

CMBS Credit Migrations

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I. Introduction

Certain kinds of CMBS have displayed greater credit volatility – both negative and positive – than others. In particular, CMBS from specific types of deals and from certain vintages have exhibited exceptionally high credit volatility compared to others. Likewise, CMBS that carry ratings from certain combinations of rating agencies have experienced markedly differing degrees of credit volatility.

Among the major CMBS deal types, single-borrower lease-backed deals have displayed much higher degrees of adverse credit volatility than other deal types. Resecuritized and seasoned loan deals have exhibited the greatest measures of favorable credit volatility.

Compared to other vintages of CMBS deals, the vintages from 1993 and 1994 have shown higher levels of both positive and negative credit volatility.

Along the ratings dimension, credit volatility varies by rating agency, as well as by particular combinations of rating agencies. CMBS rated by more than one rating agency have tended to show lower levels of both positive and negative credit volatility. In fact, CMBS rated by all three rating agencies showed the lowest degree of negative credit volatility. The Moody's+Fitch combination showed nearly as low a level of negative credit volatility, but the Fitch+S&P, and the S&P+Moody's combinations displayed greater volatility to the negative side. For CMBS rated by only one agency, those rated by Fitch showed the least negative volatility and the greatest positive volatility.

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II. Background on the Study

In January 2002, we published a report titled *ABS Credit Migrations*.¹ This study is an extension and expansion of that original effort. In *ABS Credit Migrations*, we studied the frequency of adverse credit events affecting U.S. ABS deals issued from 1990 through mid-year 2001.

In this report, we examine the frequency of credit events affecting CMBS issued from 1992 through mid-year 2002. We excluded all tranches from deals done by the GSEs as well as all other unrated tranches. In addition, we excluded 172 tranches from deals done by the Resolution Trust Corporation (RTC) during the period 1992 through 1995. Because of their unusual characteristics, we believe that the RTC deals were exceptional and would bias the study's results. Deals like the ones from the RTC are absent from today's CMBS landscape. Overall, our final sample universe consisted of 6,019 rated CMBS tranches representing nearly \$362 billion of aggregate initial issuance.

Our main sources for identifying and classifying CMBS were the databases maintained by Commercial Mortgage Alert and by Trepp & Co. In addition, we received listings of all CMBS rating actions from each of the three rating agencies.

In contrast to our earlier ABS study, this CMBS report examines both positive credit migrations as well as negative ones. However, our main orientation was toward identifying signals that a portfolio manager could use in order to avoid unpleasant surprises or to identify situations in which to seek incremental return as compensation for credit volatility. That focus is consonant with the ordinary view of the credit process as an exercise in trying to stay out of trouble.

Also in contrast to our earlier study, this report examines credit migrations at the tranche or security level rather than at the deal level. The data for examining credit migrations at the tranche level was readily available for CMBS, while it was not for ABS.

We considered credit migrations of varying degrees of impact or severity. For adverse credit migrations, we defined four categories: (1) defaults of investment grade securities, (2) near defaults of investment grade securities, (3) major downgrades, and (4) minor downgrades.

- We classified a CMBS as a "default" if it initially carried an investment grade rating (Baa3/BBB- or better from at least one rating agency) and if it (i) experienced an actual payment default, (ii) experienced such severe collateral deterioration such that eventual payment default is inevitable, (iii) was the subject of a forced or coerced exchange, or (iv) was downgraded to default status.²
- We classified as "near default" any CMBS that was investment-grade at issuance subsequently fell to Caa/CCC or worse, and which did not otherwise qualify for "default" classification.
- We defined the "major downgrade" category as including CMBS that would not qualify for the "default" or "near default" categories and that (i) were downgraded from Aaa or AAA, (ii) were downgraded from investment grade (Baa3/BBB- or higher) to speculative grade (Ba1/BB+ or lower), or (iii) experienced cumulative downgrades of more than six notches. The "major downgrade" category also included each CMBS that failed to qualify for the "default" or "near default" categories solely because it initially had been rated speculative grade. In effect, within our four-category scheme, the "worst"

¹ *ABS Credit Migrations*, Nomura Fixed Income Research (9 January 2002, updated 5 March 2002).

² We treated each of the following as a downgrade to default status: (i) a downgrade by Moody's to Ca or lower, (ii) a downgrade by Standard & Poor's to D, or (iii) a downgrade by Fitch to DDD or lower.

classification that an initially speculative-grade CMBS could receive was "major downgrade."

- We defined the "minor downgrade" category as including all CMBS that experienced a downgrade and that did not otherwise qualify for any of the other categories.

By creating different categories of adverse credit events, we were able to produce results that can be used by market participants with varying degrees of tolerance for such events. For example, a portfolio manager might care only about defaults if he has a high tolerance for risk or is not required to mark his positions to market (*i.e.*, he can buy and hold). A different portfolio manager – one operating under a restriction that requires him to sell securities whose ratings drop below a certain level – might have much less tolerance and might care about minor downgrades and anything worse. The four categories cover nearly the whole range of adverse credit events. The categories do not capture negative press coverage affecting deals or watchlistings that do not result in downgrades.

Separately, away from our four-category classification scheme, we examined CMBS defaults more broadly, including both defaults of securities that initially carried investment-grade ratings and defaults of those that initially had been rated speculative grade. There were eleven defaults of CMBS that initially were rated investment grade and another 41 defaults of CMBS that started out with speculative grade ratings. By combining the two groups, we formed a more useful sample than the eleven alone provide.

For positive credit migrations, we considered two categories: (1) CMBS that experienced cumulative upgrades of more than six notches and (2) CMBS that experienced cumulative upgrades of six notches or less. Only CMBS that carried initial ratings below Aaa/AAA from at least one rating agency had the potential for positive credit migrations. That universe consisted of 4,448 tranches. We expected to observe a reasonably high incidence of moderate upgrades on such tranches because of the de-leveraging that most CMBS transactions experience as they age. By creating a dividing line at six notches, we hoped to differentiate credit migrations attributable to exceptional or unforeseen causes from those more likely resulting from normal and expected de-leveraging.

We measured the frequency of credit events in terms of both the number of tranches and on a dollar-weighted basis. We found that both approaches produced nearly the same rank ordering of results.

III. Results

A. Credit Migrations by Deal Type

Chart 1a below summarizes the frequencies that we calculated for the four categories of adverse credit events for different types of CMBS transactions. Each bar in the chart shows the "cumulative" frequency of credit events equal to or worse than a specified level of seriousness for a given deal type. Thus, each row includes all the rows in front of it. The front row of the chart shows the frequency of "defaults" (as defined above) for each deal type. The frequency shown by each bar in the second row is the combined frequency of defaults and near defaults. The third row shows the combined frequency for major downgrades, near defaults, and defaults. The back row shows the combined frequency for minor downgrades, major downgrades, near defaults, and defaults.

We have plotted the charts in terms of cumulative frequency because we believe this measure will be most useful to investors. Aversion to adverse credit events naturally can vary among investors. However, any single investor's aversion to such events must rise with increasing seriousness of such events. Accordingly, a hypothetical investor might have a high tolerance for major and minor downgrades but might be highly averse to near defaults. The investor's aversion to defaults would be at least as strong as his aversion to near defaults. Accordingly, that investor could use the second row of Chart 1a to see the cumulative frequency of events equal to or worse than near defaults.

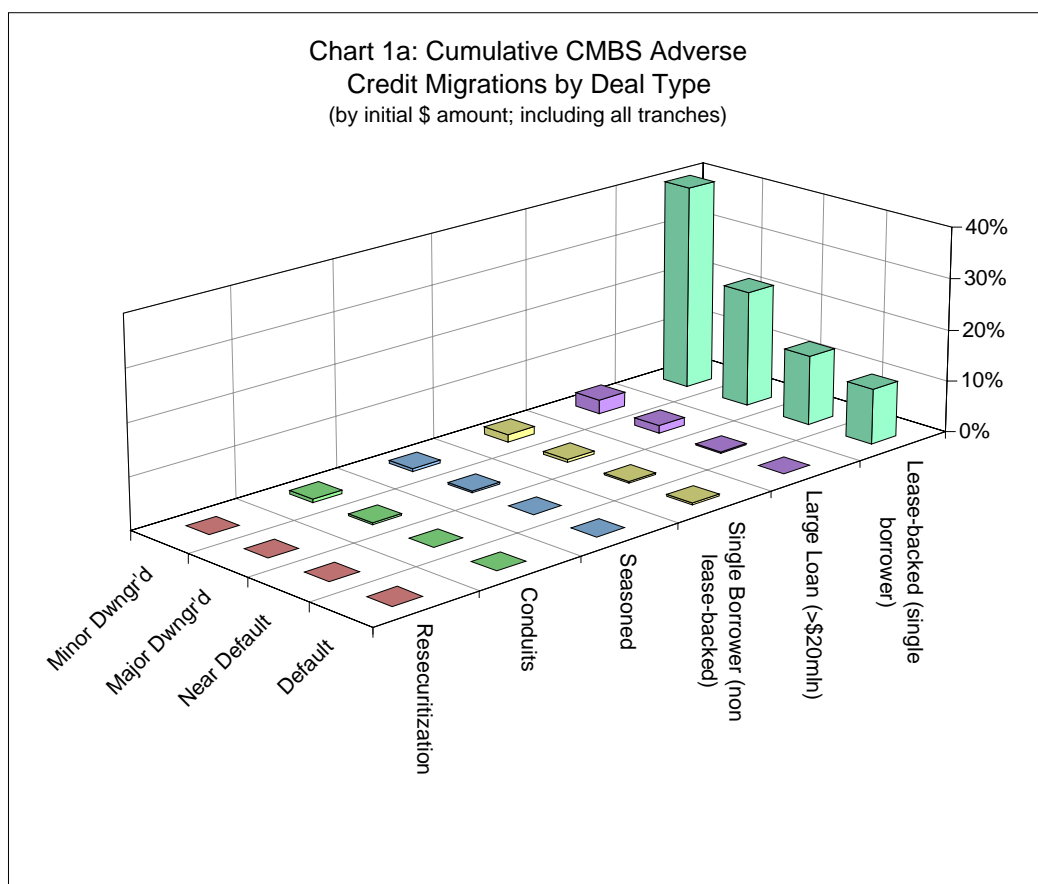


Table 1 below shows the data used to generated Chart 1a, as well as the corresponding data in terms of the number of tranches:

