

THE HANDBOOK OF

COMMERCIAL  
MORTGAGE-BACKED  
SECURITIES

Second Edition

Edited By

Frank J. Fabozzi  
and  
David P. Jacob

The Handbook of  
Commercial  
Mortgage-Backed  
Securities  
Second Edition

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Published by Frank J. Fabozzi Associates  
in conjunction with  
Nomura Securities International, Inc.



Cover design by Scott C. Riether



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ISBN: 1-883249-49-X

Printed in the United States of America

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## Chapter 3

# Commercial Mortgage Default Rates and Loss Severity

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### INTRODUCTION

In this chapter we discuss Fitch IBCA's study of loan performance within commercial mortgage-backed securities (CMBS) transactions. The study examines default frequency and loss severity for certain Fitch-rated transactions issued between 1991 and 1996. The study investigates the extent to which certain loan, collateral, and transaction characteristics affect commercial mortgage loan performance. Each characteristic is examined separately for its effect on default and loss using univariate analysis. Several types of multivariate analysis are also performed to determine whether these characteristics, in combination, are a better predictor of loan performance than they are individually. This study also examines the difference in default frequency and loss severity between Resolution Trust Co. (RTC)/thrift transactions and private label/conduit transactions and the effects of servicer flexibility on loan resolutions.

### DATA AND STATISTICAL METHODOLOGY

Default frequencies are reported as average annual rates of each of the numerically weighted independent variables, including debt service coverage ratio (DSCR), property type, state, loan size, interest rate type, loan type, servicer flexibility, and foreclosure type. Loss severities are reported as average loss rates for

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The authors thank Don Belanger, Kevin Kendra and Brian Home for their contribution in preparing this chapter.

each of the independent variables. In addition, average loss rates are broken down into components of loss and on a transaction-by-transaction basis. In reporting its results, Fitch IBCA has noted which default and loss rates were determined not to be statistically significantly different from one another. A lack of significance indicates either equality of results or a sample size too small to allow any conclusions to be made.

Fitch IBCA's database contains 18,839 loans in 33 transactions with a total principal balance of approximately \$16.1 billion. (See Exhibit 1.) The sample includes performing multiborrower transactions issued between 1991 and mid-1996 and rated by Fitch IBCA. All transactions had at least one year of seasoning as of the July 1997 cutoff date for the study; all transactions contain loans with diverse collateral and loan characteristics. Transactions with special characteristics, such as those with loans backed exclusively by credit leases or nursing homes, were not included.

The database contains two distinct subpools: one made up of thrift-quality loans, which come mainly, but not exclusively, from RTC transactions; and one consisting of conduit loans, which are from more recent, private label transactions. The thrift loans, which constitute 84%, by number, of the overall portfolio, are more seasoned (Fitch IBCA lacks precise origination date information for loans in several of the older transactions), relative to the conduit loans, and were originated with different underwriting and lending standards. Fitch IBCA recognizes that these factors, in conjunction with the brief period of time over which loan performance is being measured, may have an effect on the results of the study.

## DEFAULT RATES AND LOSS SEVERITY

The average annual default rates reported in this study are a function of the number of actual loan defaults and the age of the loans as calculated from the date of securitization. Fitch IBCA defines a default as a loan that is 60 days or more past due on a debt service payment or 90 days or more past due on a balloon payment. Defaulted loans that become current at a later date are still considered to be a defaulted loan to avoid double counting. Of the 18,839 sample loans, Fitch IBCA observed 3,134 defaults (3,002 of which are from RTC transactions), representing approximately 12% of the total loan balance. The average annual default rate for the entire portfolio is 4.3%.

There are significant differences in default rates between the subpools — RTC loans had an average annual default rate of 4.37%, while conduit loans had an average annual default rate of 1.97%. This difference may indicate qualitative differences between the pools, but it also may be the result of other factors, such as a seasoning effect. In any case, these default rates are based on historical performance and should not be used to project the percentage of loans that default over the life of a transaction.

**Exhibit 1: Multiborrower Commercial Mortgage-Backed Securities Database**  
(As of Securitization Date)

Transaction Name	Securitization Date	Number of Loans	Geographic Concentration*	Property Type Concentration	Fixed-Rate Loans (%)	Balloon Loans (%)	Comments
RTC 1991-M6	December 1991	391	75% CA; 7% AZ	100% Multifamily	22	98	60% of loans originated by FarWest
RTC 1991-M7	December 1991	591	27% OH; 9% FL	100% Multifamily	43	71	27% of loans originated by Mid-America Federal
RTC 1992-M3	April 1992	1,432	18% MN; 13% FL	100% Multifamily	62	63	Loans originated by 93 institutions nationwide
RTC 1992-C4	June 1992	2,694	13% PA; 12% NJ	18% Office; 17% Retail	43	70	14% of loans originated by Great American Federal
RTC 1992-C5	July 1992	3,591	12% CO; 9% KS; 9% OH	21% Retail; 18% Office	43	60	Loans originated by 46 institutions nationwide
RTC 1992-CHF	October 1992	1,763	77% CA; 6% FL	47% Multifamily; 33% Retail	23	95	All loans originated or purchased by HomeFed Bank
SASCO 1993-C1	March 1993	683	61% CA; 6% MI	34% Retail; 31% Multifamily	63	92	Loans purchased from the RTC by Lehman Brothers
KPAC 1993-M1	May 1993	57	43% CA; 10% CO	100% Multifamily	100	100	Loans acquired by Kidder Peabody
Mortgage Capital Funding 1993-C1	September 1993	61**	62% NC; 15% TX	47% Multifamily; 33% Retail	64	96	78% of loans acquired from 1st Home Federal Savings & Loan
Salomon Brothers Mortgage 1993-C1	September 1993	19	17% PA; 13% MO	100% Retail	100	22	Loans acquired by Salomon from Aetna Life
New England Mutual Life 1993-1	December 1993	193	15% CA; 10% PA	37% Office; 25% Industrial	100	89	Originated by new England Mutual Life; 8% restructured
Phoenix Real Estate Securities 1993-1	December 1993	102	22% CA; 16% NY	39% Retail; 24% Multifamily	87	94	Loans originated by Phoenix Home; 11% restructured
RTC 1993-C3	December 1993	984	23% CA; 13% AZ	43% Multifamily; 14% Office	61	82	Loans originated by 237 institution nationwide
Merrill Lynch 1994-M1	April 1994	83	27% CA; 15% TX	100% Multifamily	97	96	Loans originated by American Savings and Loan; 35% restructured
Commercial Real Estate Securities 1994-1	July 1994	263	58% WA; 19% CA	26% Multifamily; 20% Retail	70	64	Loans acquired by Gentra Capital from Pacific First; 15% restructured
FDIC 1994-C1	August 1994	1,806	21% NY; 11% TX	29% Office; 20% Retail	66	80	24% of loans originated by American Savings Bank; 12% subperforming
ACP Mortgage, L.P. 1994-1	November 1994	23	87% CA; 5% UT	29% Mixed Use; 52% Multifamily	13	56	Loans acquired by Argo from CalFed; 19% restructured

