respect to u , d , and L/V are as follows:

$$d(DIF)/d(u) > 0;$$

$$d(DIF)/d(L/V) < 0; \text{ and}$$

$$d(DIF)/d(d) < 0.$$

These partials give us a companion set of decision rules.

Decision Rule Three. *Minimize buyer uncertainty, (u).*

The RTC should set and announce decision rules and sales procedures and make sure that adequate information is available to all buyers on a timely basis.

Decision Rule Four. *As a corollary to Decision Rule Two, minimize the market uncertainty caused by large bulk sales of illiquid assets.*

Assets traded in secondary markets with highly inelastic demand curves are most susceptible to large values of u and likely to experience the largest price impacts from an aggressive sales program by the RTC. Performing commercial real estate and mortgages and junk bonds are good examples. These assets should be sold last by the RTC. One alternative would be to use these assets as collateral in senior/subordinated structured securities to raise cash if necessary.

Decision Rule Five. *Facilitate the ability of buyers to obtain higher financial leverage.*

The lack of financing of RTC assets clearly reduces bid prices and increases taxpayer cost of asset disposition. Provision of seller financing by the RTC will minimize *DIF*. Also, it will promote risk sharing which may reduce *DIF* if buyer and seller risk preferences are significantly different, particularly for the riskier and harder to sell assets in the RTC's portfolio. Assets with high default risk, uncertain cash flows, illiquidity and a high decay rate should be considered for sale with RTC equity participation financing. In October 1992, the RTC announced plans for a new program which would bring in private asset managers as joint venture partners to help sell distressed properties.¹⁰ This program is suggested by this decision rule.

Decision Rule Six. *Dispose of illiquid assets with high decay rates, d , that require highly specialized servicing or development skills to maintain or enhance value.*

Another group of assets that the RTC should be concerned about is assets with high decay rates. These include mortgage servicing contracts, assets whose value depends on the quality of servicing (e.g., assets where col-

¹⁰ See Barsky (1992).

lection activities impact credit losses significantly such as consumer and business loans) and unfinished direct real estate investments and foreclosed property where significant future tenant improvements are necessary. These assets require intensive servicing activities or development talent. To obtain this talent, the servicer of the assets should have an equity position in the assets.

Decision Rule Seven. *Sell retail branches and deposit bases as quickly as possible.*

This decision rule is also important because selling the branches of failed thrifts will improve performance of the remaining institutions in the depository market by eliminating the high rates paid by failed thrifts as well as by facilitating consolidation in a market characterized by overcapacity. In this case, the partial differential of equation (6) is $d(R^{RTC})/d(d) > 0$, therefore, $d(DIF)/d(d) < 0$. The RTC's Accelerated Resolution Program (ARP), developed in 1991, is designed to sell weak institutions before they are taken into receivership.¹¹ The model presented here would support the use of the Accelerated Resolution Program. Indeed, the use of it early in the RTC's life would likely have reduced losses significantly.

Decision Rule Eight. *Do not dispose of RTC assets by allowing the buyer a putback to the RTC.*

The RTC has given purchasers of asset pools and retail branch systems putback options with respect to assets purchased.

This technique has apparently been used to facilitate large bulk sales and to overcome a lack of detailed information about the assets. In theory, the granting of a put option with an asset sale can reduce buyer uncertainty and potential market disruption caused by large bulk sales. Thus, it could be used for sale of illiquid or hard to value assets. The put option has considerable value to buyers, and the RTC should collect explicit up-front fees from purchasers.

The RTC does not appear to collect explicit fees for the put options it grants. It has been argued that the value of these options is embedded in the prices it obtains for the sale of branch systems or other assets. However, if the option is not explicitly priced, it is impossible to determine

¹¹ This program was initially suggested in 1989 (see Kormendi et al. 1989). To date, few ARP transactions have taken place, and the RTC continues to hold branch systems for many months before sale.

if this is true. Rather, the use of puts appears to be justified mainly on the basis of expediency. In effect, asset puts allow private sector buyers to avoid competitive bidding situations or alternatively, reflect a lack of time taken by the RTC to evaluate the package of assets to determine its expected cash flows. Either situation will enrich the buyer at the expense of the RTC.

For purposes of accountability, as well as maximizing $E(NPV)$, the RTC should charge fees for the put options. Unfortunately, valuing puts on assets with unknown or difficult to estimate distributions of expected returns and poor marketability is a nearly impossible task. Thus, use of this sales technique should probably be discontinued.

How Has the RTC Done?

Table 1 shows the assets of all institutions operated by the RTC as conservatorships and receiverships. The assets are classified according to their liquidity and servicing costs.

The sales of RTC assets to date are reflected in Table 2. This table reflects the period from inception to July 1992.