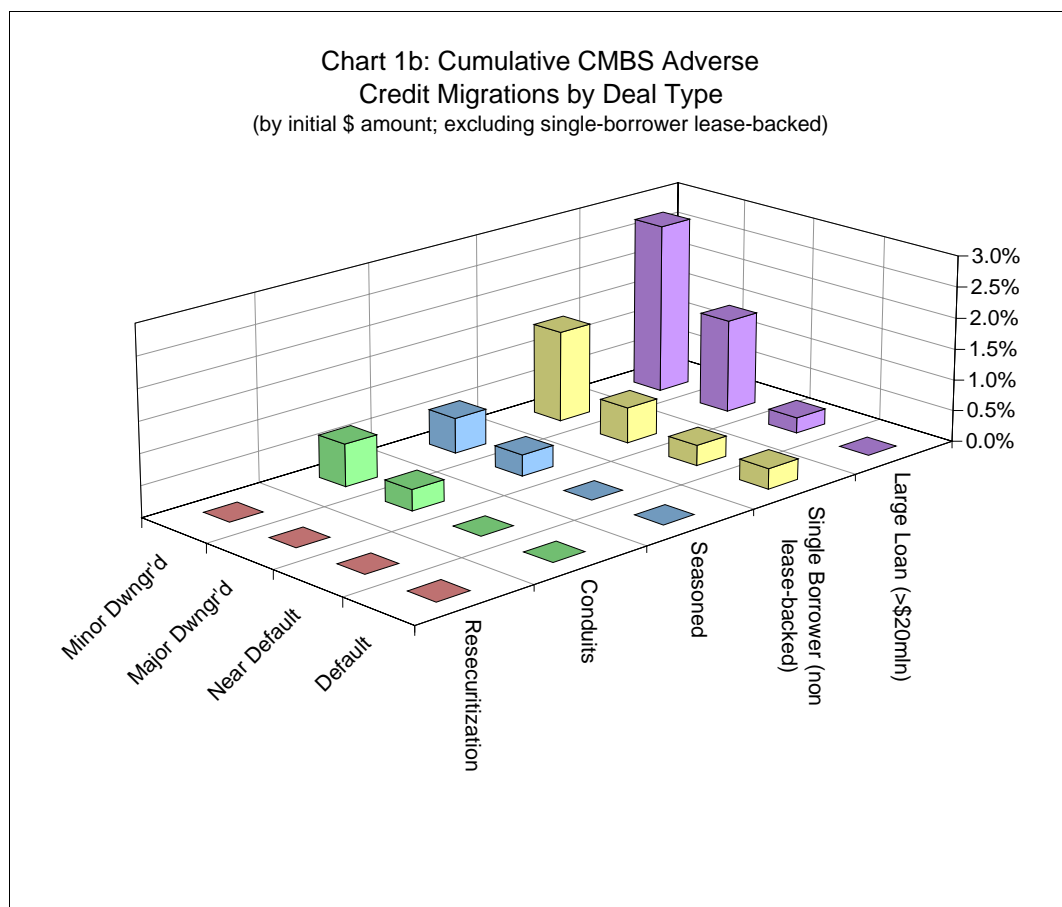
TYPE	Defaults		Near Defaults (and worse)		Major Downgrades (and worse)		Minor Downgrades (and worse)		Total Population	
	\$	#	\$	#	\$	#	\$	#	\$	#
Resecuritization	0	0	0	0	0	0	0	0	5,480	77
Conduit	0	0	0	0	828	62	1,662	96	245,341	3,900
Seasoned	0	0	0	0	161	7	265	12	47,072	889
Single Borrower (non-lease-backed)	145	4	145	4	253	7	648	17	44,264	877
Large Loan (>\$20mln)	0	0	37	2	224	9	410	15	14,944	210
Lease-backed (single borrower)	519	7	651	12	1,086	21	1,926	32	4,816	66
Total	664	11	834	18	2,552	106	4,911	172	361,918	6,019

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category. Each category includes the values in all the other columns to its left.

The results displayed in Chart 1a and Table 1 indicate that adverse credit migrations occur with substantially higher frequency in CMBS from certain types of deals than in CMBS from others. CMBS from single-borrower lease-backed deals have performed poorly compared to CMBS from other types of deals.

CMBS from "large loan" deals displayed the next highest frequency of adverse credit migrations after single-borrower lease-backed deals. This is readily visible on Chart 1b, which shows the same data

as plotted on Chart 1a except that the data for single-borrower lease-backed deals is removed and the scale is expanded.



Significantly, no investment-grade CMBS from conduit deals reached default or near default status. The conduit category includes 3,900 tranches representing roughly \$245 billion. Given the large sample size, the totally spotless track record of the conduit sector is notably impressive.

In our ABS credit migration study, we observed substantial variability in the frequency of adverse credit migrations across ABS asset classes. Manufactured housing stood out as the worst performing asset class, but there was still substantial variation among the other asset classes. The situation appears to be somewhat different in the CMBS arena. Apart from the notably poor performance of the single-borrower lease-backed cohort, the other CMBS deal types show less variation in their adverse credit migration experience than was present among the ABS asset classes. Although the ABS arena is dominated by consumer receivables, the universe of collateral backing ABS is more heterogeneous overall than the collateral backing CMBS. Therefore, the lesser degree of observed performance variability within the CMBS area is understandable.

Examining CMBS defaults more expansively, we further considered the frequency of defaults regardless of whether a defaulting CMBS initially had carried an investment grade or a speculative grade rating. In this analysis, CMBS that carried initial ratings in the speculative-grade range *could* count as defaults. Within this framework, the results were equally compelling. Based both on the number of defaulting securities and on dollar-weightings, CMBS from single-borrower lease-backed deals still showed the greatest frequency of defaults. CMBS from large loan deals were a distant second in total default frequency.

The results are displayed in Chart 2 and in Table 2. The front row shows the frequency of defaults on a dollar-weighted basis while the back row shows frequencies in terms of the number of tranches that experienced defaults.

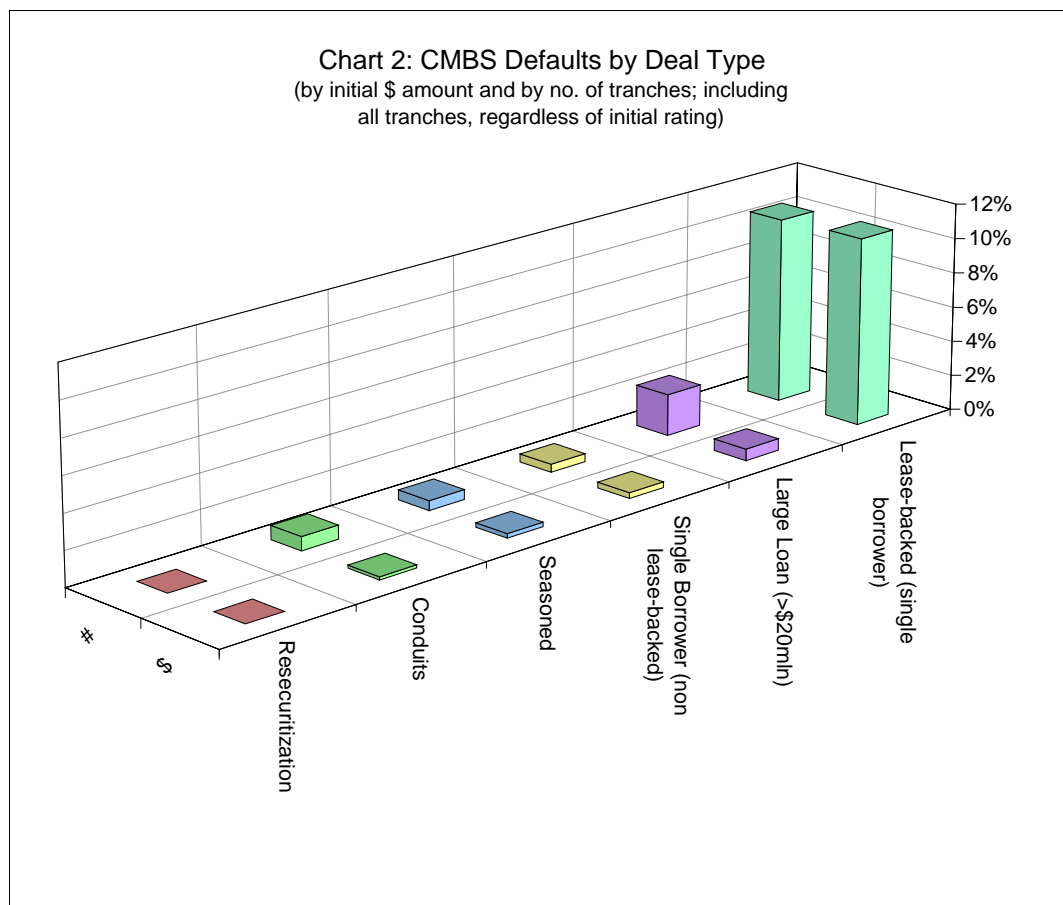


Table 2: CMBS Defaults by Deal Type
(including all tranches, regardless of initial rating)