## Exhibit 1 (Continued)

Transaction Name	Securitization Date	Number of Loans	Geographic Concentration*	Property Type Concentration	Fixed-Rate Loans (%)	Balloon Loans (%)	Comments
Nomura Asset Securities 1994-C3	November 1994	55	14% TX; 12% FL	61% Multifamily; 11% Manufactured Home	100	83	30% of loans originated by Arbor National and 28% originated by Nomura
RTC 1994-C2	November 1994	1,566	33% CA; 13% NJ	38% Multifamily; 18% Office	51	75	26% of loans originated by the RTC
American Southwest 1994-C2	December 1994	39†	23% NY; 18% MI	35% Multifamily; 30% Office	100	100	Loans acquired by DLJ from Connecticut Mutual
SASCO 1995-C1	January 1995	208	27% CA; 25% PA	34% Retail; 28% Multifamily	82	85	57% of loans originated by Westinghouse; 40% acquired by Lehman Brothers
RTC 1995-C1	June 1995	1,109	31% CA; 20% FL	65% Multifamily; 9% Retail	70	89	40% restructured and modified loans
LB 95-C2	October 1995	77	18% FL; 15% TX	39% Multifamily; 22% Hotel	100	84	
Morgan Stanley Capital 95-HF1	October 1995	112	23% CA; 12% FL	52% Self Storage; 40% Manufactured Housing	0	100	
Prudential Securities 95-MCF2	December 1995	85	17% CA; 14% TX	44% Retail; 21% Multifamily	100	88	Most of the loans were originated by Midland
J.P. Morgan 96-C2	January 1996	91	24% TX; 17% CA	42% Multifamily; 23% Retail	100	97	
Salomon Mortgage Securities VII 96-C1	February 1996	43	23% GA; 14% TX	35% Multifamily; 31% Retail	100	100	100% of the loans were originated by Salomon
Asset Securitization Corp. 96-D2	March 1996	124	16% TX; 12% CA	26% Multifamily; 23% Hotel	100	17	78% of the loans originated by NACC
Merrill Lynch 96-C1	April 1996	159	21% CA; 13% NV	53% Multifamily; 32% Retail	100	96	46% of the loans originated by First Union
DLJ 1996-CF1	May 1996	93	26% TX; 15% CA	35% Retail; 34% Multifamily	100	83	95% of the loans originated by Column Financial
Citi/Conti (Mortgage Capital Funding 96-MC1)	June 1996	162	14% NY; 13% CA	45% Multifamily; 31% Retail	93	97	
J.P. Morgan 96-C3	June 1996	104	20% CA; 19% TX	29% Multifamily; 28% Retail	100	92	17% of the loans originated by Home Savings FSB
Chase/Bear 1996-1	July 1996	87	18% NY; 10% TX	45% Retail; 37% Multifamily	100	98	63% of the loans originated by Chase
Total		18,839					

\* As a percentage of principal balance. \*\* Including two mortgage participations. † Effectively 30 loans.

Fitch IBCA observed a total of 795 losses (782 of which are from RTC transactions). Losses are defined as the loan balance at securitization plus interest advanced and property protection expenses less amortization, property income, and property sales proceeds. The average loss rates are calculated as a percentage of the loan balance at securitization, rather than at default, so that they can be directly compared to the subordination levels at securitization. The study includes only those losses incurred on loans that have been completely resolved and feels that calculating losses as of the date an asset becomes REO may not capture the full loss associated with an asset due to the potential difference between the estimated value of the property, as represented by the REO transfer value, and the sales price realized for the asset when it is ultimately sold in the market.