It is hard to say anything definitive about the RTC results to date based on publicly available data. We can say, however, in light of the RTC budget constraint, they seem to hold excessive amounts of liquid assets in the form of cash, investment securities and mortgage-backed securities. They also have large performing portfolios of one to four-family mortgages that our model suggests should be sold quickly. A significant portion of securities sales have been junk bonds that may have created a large value of u , particularly during the period noted in reports during the fall and winter of 1990.

A large portion of RTC asset sales have been with puts, which is very hard to support.¹² Through July 1992, the RTC sold over \$68 billion of assets with putbacks. Through July 1992, over \$22 billion of these assets have been putback to the RTC. Table 3 provides additional data on these putback sales.

The use of asset put options in conjunction with thrift branch sales makes it extraordinarily difficult to assess the prices obtained for the franchises

¹² James (1991) reports significant use of putbacks in the sales of assets of failed FDIC commercial banks. There is no rationale given for their use, however.

Table 1 ■ Assets of failed thrifts operated by RTC as conservatorships and receiverships: July 1992 (dollars in billions).

Asset Classification	Dollar Amount	Percent of Total*	Asset Liquidity Classification
Cash and Investment Securities	10.9	9.0	Liquid
Mortgage-Backed Securities	4.2	3.5	Liquid
Performing Loans:			
One- to Four-Family	19.6	16.1	Liquid
Construction and Land	5.3	4.3	Illiquid/ High Servicing
Other Mortgages	19.6	16.2	Illiquid
Other Loans	4.8	3.9	Illiquid/ High Servicing
Delinquent Loans:			
One- to Four-Family	2.1	1.7	Illiquid/ High Servicing
Construction and Land	6.8	5.6	Illiquid/ High Servicing
Other Mortgages	9.8	6.3	Illiquid/ High Servicing
Other Loans	2.6	2.2	Illiquid/ High Servicing
Real Estate Owned	14.5	11.9	Illiquid/ High Servicing
Subsidiaries	8.2	6.7	Illiquid/ High Servicing
Other Assets	14.0	11.6	Illiquid/ High Servicing
Gross Assets	121.5	100	

* May not add to 100% because of rounding.

Source: *RTC Review*. Resolution Trust Corporation, Washington, DC. III (9): 2.

or assets. In effect, it allows purchasers to “cream skim” thrift assets and may complicate the sale or financing of remaining assets (e.g., by reducing the pool diversification in RTC securities). At a minimum, the RTC should charge explicit fees for the options it conveys. However, the difficulty in valuing the options (and providing the appropriate accountability to Congress and the Oversight Board) suggests that they should not be used.

Beginning in the second half of 1991, the RTC began to make use of collateralized financing techniques. Such sales hold promise in reducing the RTC’s performing mortgage inventory. These securities have been credit enhanced through senior subordination, reducing buyer uncertainty related to liquidity and lack of credit information.¹³

¹³ The RTC reported that they filed a shelf registration of \$4 billion in April 1991. Through April 1992, the RTC sold \$19.1 billion of mortgage-backed securities. See *RTC Review*. Resolution Trust Corporation. III (9): 10.

Table 2 ■ Sales and collection of assets by type by RTC from inception to July 1992 (dollars in billions) net of putbacks.

Asset Classification	Dollar Amount**	Percent of Total**	Asset Liquidity Classification
Securities	115.7	42.3%	Liquid/Except Junk Bonds
Mortgages	114.3	41.8	Liquid One- to Four-Family Illiquid All Other
Other Loans	22.3	8.2	Illiquid/ High Servicing
REO	9.0	3.3	Illiquid/ High Servicing
Other Assets	12.0	4.4	Illiquid/ High Servicing
Total Sales	273.3	100	

* May not add because of rounding.

Source: *RTC Review*. Resolution Trust Corporation, Washington, DC. III (9): 5.

Table 3 ■ RTC asset putback sales and putback experience (RTC inception through July 1992) (dollars in billions).

Asset Type	Sales (in Dollars)	Asset Putbacks (in Dollars)	Net Sales (in Dollars)
Securities	20,765	468	20,297
Mortgages	40,155	18,552	21,603
Other Loans	6,421	3,050	3,371
REO	200	54	145
Other Assets	1,432	779	653
Totals	68,973	22,904	46,069

Source: *RTC Review*. Resolution Trust Corporation, Washington, DC. III (9): 6.

Summary and Conclusions

This paper has developed a model to determine the optimal asset sales strategy for the RTC. The model seeks to maximize the $E(NPV)$ of the assets acquired by the RTC. It provides the means to determine the sequence for optimal sales of assets by type of asset. The main results in-

dicate that liquid assets and retail deposit franchises should be sold as quickly as possible. Illiquid assets that are performing and do not have high servicing costs are good candidates to finance through senior/subordinated securities or sale with take-back financing by the RTC. Illiquid non-performing assets are good candidates for equity participation financing by the RTC. The RTC should refrain from selling assets with puts.

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