Type	Defaults		Total Population	
	\$	#	\$	#
Resecuritization	0	0	5,480	77
Conduit	411	31	245,341	3,900
Seasoned	118	5	47,072	889
Single Borrower (non-lease-backed)	145	4	44,264	877
Large Loan (>\$20m/in)	99	5	14,944	210
Lease-backed (single borrower)	519	7	4,816	66
Total	1,292	52	361,918	6,019

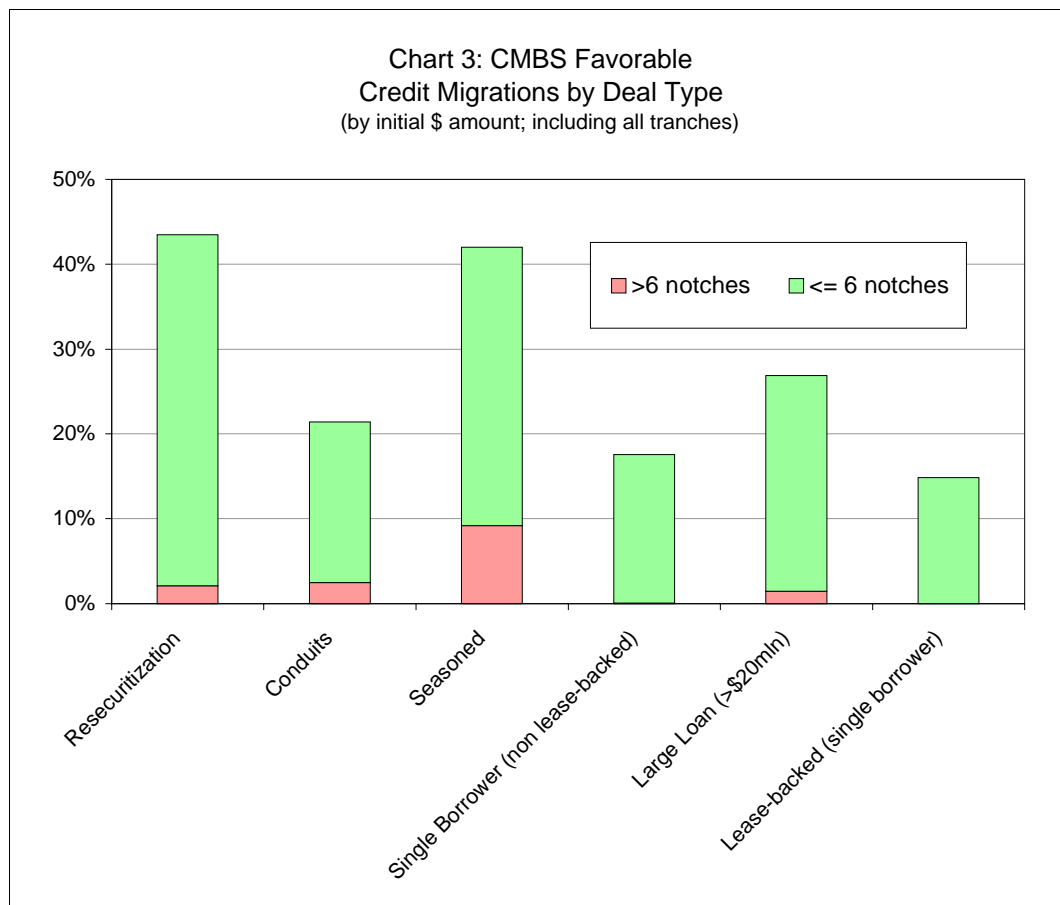
Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

A possible explanation for the overall weak performance of the single-borrower lease-backed cohort is that such deals are not "real" CMBS transactions, but rather corporate debt masquerading as CMBS. In fact, a significant portion of all "defaults" and "near defaults" (within our four-category classification scheme) were directly attributable to Kmart's bankruptcy.³

³ The mortgage loans underlying single borrower lease-backed deals are very different from those that back other types of CMBS. For example, in a typical lease-backed mortgage loan – such as one in the Kmart deals – the value of the underlying property and its projected cash flows are not significant constraints on the amount of the loan. Such a loan can have a loan-to-value ratio of 100% and a debt-service-coverage ratio of 1.0. The evaluation of such a loan is based entirely on the borrower's credit quality at the time the loan is made. In contrast, the underwriting of a regular commercial mortgage loan is based the value of the related property and its projected cash flows. A regular commercial mortgage loan secured by a retail property would likely have an LTV of roughly 80% and a DSCR in the range of 1.25 to 1.40. In essence, a lease-backed mortgage loan is simply secured corporate debt, not true mortgage debt underwritten on the basis of real estate.

On the other side of the coin, we also considered positive credit migrations. We viewed any rating upgrade to constitute a positive credit migration. In addition, we separately examined the frequency with which CMBS experienced aggregate upgrades of more than six "notches" from a single rating agency.⁴

Compared to adverse credit migrations, favorable migrations were somewhat more evenly spread among CMBS from the different types of transactions. CMBS from resecuritizations and those from deals backed by seasoned loans showed a somewhat higher proportion of positive credit migrations than CMBS from other types of deals. These results are detailed in Chart 3 and Table 3.



⁴ We calculated notches based on the following scales:

Notch	S&P	Moody's	Fitch	Notch	S&P	Moody's	Fitch
1	AAA	Aaa	AAA	13	BB-	Ba3	BB-
2	AA+	Aa1	AA+	14	B+	B1	B+
3	AA	Aa2	AA	15	B	B2	B
4	AA-	Aa3	AA-	16	B-	B3	B-
5	A+	A1	A+	17	CCC+	Caa1	CCC+
6	A	A2	A	18	CCC	Caa2	CCC
7	A-	A3	A-	19	CCC-	Caa3	CCC-
8	BBB+	Baa1	BBB+	20	CC	Ca	CC
9	BBB	Baa2	BBB	21	C	C	C
10	BBB-	Baa3	BBB-	22	D		DDD
11	BB+	Ba1	BB+	23			DD
12	BB	Ba2	BB	24			D

In calculating frequencies of positive credit migrations, we excluded from the denominator CMBS that could not be upgraded because all their initial ratings were Aaa/AAA.

TYPE	≤6 notches		>6 notches		Total Population	
	\$	#	\$	#	\$	#
Resecuritization	1,315	18	66	2	3,178	64
Conduit	12,998	352	1,679	39	68,570	2,896
Seasoned	6,996	219	1,958	66	21,317	638
Single Borrower (non-lease-backed)	4,250	119	17	1	24,302	663
Large Loan (>\$20mln)	1,173	35	66	2	4,608	132
Lease-backed (single borrower)	578	3	0	0	3,893	55
Total	27,310	746	3,786	110	125,867	4,448

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

As we expected, the overall frequency of positive credit migrations was much higher than the frequency of negative ones. As explored more fully below, we believe that a substantial majority of the positive credit migrations were due to the natural de-leveraging that occurred in many deals as they aged. In addition, the period covered by the study was mostly a period of economic expansion and rising real estate values, which, *ceteris paribus*, ought to increase the proportion of favorable credit migrations relative to adverse ones. As indicated by Chart 3, the high frequency of favorable credit migrations extends to CMBS from all types of deals, but somewhat more so to CMBS from resecuritization and deals backed by seasoned loans. A likely cause is that such deals ultimately are backed by older loans (on average), which had less call protection. Consequently, prepayments and de-leveraging would be faster for such deals.

B. Credit Migrations by Vintage

Certain vintages of CMBS displayed disproportionately high frequencies of adverse credit migrations. The 1994 vintage had the weakest performance and the 1993 vintage had the second weakest performance. Chart 4 and Table 4 depict these results. Chart 4 should be read in the same manner as Chart 1a. The four-category classification scheme is the same (see page 2) and each row includes all the rows in front of it (*i.e.*, the bars for each category reflect the cumulative frequency of adverse migrations in that category as well as those in all worse categories).