## DEBT SERVICE COVERAGE RATIO

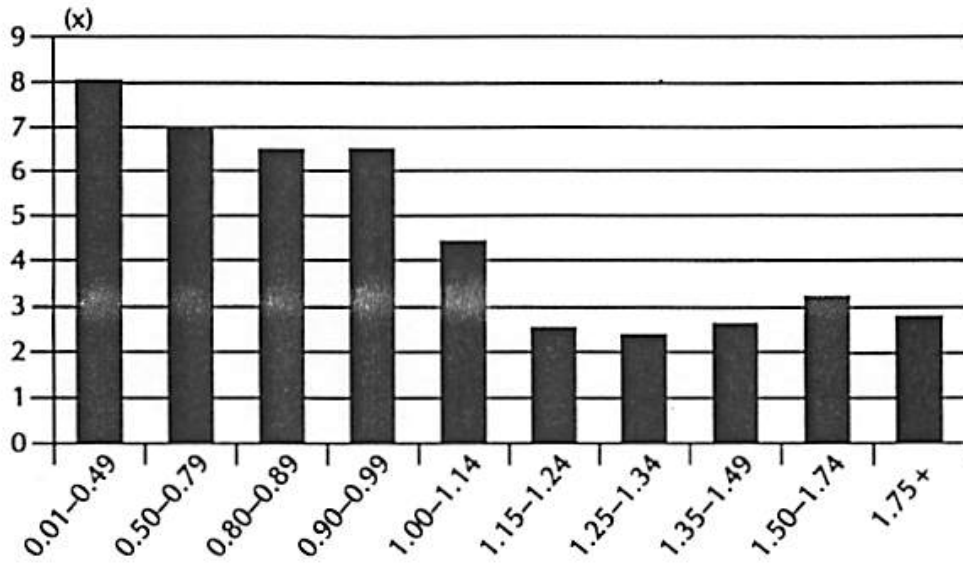
One of the characteristics, or independent variables, of commercial loan performance studied is DSCR. Default rates are measured using DSCR at securitization. The DSCRs reflect stressed refinance rates, amortization terms, and reunderwritten net cash flows. Fitch IBCA computed DSCRs for only those loans with reliable cash flow information. While loan-to-value ratio (LTV) may also explain the performance of the loans, such data were largely unavailable or unreliable, particularly with respect to loans in RTC transactions.

The 3,134 defaulted loans in the sample were stratified into one of 10 debt service coverage categories, or "buckets," which correspond to DSCR buckets in Fitch IBCA's performing multiborrower transaction model. The results show that DSCR is an important factor in explaining commercial loan defaults. As seen in Exhibit 2, the general trend is for loans with low DSCRs to have substantially higher average annual default rates than loans with high DSCRs. In fact, loans with a DSCR of less than 1.0 times ( $\times$ ) had an average annual default rate that was approximately 2.5 $\times$  higher than loans that had DSCRs of 1.25 $\times$ –1.34 $\times$ .

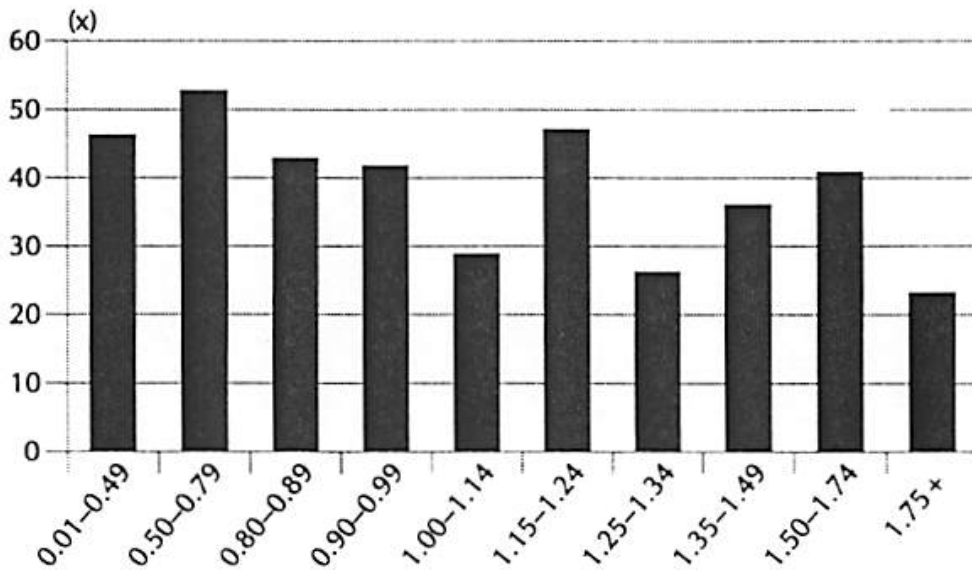
The RTC/thrift loans, when analyzed separately, show a very similar trend, although the default rate did not decline as significantly at the higher DSCRs. The private label/conduit loans exhibit the same general trend, but it is not as clearly defined due to the relatively small number of defaults. Neither analysis showed any statistical significance.

DSCR was not as clear a predictor of loss severity as it was of default frequency. (See Exhibit 3.) There was a trend of decreasing loss severity as DSCR increased, but with some aberrations, and none of the results having statistical significance. In an example of the aberrations, the average loss for loans in the 0.01 $\times$ –0.49 $\times$  DSCR bucket are 46.3%, and the average loss for loans in the 1.15 $\times$ –1.24 $\times$  bucket are 47.1%. This appears to be a result of the small number of loss observations in all but the 0.01 $\times$ –0.49 $\times$  DSCR bucket.

*Exhibit 2: Default by Debt Service Coverage Ratio*



*Exhibit 3: Loss by Debt Service Coverage Ratio*



The RTC/thrift loans show much the same result, with a generally downward loss severity trend as DSCR increased. The private label/conduit loans have so few losses (13 loss observations) that no trend is discernible and any conclusions are unreliable.