Chart 4: Cumulative CMBS Adverse Credit Migrations by Vintage
(by initial \$ amount; including all tranches)

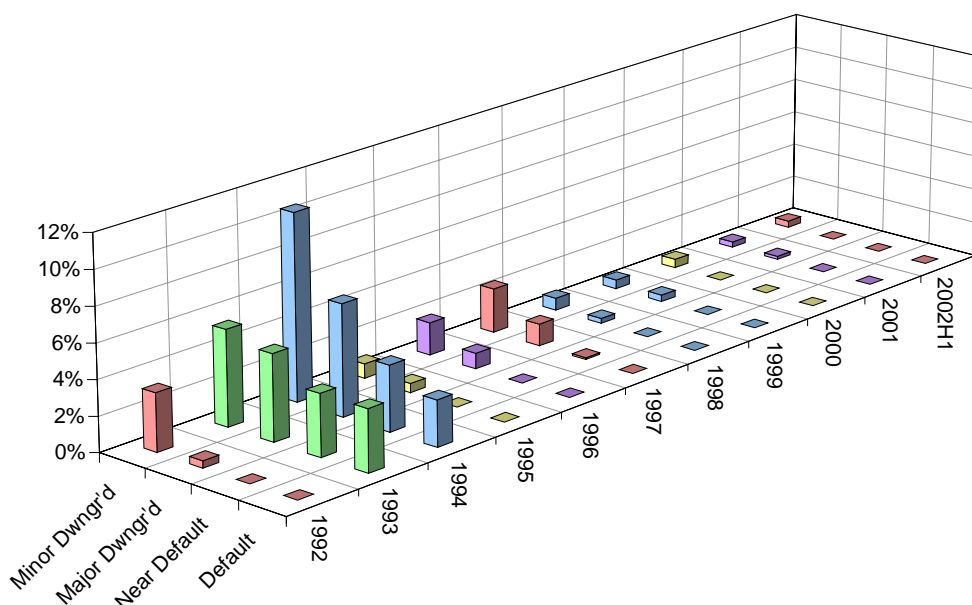


Table 4: Cumulative CMBS Adverse Credit Migration by Vintage
(including all tranches)

Vintage	Defaults		Near Defaults (and worse)		Major Downgrades (and worse)		Minor Downgrades (and worse)		Total Population	
	\$	#	\$	#	\$	#	\$	#	\$	#
1992	0	0	0	0	43	1	360	4	10,998	112
1993	350	6	350	6	487	12	540	14	9,964	238
1994	314	5	446	10	759	18	1,276	25	12,003	281
1995	0	0	0	0	68	9	108	14	13,117	336
1996	0	0	0	0	205	8	425	16	22,791	464
1997	0	0	37	2	449	23	902	36	35,564	549
1998	0	0	0	0	204	19	495	31	70,745	677
1999	0	0	0	0	208	7	281	13	54,203	770
2000	0	0	0	0	4	3	236	8	46,960	842
2001	0	0	0	0	124	6	211	7	65,402	1,294
2002 (½ year)	0	0	0	0	0	0	76	4	20,169	456
Total	664	11	834	18	2,552	106	4,911	172	361,918	6,019

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category. Each category includes the values in all the other columns to its left.

Viewed together, Charts 1a and 4 strongly suggest that CMBS from single-borrower lease deals from 1994 represent a particularly weak – and arguably disappointing – subset of the CMBS universe. They also suggest that the practice of creating single-borrower lease-backed CMBS that are simply disguised corporate bonds fell into disfavor shortly after 1995. From that point forward, lease-backed loans sometimes still appeared in CMBS, but only in modest proportions and combined with regular (*i.e.*, traditionally underwritten) commercial mortgage loans.

As above, we also considered CMBS defaults by vintage more expansively, including defaults of securities that had started their lives with speculative-grade ratings. By that reckoning, 1993 and 1994 are virtually tied as the worst vintage year. Certain other vintages (1995 through 1998) show notable numbers of defaulting tranches but low dollar volumes. This is likely attributable to defaults of small subordinate tranches from those vintages. Chart 5 and Table 5 display the results and should be read in the same manner as Chart 2. Including speculative-grade securities within the scope of analysis reveals that subordinate tranches of deals from most vintages earlier than 1999 have experienced some measure of defaults. The default ratios appear quite reasonable — indeed if they were much lower it arguably would suggest that CMBS subordinate tranches had been systematically over-enhanced.

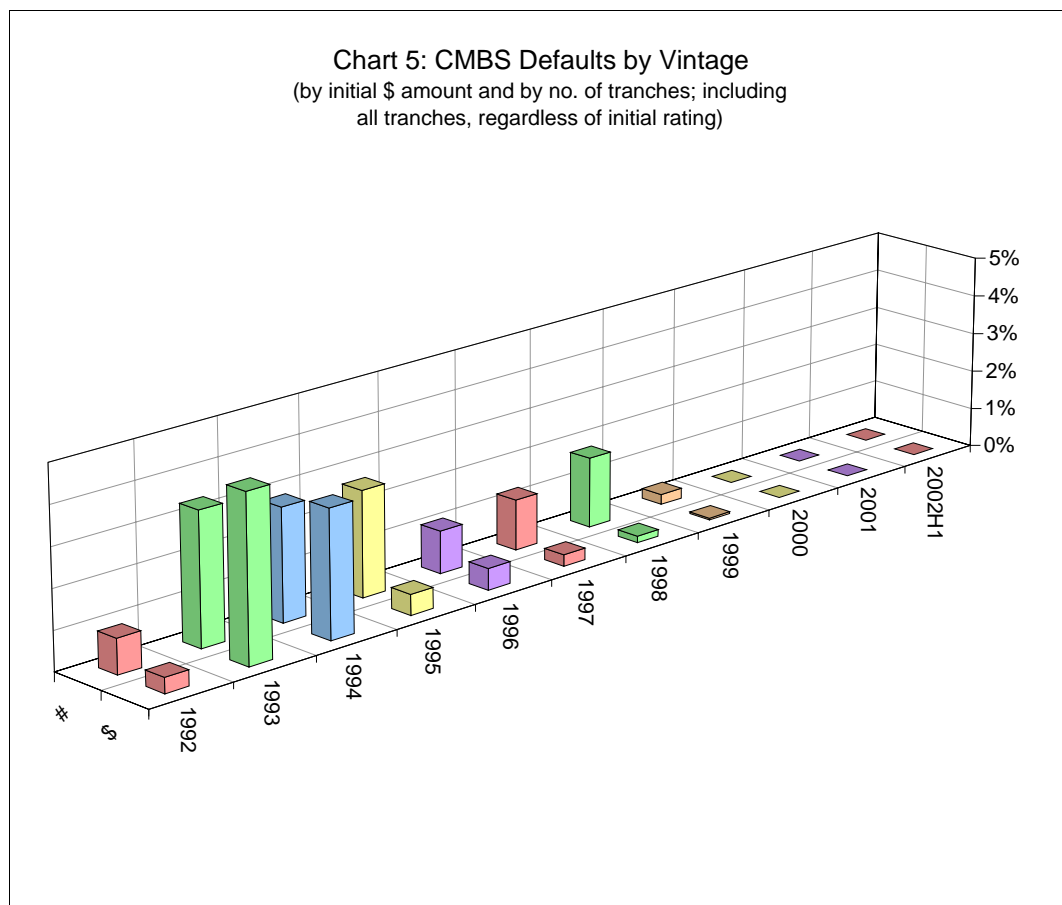


Table 5: CMBS Defaults by Vintage Type (including all tranches, regardless of initial rating)				
Vintage	Defaults		Total Population	
	\$	#	\$	#
1992	43	1	10,998	112
1993	420	8	9,964	238
1994	388	8	12,003	281
1995	68	9	13,117	336
1996	125	5	22,791	464
1997	103	7	35,564	549
1998	121	12	70,745	677
1999	24	2	54,203	770
2000	0	0	46,960	842
2001	0	0	65,402	1,294
2002 (½ year)	0	0	20,169	456
Total	1,292	52	361,918	6,019

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

Positive credit migrations were more evenly spread across vintages than adverse ones. However, we observed that positive credit migrations generally were higher in vintages from 1998 and earlier. In most of those vintages, around 40% of the CMBS (by initial dollar amount) experienced some kind of positive credit migration. Younger vintages displayed lower frequencies of upgrades. We believe that this reflects the greater de-leveraging that the older vintages have experienced, as well as the somewhat slower growth of rents and real estate values in recent years. Chart 6 and Table 6 detail the findings.

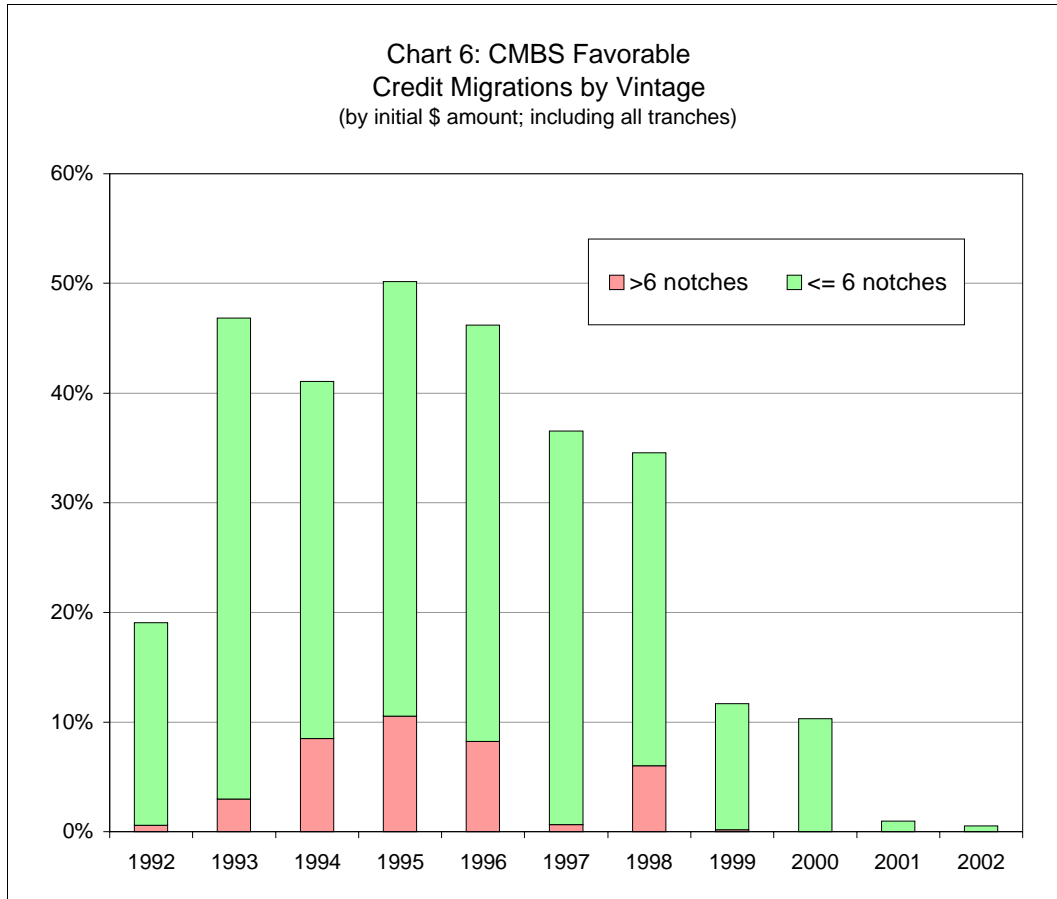


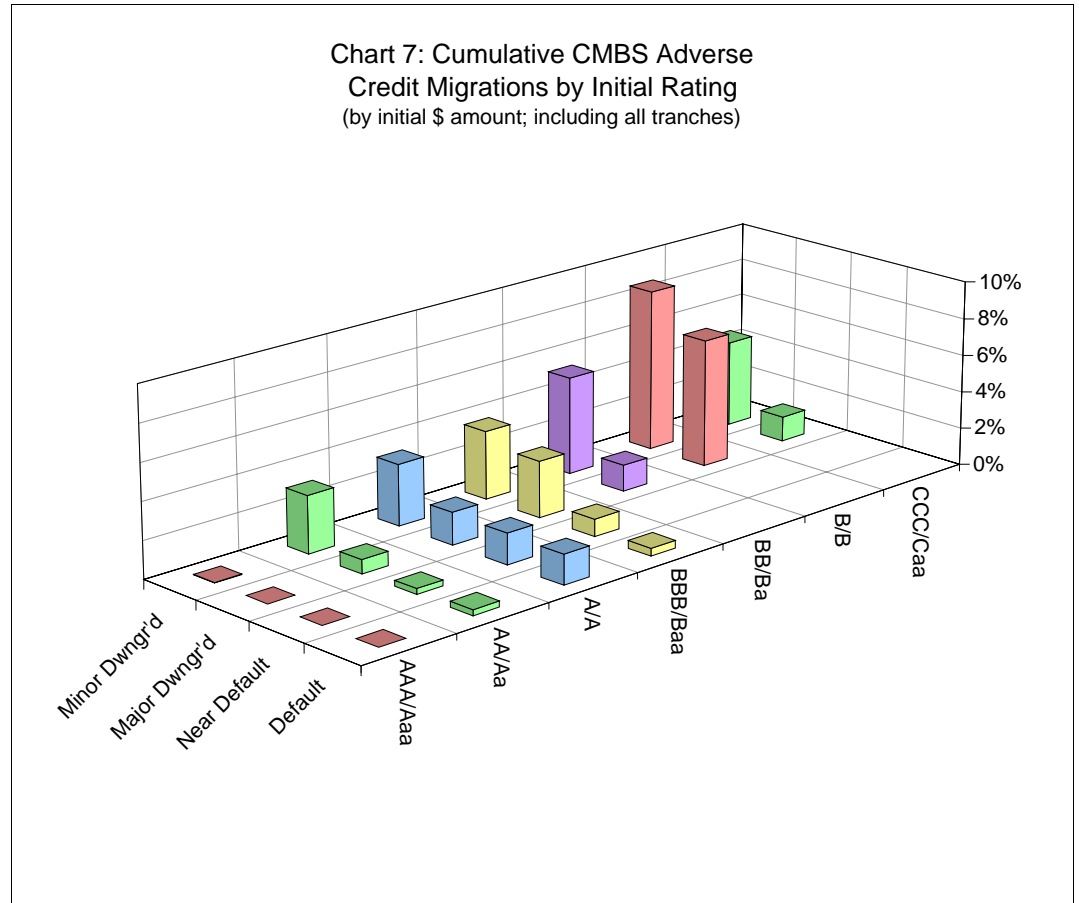
Table 6: CMBS Favorable Credit Migrations by Vintage
(including all tranches)

Vintage	≤6 notches		>6 notches		Total Population	
	\$	#	\$	#	\$	#
1992	1,340	22	43	1	7,259	86
1993	2,629	69	178	9	5,990	179
1994	2,223	83	580	23	6,825	221
1995	2,387	111	636	25	6,028	232
1996	3,727	160	808	25	9,811	329
1997	4,677	118	84	5	13,029	385
1998	6,787	92	1,427	21	23,762	498
1999	1,999	52	30	1	17,349	575
2000	1,342	35	0	0	13,005	654
2001	172	3	0	0	17,826	951
2002 (½ year)	26	1	0	0	4,983	338
Total	27,310	746	3,786	110	125,867	4,448

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

C. Credit Migrations by Initial Rating

We examined the frequency of credit migrations for CMBS having different initial ratings. We observed that CMBS initially rated speculative grade exhibited higher frequencies of adverse credit migrations than those initially rated investment grade. More generally, we observed a slight inverse relationship between the initial CMBS ratings and the frequency of adverse migrations. The results are shown in Chart 7 and Table 7. Chart 7 should be read in the same manner as Charts 1a and 4.



Note: As described on page 2, CMBS that initially carried speculative-grade ratings cannot be classified as "near default" or "default" within our four-category classification scheme.

The overall results shown in Chart 7 and Table 7 agreed with our *ex ante* expectations. All other things being equal, lower-rated securities ought to be more sensitive to deteriorating conditions than more highly rated ones. However, the single-A-rated cohort showed an unexpectedly high frequency of defaults and near defaults. If the single-A frequencies were roughly one quarter of their actual level, the disturbing hump in the chart would disappear. The anomaly probably is not meaningful given the very low absolute number of defaults (see Table 7).

Table 7: Cumulative CMBS Adverse Credit Migration by Initial Rating (including all tranches)											
Initial Rating	Defaults		Near Defaults (and worse)		Major Downgrades (and worse)		Minor Downgrades (and worse)		Total Population		
	\$	#	\$	#	\$	#	\$	#	\$	#	
AAA/Aaa	0	0	0	0	16	1	77	2	241,427	1,644	
AA/Aa	116	3	116	3	283	6	1,159	16	37,774	794	
A/A	428	5	446	7	467	8	882	20	26,807	797	
BBB/Baa	119	3	272	8	884	32	1,071	40	29,224	1,300	
BB/Ba					226	12	838	38	16,023	744	
B/B					663	46	838	53	9,655	683	
CCC/Caa					14	1	47	3	1,008	57	
Total	664	11	834	18	2,552	106	4,911	172	361,918	6,019	

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category. Each category includes the values in all the other columns to its left.

Considering defaults in the broader sense (*i.e.*, counting defaults of all CMBS regardless of whether they initially carried speculative grade or investment grade ratings), we observed a similar frequency spike for the single-A rating cohort. Chart 8 and Table 8 display the results; Chart 8 should be read in the same manner as Charts 2 and 5.