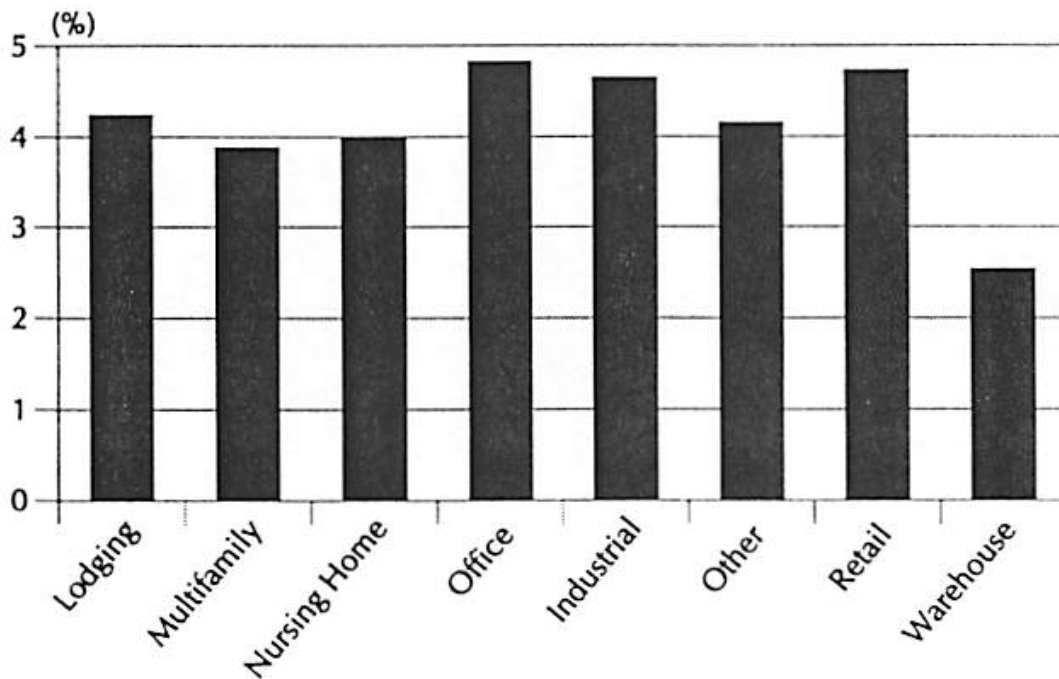
### PROPERTY TYPE

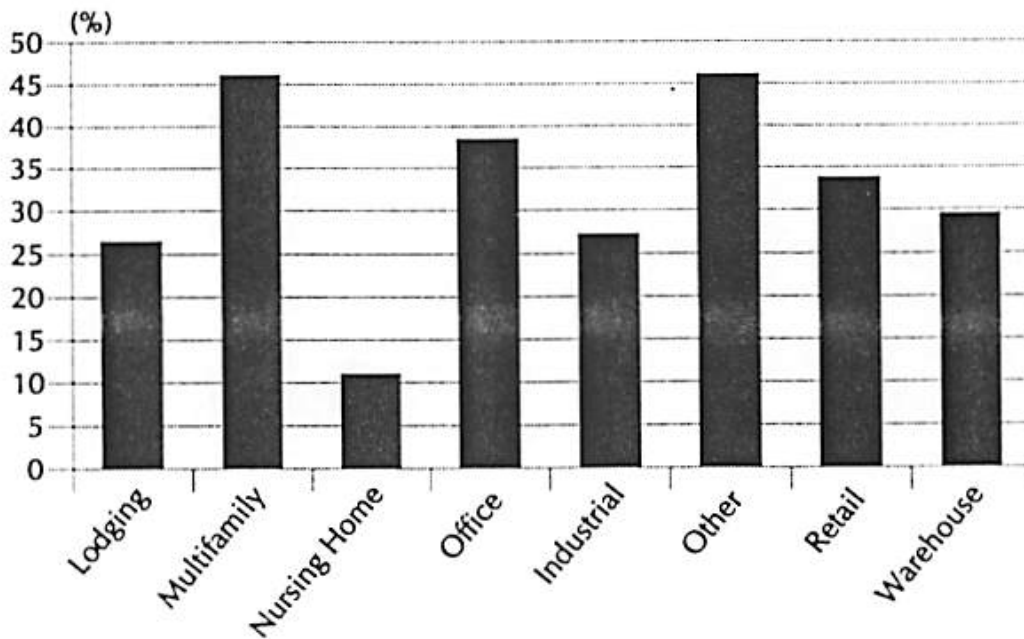
The default rate by property type is reported in Exhibit 4. Loans that were secured by warehouses had the lowest average annual default rate, at 2.5%, with multifam-

ily properties having the next lowest rate, at 3.9%. Both warehouse and multifamily property default rates were considerably lower than all other property types. This is an expected result considering the fungibility and low capital cost of warehouse space and the very slow obsolescence and stability of multifamily properties. The average annual default rate for lodging properties was approximately midrange for all property types at a rate of 4.2%, which is surprisingly low due to the volatility of hotel cash flows. However, this is most likely a result of there being very few lodging properties in the sample and the strong hotel market during the period studied. Office and retail properties had the highest default rates, at 4.8% and 4.7%, respectively. Though higher than anticipated, this is not a totally unexpected result, as office buildings have high capital costs relating to tenant improvements, leasing commissions, and replacement reserves, which may cause added stress on the property during times of significant tenant roll. The high retail default rate may be due to the significant percentage of unanchored retail and retail strip centers, which are more volatile and subject to event risk than malls and anchored community centers that were prevalent in thrift loan portfolios.

The RTC/thrift loans showed very similar results, with the exception of lodging properties, which had the highest default rate, at 5.6%. Private label conduit loans showed results that were similar to overall portfolio results, in that office and retail properties had the highest average annual default rates and lodging properties were much lower than expected. This is likely a result of there being very few lodging properties in the sample (four observations) and relatively few observations overall.

*Exhibit 4: Default by Property Type*



*Exhibit 5: Loss by Property Type*

The loss by property type is shown in Exhibit 5. The average loss for multifamily properties was a very high 46.0%. This result was the highest loss rate for any property type. This may be due to the fact that many of the loss observations are high-leverage loans from RTC/thrift transactions, several of which had significant concentrations in real estate depressed areas, such as California. Nursing homes had the lowest average loss rate of any property type, at 10.9%. This is explained by the small number of nursing home properties that suffered losses (seven nursing home properties experienced losses compared with 299 multifamily properties). None of these results was statistically significant.

The RTC/thrift loans had almost identical results as the total pool, with the exception of multifamily properties having a slightly higher loss at 46.3%. There were so few losses (13 loss observations) among the private label/conduit loans that only multifamily and industrial properties produced any results. None of the findings was statistically significant.