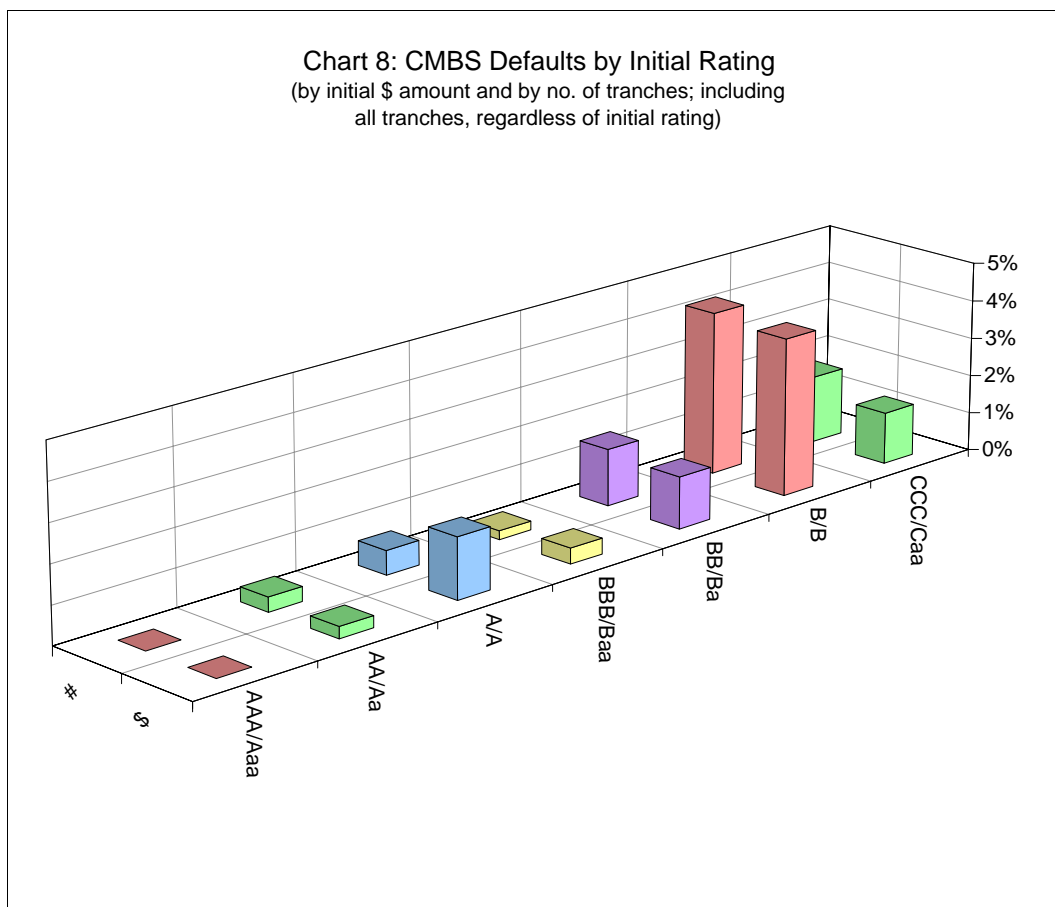
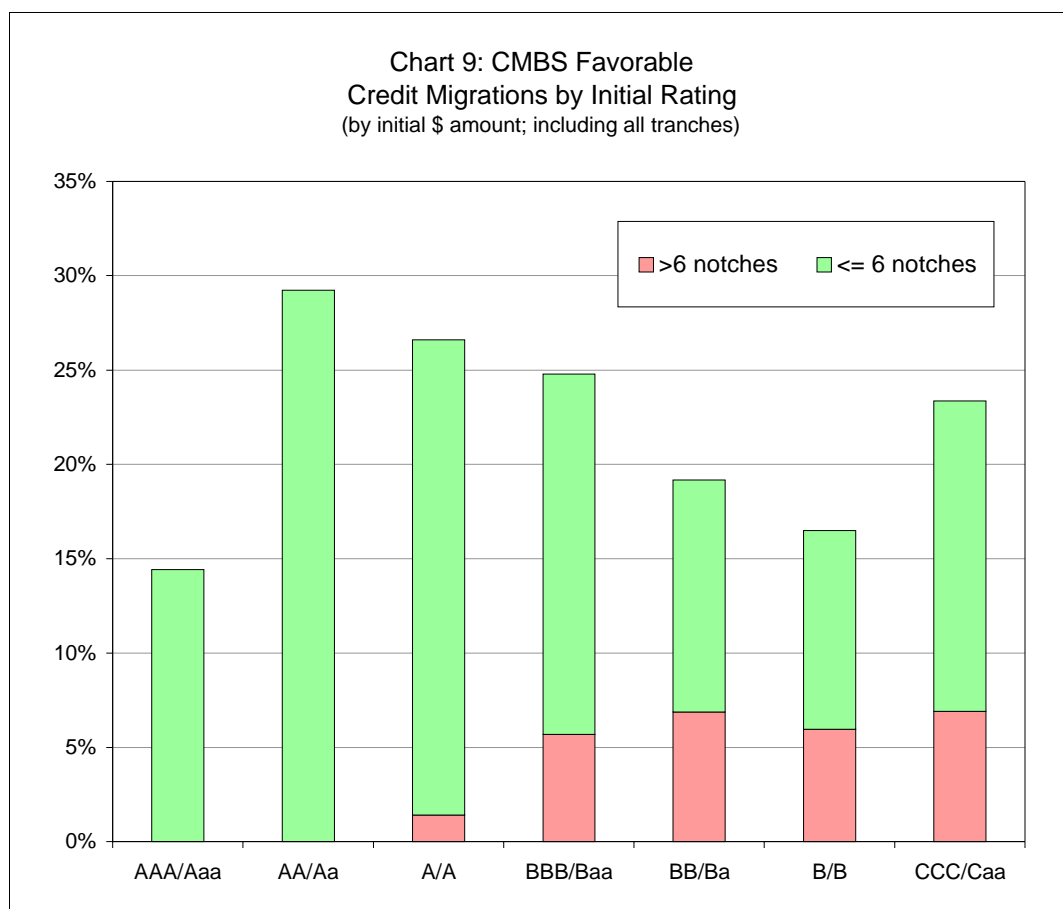


Table 8: CMBS Defaults by Initial Rating (including all tranches, regardless of initial rating)				
Initial Rating	Defaults		Total Population	
	\$	#	\$	#
AAA/Aaa	0	0	241,427	1,644
AA/Aa	116	3	37,774	794
A/A	428	5	26,807	797
BBB/Baa	119	3	29,224	1,300
BB/Ba	217	11	16,023	744
B/B	397	29	9,655	683
CCC/Caa	14	1	1,008	57
Total	1,292	52	361,918	6,019

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

Turning to positive credit migrations, higher-rated CMBS showed a slightly higher propensity to be upgraded than lower-rated CMBS. This may be due to the disproportionate impact of de-leveraging at higher layers within the capital structure of a CMBS deal. On the other hand, in the case of lower-rated tranches, a notable proportion of all positive credit migrations were large (*i.e.*, more than six notches). These results are detailed in Chart 9 and Table 9.



Initial Rating	≤6 notches		>6 notches		Total Population	
	\$	#	\$	#	\$	#
AAA/Aaa	775	12			5,376	73
AA/Aa	11,042	236			37,774	794
A/A	6,754	181	380	6	26,807	797
BBB/Baa	5,586	186	1,660	59	29,224	1,300
BB/Ba	1,972	73	1,101	28	16,023	744
B/B	1,016	54	575	15	9,655	683
CCC/Caa	166	4	70	2	1,008	57
Total	27,310	746	3,786	110	125,867	4,448

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

In Chart 9 and Table 9, split-rated securities are included in the cohort of their highest ratings. Thus, the 73 CMBS that compose the AAA/Aaa cohort are all split rated.

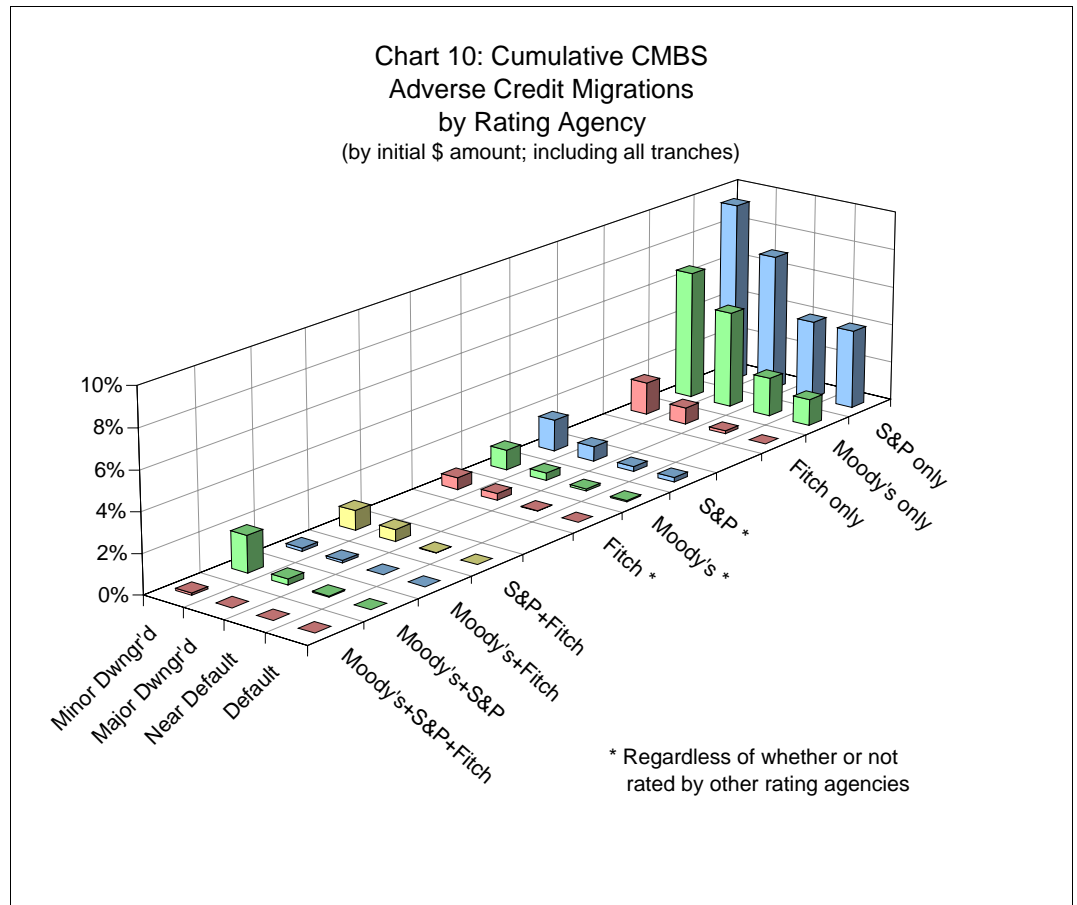
D. Credit Migrations by Rating Agency

As in our ABS credit migrations study, we examined the frequency of adverse credit migrations based on which rating agencies had rated the securities. The results we observed for CMBS were quite different than the ones we observed for ABS. Chart 10 and Table 10 detail the results. Chart 10 should be read in the same manner as Charts 1a, 4, and 7.