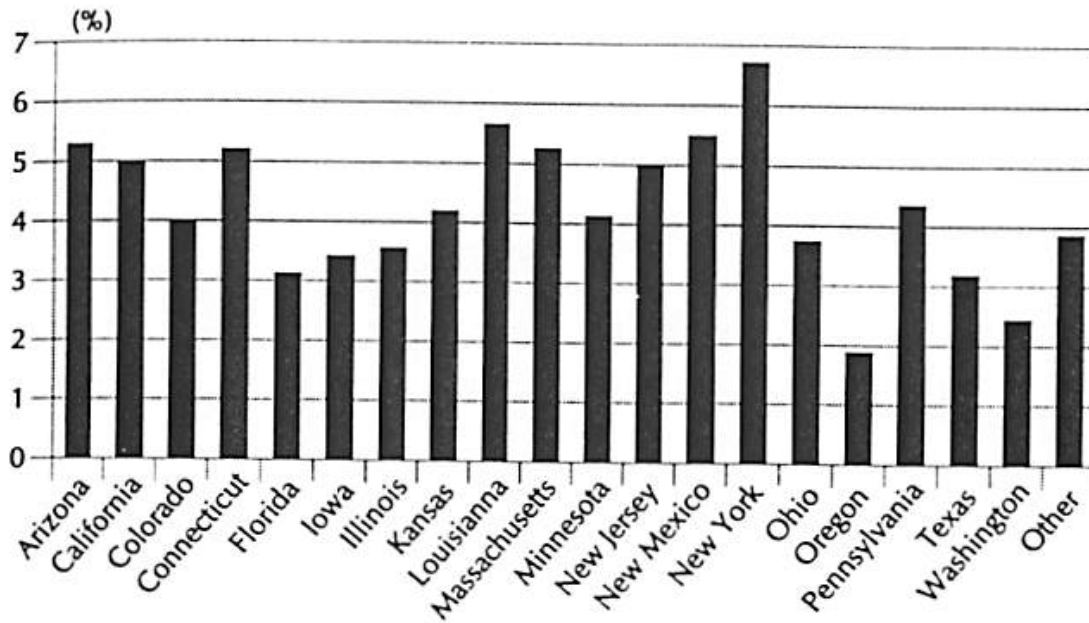
## GEOGRAPHIC LOCATION

Exhibits 6 and 7 show the default rate and loss rate, respectively, by state. The average annual default rates for loans secured by properties in Oregon and Washington were significantly less, at 1.8% and 2.4%, respectively, than loans secured by properties in any other state and were much lower than the default rates for New York, Connecticut, and Massachusetts, as well as California and Louisiana, all of which had average annual default rates between 5.0%–6.7%. Fitch IBCA feels that geographic diversity within a loan pool is a positive attribute that lessens some of the risk of regional economic and business cycle stresses. This

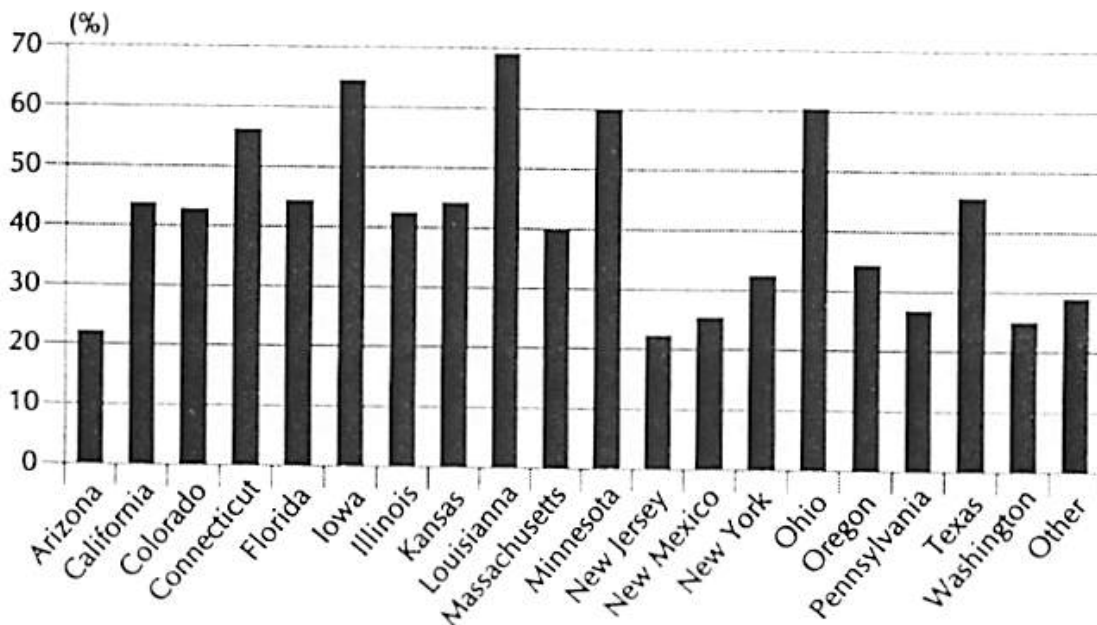
appears to be born out to some degree in the findings — while the Northeast and California were experiencing economic downturns, the Pacific Northwest was not affected to the same degree. (At the same time, Fitch IBCA recognizes that other factors may also have contributed to the outcome.)

The RTC/thrift loans, analyzed separately, had very similar default rate results and, while the private label/conduit loan results showed Connecticut and New York with the highest default rates, those levels were generally lower than those from the whole pool and the RTC/thrift loans.

*Exhibit 6: Default by State*



*Exhibit 7: Loss by State*



Several of the states that had the highest average annual default rates — California, Connecticut, and Louisiana — also had the highest average loss rates, at 43.7%, 56.1%, and 69.0%, respectively. The lowest average loss rates were attributed to Washington, New Jersey, and Pennsylvania, at 25.0%, 22.4%, and 26.8%, respectively. These results are all statistically significant.

The RTC/thrift loans had much the same results as the overall portfolio, with California, Connecticut, and Louisiana among the states with the highest loss rates, at 44.5%, 56.0%, and 69.0%, respectively.

Private label/conduit loans had so few losses that only six states were represented in the analysis, with California and New York being the only states with more than one loss observation. As a consequence, the results of the analysis were not meaningful or statistically significant.

## JUDICIAL VERSUS POWER-OF-SALE FORECLOSURES

As discussed, the effect of geographic location on default rates and loss severity is real and quantifiable. But, with respect to geographic location as a characteristic, are regional economic stresses the sole explanation for the disparity among default rates and loss severity results? Fitch IBCA believes that additional explanatory power may lie in each state's method of loan resolution. Foreclosures handled judicially take longer, on average, and result in higher losses than nonjudicial foreclosures, which take place in power-of-sale states. This is supported by the findings of a 1997 study of life insurance company loans, which showed that judicial foreclosures had losses that were 8% higher, on average, than nonjudicial foreclosures.<sup>1</sup> The study also showed that 72% of all foreclosure activity occurred in power-of-sale states.

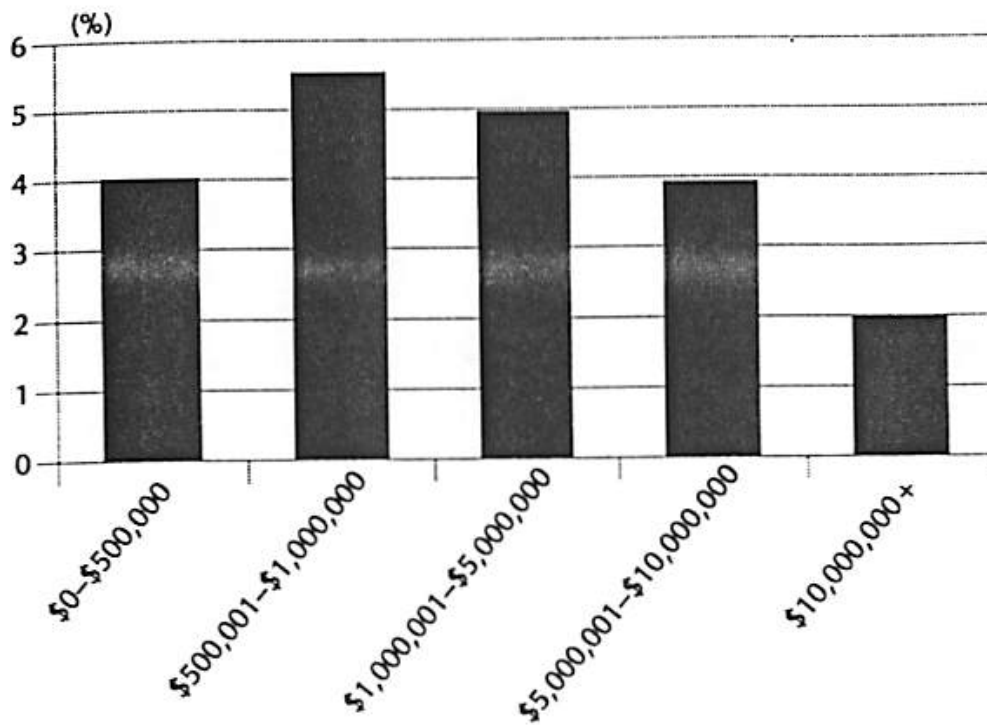
In Fitch IBCA's study, power-of-sale states have average losses of 39.6%, while judicial states had losses of 38.4%. Although the difference in average loss is slight, and the results are not statistically significantly different from each other, this seems at odds with earlier research. However, additional analysis, which took all foreclosed loans, without regard to geographic location, separated judicial foreclosures from nonjudicial foreclosures. Fitch IBCA found that loans resolved by nonjudicial foreclosure averaged losses of 61.5%, while loans resolved by judicial foreclosure averaged losses of 87.4%. Also, by absolute number and on a percentage basis, the majority of foreclosures took place in power-of-sale states.

As expected, the method of loan resolution had significant impact on loss severity, but very little discernible impact on average annual default. Power-of-sale states had an average annual default rate 4.2%, while judicial states had an average annual default rate of 4.4%, with the results not being statistically significant.

The RTC/thrift loans showed the same results as the overall portfolio and were statistically significant. The private label/conduit loans exhibited results that were not statistically significant.

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<sup>1</sup> Brian A. Ciochetti, "Loss Characteristics of Commercial Mortgage Foreclosures," 1997.

*Exhibit 8: Default by Loan Size*

## LOAN SIZE

There are two different schools of thought concerning the effect of loan size on loan performance. One school believes that large loans are less likely to default because they tend to be more institutional quality assets with more substantial borrowers and professional management. In contrast, the other school believes that small balance loans may default less because the asset is often the borrower's sole livelihood and the loan is more likely to be recourse.

Fitch IBCA's results, reported in Exhibit 8, show that loans with balances of less than \$500,000 or more than \$5 million default less than loans with midrange balances. Loans with balances greater than \$10 million had an average annual default rate of 1.97%, which is less than half the default rate for a loan with a balance of \$500,000-\$1 million. This finding appears to show that both schools of thought may be correct.

The RTC/thrift loans had only slightly different results, in that the smallest loan balance category had the lowest default rate of all loan balance categories, with the overall trend being the same as the total portfolio. This may be attributable to the relatively small number of large balance loans in the RTC/thrift pools and the very large number of small balance loans. The private label/conduit results were very similar to the total pool results.

The loss severity rates, reported in Exhibit 9, appear to mirror the trend for defaults — very small loans and large loans have the lowest losses. Loans that

are greater than \$10 million have the lowest loss severity at 34.2%, which may be a result of the higher collateral quality expected in large loans. None of the results were statistically significant.