As in the earlier charts, each bar on Chart 10 shows the "cumulative" frequency of credit events equal to or worse than a specified level of seriousness and each row includes all the rows in front of it. However, unlike the earlier charts, each category along the depth of the chart relates to securities that carried ratings from a particular rating agency or combination of rating agencies.⁵

Interpreting the results shown in the following charts and tables *vis-à-vis* "rating agency performance" is a tricky proposition. Nevertheless, we have tried to tackle it. Readers are cautioned to refer to part IV, which describes some of the problems and limitations in doing so.

⁵ A security's classification (e.g., "default," "near default," "major downgrade," or "minor downgrade") usually depended on actions taken by the rating agencies. In cases where rating agencies took differing actions, or where other criteria for the "default" classification were present, we used the most severe classification applicable. Thus, for example, if one rating agency downgraded a CMBS from investment grade to speculative grade (*i.e.*, a "major downgrade") the security would count as a major downgrade for all other rating agencies that initially had rated the it, regardless of whether any of them ever had downgraded it.



1. CMBS Rated by Two or More Rating Agencies Had Lower Frequencies of Adverse Credit Events than Those Rated by Only One Rating Agency

Consider the first grouping of bars in Chart 10. That grouping relates to CMBS that carried ratings from more than one rating agency. The first category in that grouping (Moody's+S&P+Fitch) relates to CMBS that carried ratings from all three rating agencies. The second category (Moody's+S&P) relates to CMBS that carried ratings from Moody's and Standard & Poor's, but not from Fitch. Now consider the third grouping of bars. Each category in that grouping relates to CMBS that carried ratings from only a single rating agency. The overall difference in the height of the bars between the first grouping and the third grouping reveals that CMBS rated by two or more rating agencies tended to have lower frequencies of adverse credit migrations.

2. CMBS Rated by All Three Rating Agencies Had the Lowest Frequency of Adverse Credit Migrations

CMBS that carried ratings from all three rating agencies displayed the greatest resistance to adverse credit migrations. This is reflected by the relative shortness of the bars in the first category of the first grouping (M+S+F). This result was different than the result of our ABS credit migration study. In that study, ABS deals rated by Moody's and S&P (but not by Fitch) displayed lower frequencies of adverse credit migrations than deals rated by all three rating agencies. In that study, the presence of a Fitch rating was correlated with weaker performance. Quite the opposite appears here; the addition of a Fitch rating to the Moody's+S&P combination produces a significant improvement in performance (*i.e.*, lower frequencies of adverse credit migrations).

3. For CMBS Rated by Two Rating Agencies, the Moody's-Fitch Combination Had the Lowest Frequency of Adverse Credit Migrations

CMBS that carried ratings from both Moody's and Fitch, but not S&P, showed nearly as strong performance as those rated by all three agencies. CMBS rated by Moody's and S&P (but not Fitch) displayed the highest frequency of minor downgrades, while CMBS rated by S&P and Fitch displayed the highest frequency of major downgrades. All the combinations that include Fitch (*i.e.*, M+S+F, M+F, S+F) displayed lower frequencies of downgrades than the one combination (*i.e.*, M+S) that did not.

4. For CMBS Rated by Only One Rating Agency, Those Rated by Fitch Had the Lowest Frequency of Adverse Credit Migrations

As shown by the heights of the bars in the third grouping, among CMBS that had ratings from only one rating agency, those rated by Fitch had the lowest frequencies of adverse credit migrations. This result agrees somewhat with the results of the ABS credit migration study. CMBS that carried only S&P ratings had the highest frequency of adverse credit migrations. This too agrees with the results of the ABS study.

Based on the findings above, it seems fair to conclude that Fitch ratings are significantly more valuable as predictors of credit quality in the CMBS context than they were in the ABS setting. In fact, based on the results shown in Chart 10, Fitch ratings arguably outperformed ratings from both of the other rating agencies.

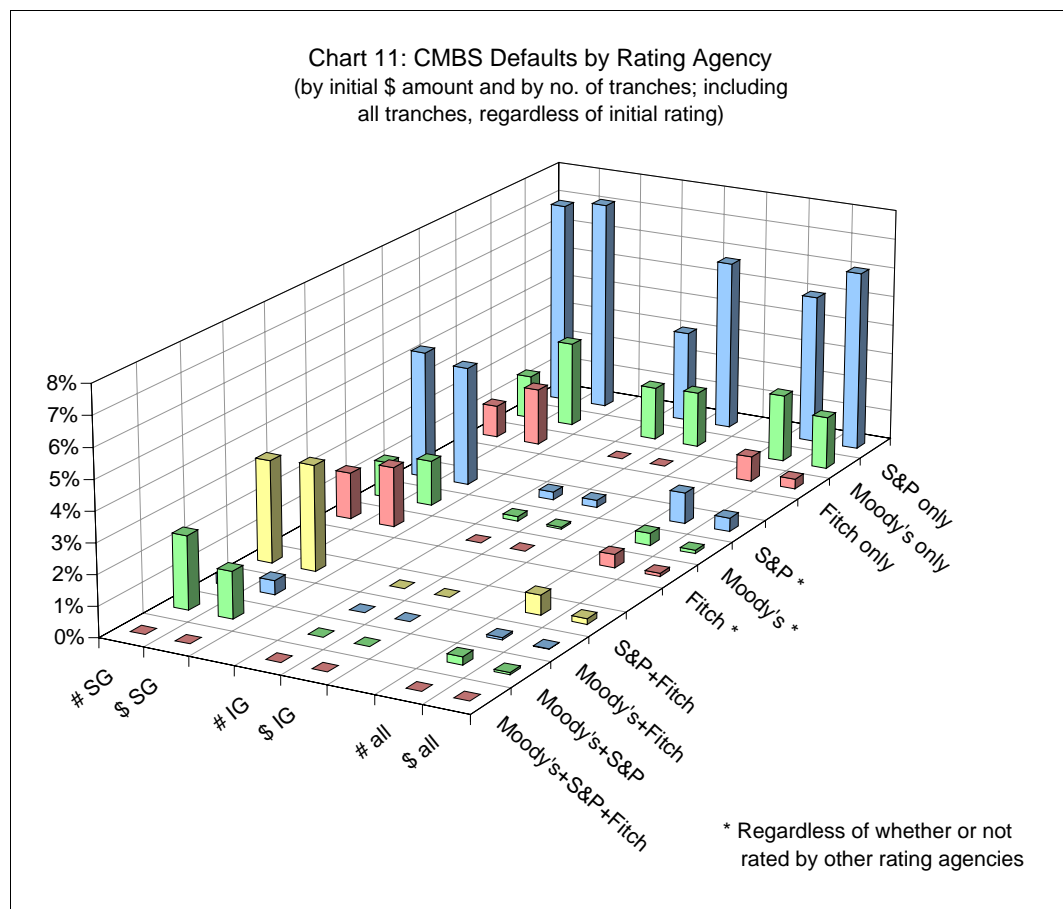
Table 10: Cumulative CMBS Adverse Credit Migration by Rating Agency
(including all tranches)

Rating Agency	Defaults		Near Defaults (and worse)		Major Downgrades (and worse)		Minor Downgrades (and worse)		Total Population	
	\$	#	\$	#	\$	#	\$	#	\$	#
Moody's+S&P+Fitch	0	0	0	0	0	0	48	2	41,113	371
Moody's+S&P	0	0	41	1	234	11	1,450	31	78,631	1,123
Moody's+Fitch	0	0	0	0	120	9	160	10	100,283	1,355
S&P+Fitch	0	0	18	2	530	22	882	37	89,791	1,386
Fitch*	0	0	63	5	894	50	1,570	77	260,027	4,064
Moody's*	145	4	253	6	880	38	2,358	68	230,615	3,245
S&P*	519	7	577	10	1,661	60	3,571	109	222,206	3,316
Fitch only	0	0	45	3	245	19	481	28	28,841	952
Moody's only	145	4	211	5	526	18	700	25	10,588	396
S&P only	519	7	519	7	898	27	1,191	39	12,671	436

*Regardless of whether rated by other rating agencies
Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category. Each category includes the values in all the other columns to its left.

We also considered the frequency of CMBS defaults, without regard to bonds' initial ratings. As in Charts 2, 5, and 8, defaults within the scope of Chart 11 include both defaults of CMBS that initially carried investment-grade ratings as well as defaults of those that initially carried speculative-grade ratings. The front two rows show the frequency of CMBS defaults by rating agency on both a dollar-weighted basis (\$ all) and by number of tranches (# all). Table 11a shows the data behind the first two rows of Chart 11.

The middle two rows of Chart 11 break out the results for CMBS that initially carried investment-grade ratings (\$ IG and # IG). The last two rows of Chart 11 break out the results for CMBS that initially carried speculative grade ratings (\$ SG and # SG). Table 11b shows the data corresponding to the middle two rows and the last two rows on Chart 11.



The results shown in the front two rows of Chart 11 generally support the conclusions drawn from Chart 10. CMBS with multiple ratings had lower frequencies of defaults than CMBS that had only one rating. Likewise, CMBS that carried ratings from all three rating agencies showed the strongest performance. However, in contrast to Chart 10, the perspective of Chart 11 depicts virtually a dead heat between Moody's and Fitch in the race to be the rating agency whose ratings are associated with the lowest frequencies of default. Fitch had lower frequencies of investment-grade defaults while Moody's had lower frequencies of speculative-grade defaults.