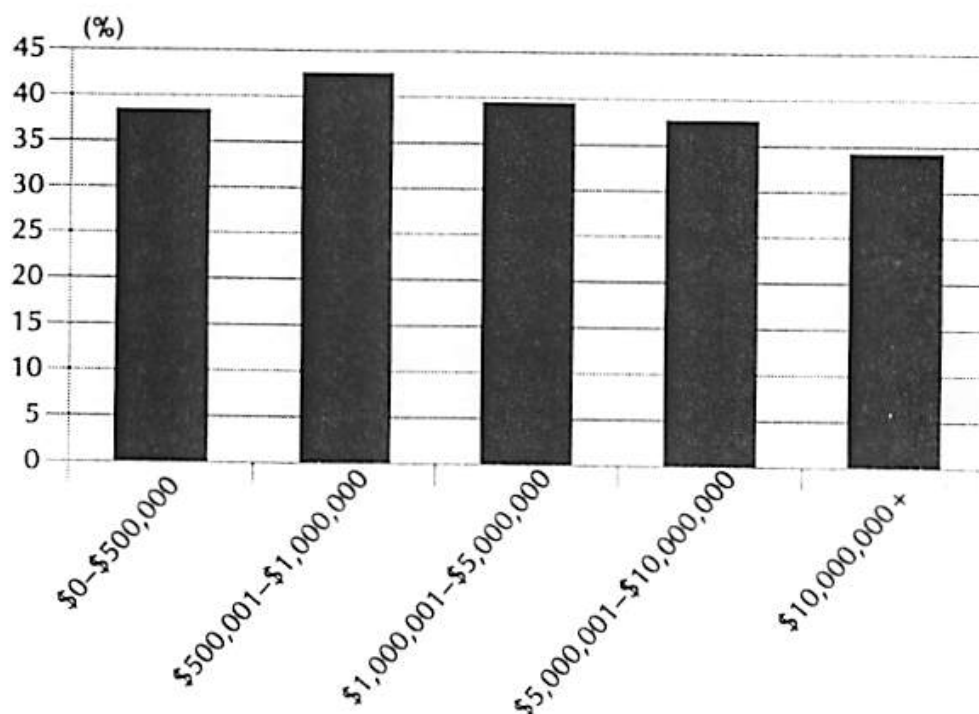
The RTC/thrift loans had a generally discernible trend that was similar to the overall portfolio, with none of the results being statistically significant. The private label/conduit loans also had the lowest loss rates for the smallest and largest loan balance categories, mirroring the overall portfolio.

## INTEREST RATE TYPE

Fitch IBCA found the average annual default rate for floating- and fixed-rate loans to be 5.4% and 3.5%, respectively, with the results being statistically significant. This finding shows that fluctuations in interest rates can have a significant impact on property level stresses and, hence, on default rates, even during a period of relatively stable and low interest rates. Fitch IBCA would expect there to be an even greater discrepancy between fixed- and floating-rate loan default rates in high interest rate environments.

The RTC/thrift loans had very similar results compared to the overall pool, with floating- and fixed-rate loans having average annual default rates of 5.2% and 3.7%, respectively. The results were statistically significant.

*Exhibit 9: Loss by Loan Size*



The private label/conduit loans had an average annual default rate of 1.8% for floating-rate loans and 2.0% for fixed-rate loans. The lack of any difference between the two rates may be due to the relatively small number of default observations. The results were not statistically significant.

Loss severities were also influenced by interest rate type, with floating-rate loans having an average loss severity of 42.1%, while fixed-rate loans had an average loss of 35.1%, both of which are statistically significant. The RTC/thrift loans had nearly identical results as the overall pool, with the findings having statistical significance. The private label/conduit subpool floating-rate loans had an average loss of 23%, while the fixed-rate loans had an average loss of 27.4%, with no statistical significance.

## LOAN TYPE

Fitch IBCA found that fully amortizing loans default less than half as often as balloon loans, on an average annual basis. The fully amortizing loan default rate is 2.6%, while the balloon loan default rate is 6.0%.

An additional part of Fitch IBCA's analysis involved studying balloon loans separately to determine if they defaulted on a principal and interest (P&I) payment during the term of the loan or upon refinancing the outstanding balance at the balloon maturity date. The balloon date is crucial because it imposes an additional stress on the property, refinance risk. A loan at its balloon maturity might, though the collateral is generating enough cash flow to cover its principal and interest payments, default because the balloon balance cannot be refinanced. Fitch IBCA has addressed refinance risk by using property-specific stressed refinance constants, which anticipate capital constrained lending environments. Fitch IBCA also incents issuers to structure transactions with full servicer flexibility, which allows loans to be extended or modified.

Fitch IBCA found that approximately 59% of the defaulted balloon loans defaulted at the balloon date. This result, during a period of abundant capital availability, illustrates the problem posed by refinance risk and the need for offsetting that risk through the use of refinance constants and servicer flexibility.

The RTC/thrift loans show a similar result to the overall pool but with even higher balloon loan defaults, at 6.6% annually.

The private label/conduit loans had a similar trend, but the difference between balloon and fully amortizing loans is less. None of the results were statistically significant.

Fully amortizing loans had a substantially greater average loss than balloon loans, at 42.0% and 34.7%, respectively. This is surprising but consistent with Fitch IBCA's previous research. Part of the explanation may be that borrowers with fully amortizing loans wait longer to exercise their default options in trying to work through problems than borrowers with balloon mortgages.

Balloon loans that defaulted on a P&I payment incurred average losses of 49.5%, while balloon loans that defaulted at the maturity date had losses of approximately 18%. A possible explanation is that balloon loans with marginally positive coverage (and lower loss severity) tend to default at maturity, when the borrower cannot obtain full replacement financing, rather than during the P&I period.

The RTC/thrift loans had identical results to the overall pool. The private label/conduit loans had an average loss for fully amortizing loans of 34.0% and 25.5% for balloon loans.

## LOSS SEVERITY AND COMPONENTS OF LOSS

Fitch IBCA's sample contains 3,134 defaulted loans, of which 795 loans have incurred realized losses to date. The types of loan resolutions included note sales, restructurings, liquidations, discounted payoffs, and obtaining deeds in lieu of foreclosure. The losses are attributable to property protection expenses, interest advanced, and decreases in the value of the property, net of any property income. A loss was defined as the loan balance at default (balance at securitization less amortization) plus advanced interest and property protection expenses less property sales proceeds and property income. Loss severity was calculated as a percentage of the loan balance at securitization rather than at default to reflect Fitch IBCA's credit enhancement levels at securitization.

During the period 1991 through mid-1997, the average loss rate was 39.1% of the loan balance at securitization. The loss attributable to a decrease in property value was 35.8%, advanced interest was 10.5%, and property protection expenses were 7.7%, for a total loss of 54%. Partial amortization on the loans and property income reduced the loss back down to 39.1%.

## LOSS SEVERITY BY TRANSACTION

Exhibit 10 shows defaults by transaction. Of the 33 transactions included in the database, 17 have suffered losses from loans resolved during the period 1991 to July 1997 (see Exhibit 11). Both the average loss rate for each transaction, which ranged from 0%–69.5%, and the range of individual loan loss severities varied considerably among the transactions. Fitch IBCA's analysis shows that the average loss rates experienced in RTC 1992-C4 and RTC 1992-CHF are comparatively lower, at 24.6% and 30.5%, respectively, than the average losses experienced in any of the RTC multifamily transactions, FDIC 1994-C1, or SASCO 1993-C1, which ranged from 43.5%–69.5%. The comparatively lower average loss rates are due to the very large number of small losses in RTC 1992-C4 and RTC 1992-CHF. While the loss rates for the sample ranged widely from less than 1%–219% of loan balance at securitization, the average loss severity was skewed downward by the large number of these small losses.





## SERVICER FLEXIBILITY

Fitch IBCA tested for the possible effects of servicer flexibility on default rates and loss severity. Each of the 33 transactions in Fitch IBCA's sample was reviewed for the ability of the servicer to extend the loan, forgive interest and/or principal, change the interest rate, or modify any other substantive loan term. Each of the transactions was then categorized into one of five servicer buckets, which ranged from limited or no flexibility to full servicer flexibility. The results were not conclusive, but showed a slight trend toward lower losses when the servicer had more flexibility. None of the results was statistically significant. The lack of a more defined trend and statistically significant results is due to the lack of loss data on those transactions that have the most servicer flexibility — private label/conduit transactions. As these deals season and realize more losses, the results of any analysis will become clearer.

## MULTIPLE REGRESSION/MULTIVARIATE ANALYSES

The discussion thus far utilized a single-variable approach to analyzing default rates and loss severity. This univariate approach takes certain loan and collateral characteristics — DSCR, property type, and loan size, among others — and examines each characteristic/variable separately for its effect on default and loss, while multiple linear regression examines these characteristics, in combinations, to measure their effect on default and loss.

In trying to examine this interaction, Fitch IBCA has utilized two types of multivariate analysis: multiple linear regression analysis and principal component analysis. The latter tries different combinations of the variables until a combination is found that describes the most variation exhibited by the data.

Fitch IBCA's multiple linear regression used most of the loan and collateral characteristics as variables and was able to achieve a relatively high explanatory power (R squared) of 49%. However, because the data from the RTC/thrift transactions had a significant amount of missing information, and the equation required complete data, the sample size was limited to 134 loans. This limited the predictive power of the equation. Also, because the equation had approximately 30 variables, the coefficients became unwieldy and were not meaningful. Lastly, many of the variables were correlated with each other and further degraded the predictive power of the equation. As a result of these issues, particularly the very small sample size, this type of analysis is not very useful currently, but, as losses with complete information become available, multiple linear regression will become a more powerful predictor of loan performance.

Fitch IBCA's principal component analysis consisted of grouping different combinations of variables and using them to explain the variance in the data. This type of analysis does not provide coefficients with which to quantify the

effect of a variable on default or loss; rather, it tells which combination of variables will give the best explanation of the data. Fitch IBCA's principal component analysis identified DSCR, geographic location, loan size, loan type, property type, servicer flexibility, and interest rate type as the optimal set of variables to use. The combined explanatory power of these variables was a very high 65.9%.

## CONCLUSIONS

The default and loss rates presented in this chapter reflect the performance of only those loans studied over the period 1991 to mid-1997, and future average rates will likely be substantially different. Nevertheless, these findings provide meaningful insight into the variables that affect commercial loan performance.

Fitch IBCA found that loans with low DSCRs, floating-rate loans, and balloon loans all had relatively higher average annual rates of default. Fitch IBCA currently assumes higher default frequencies for loans with lower DSCRs, and calculates DSCR for floating-rate loans based on stressed interest rates. Fitch IBCA addresses the risks of balloon loans by calculating DSCRs based on hypothetical refinance rates, which consider loan and property type. In addition, Fitch IBCA views full servicer flexibility to be critical in offsetting balloon risk. Small loans and large loans tended to default less than medium-size loans. However, smaller loans did not show lower average losses than larger loans. Currently, Fitch IBCA does not adjust default frequency or loss severity based on loan size, but will continue to study the influence of loan size on loan performance.

The average loss severity of 39.1% of the original loan balance is high considering the benign economic environment over the past several years. This loss rate is likely to worsen if economic factors become more adverse. While the underwriting standards on today's conduit pools are better, many loans in conduit pools are secured by properties that are of approximately the same physical collateral quality as those in the RTC/thrift transactions. Consequently, similar loss rates could result. Of course, the overall performance of conduit transactions will be influenced significantly by economic conditions at the time the loans mature, especially since conduit loans tend to have grouped maturities.