Table 11a: CMBS Defaults by Rating Agency (including all tranches, regardless of initial rating)				
Rating Agency	Defaults		Total Population	
	\$	#	\$	#
Moody's+S&P+Fitch	0	0	41,113	371
Moody's+S&P	55	3	78,631	1,123
Moody's+Fitch	14	1	100,283	1,355
S&P+Fitch	166	9	89,791	1,386
Fitch *	275	18	260,027	4,064
Moody's *	256	13	230,615	3,245
S&P *	995	34	222,206	3,316
Fitch only	96	8	28,841	952
Moody's only	187	9	10,588	396
S&P only	774	22	12,671	436

*Regardless of whether rated by other rating agencies
 Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

Table 11b: CMBS Defaults by Rating Agency
(including all tranches, regardless of initial rating)

Rating Agency	Investment Grade Defaults		Speculative Grade Defaults		IG Population		SG Population	
	\$	#	\$	#	\$	#	\$	#
Moody's+S&P+Fitch	0	0	0	0	40,878	359	235	12
Moody's+S&P	0	0	55	3	76,318	926	2,314	197
Moody's+Fitch	0	0	14	1	96,382	1,139	3,901	216
S&P+Fitch	0	0	166	9	84,890	1,128	4,901	258
Fitch *	0	0	275	18	242,182	3,160	17,845	904
Moody's *	145	4	111	9	221,324	2,646	9,292	599
S&P *	519	7	477	27	211,071	2,640	11,135	676
Fitch only	0	0	96	8	20,032	534	8,808	418
Moody's only	145	4	42	5	7,746	222	2,842	174
S&P only	519	7	255	15	8,986	227	3,686	209

*Regardless of whether rated by other rating agencies

Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category.

Columns labeled "#" indicate the number of tranches in a category.

On the other hand, the strong performance of Moody's ratings shown in Chart 11 ignores the dimension of time. As shown in Chart 12 and Table 12, Moody's was less active than the other rating agencies in rating CMBS before 1997. Accordingly, fewer of Moody's ratings have been outstanding for as long as the ratings from the other rating agencies and, therefore, the Moody's ratings have not been as severely tested by aging. As shown in Chart 5 above, virtually all CMBS defaults come from 1998 and earlier vintages. The timing factor suggests that the signaling power of Moody's ratings may not be as strong as indicated by Chart 11.

Chart 12: Rating Agency Market CMBS Shares
(by initial \$ amount: investment grade and speculative grade tranches)

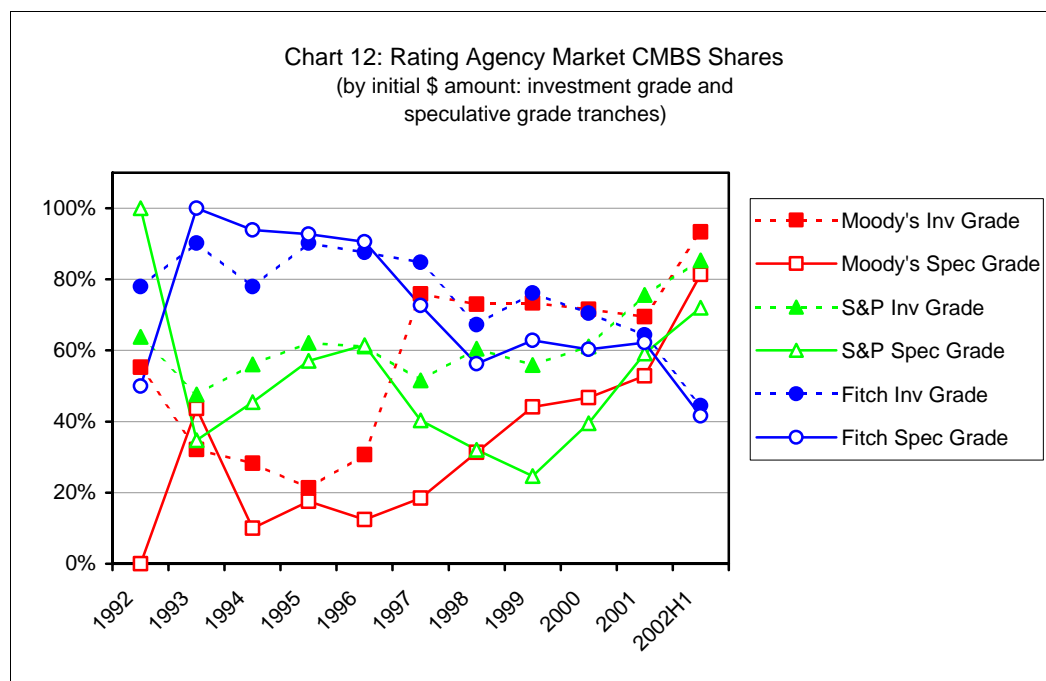
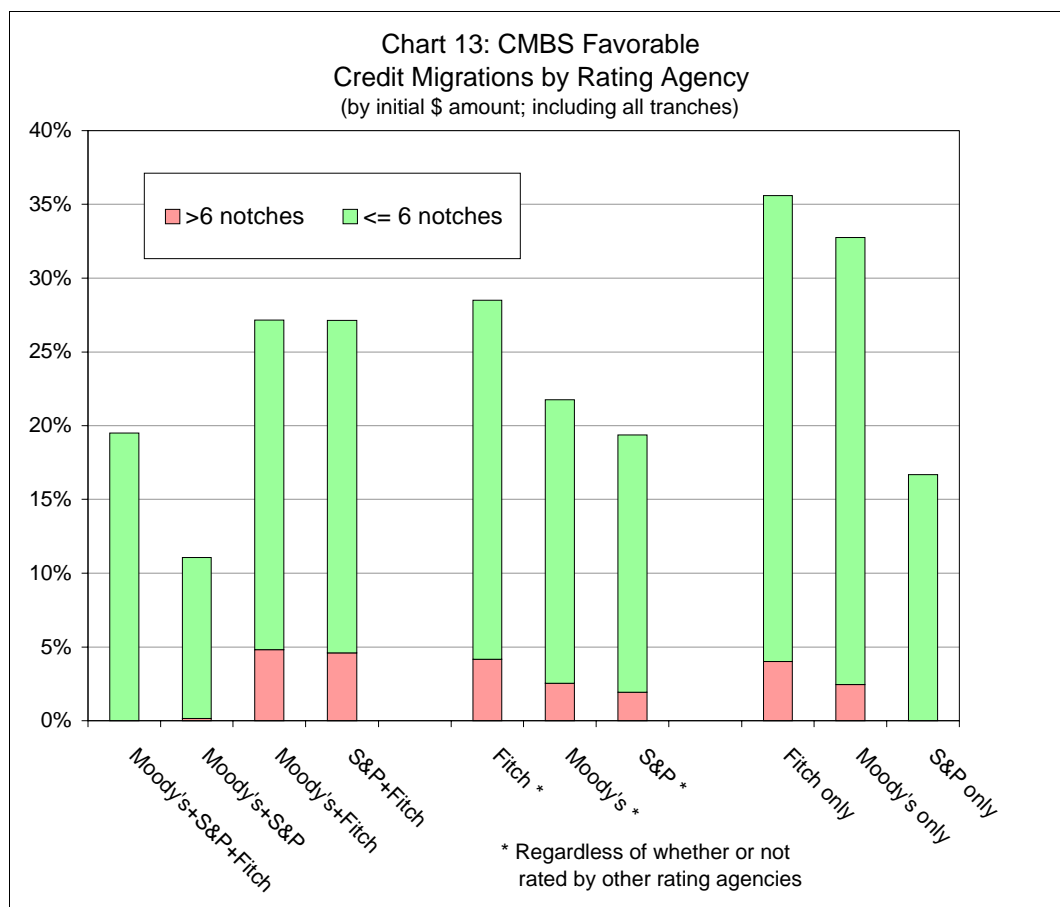


Chart 11 also suggests an alternative interpretation of the data: Speculative-grade CMBS that *did not* carry ratings from S&P arguably display unreasonably *low* frequencies of default. From the perspective of a CMBS bondholder, the notion of unreasonably low default frequencies may seem absurd. However, from the perspective of the debt capital markets as a whole, professionals reasonably may desire that ratings reflect similar measures of credit risk (as proven by actual credit performance over time) across sectors. Speculative-grade CMBS rated by Moody's and Fitch have much lower default frequencies than comparably rated corporate debt. This performance difference may be detrimental to the efforts of fixed income strategists who rely on ratings as indicators of credit risk in seeking to optimize sector allocations. Such a strategist might unintentionally underweight CMBS relative to corporate bonds.

Table 12: Dollar Volume of CMBS Rating Activity by Rating Agency
(including all tranches; by initial dollar amount)

Year	Investment Grade CMBS				Speculative Grade CMBS			
	Moody's	S&P	Fitch	Total	Moody's	S&P	Fitch	Total
1992	6,026	6,959	8,502	10,911	0	87	43	87
1993	3,000	4,446	8,425	9,341	272	216	623	623
1994	3,153	6,249	8,691	11,148	86	389	802	855
1995	2,482	7,222	10,494	11,636	259	846	1,373	1,482
1996	6,327	12,589	18,057	20,611	270	1,341	1,974	2,180
1997	24,322	16,526	27,199	32,067	647	1,410	2,541	3,497
1998	46,468	38,523	42,782	63,640	2,226	2,279	3,999	7,105
1999	36,631	27,927	38,031	49,952	1,877	1,048	2,670	4,252
2000	31,635	27,027	31,190	44,226	1,278	1,080	1,649	2,734
2001	43,537	47,388	40,350	62,688	1,434	1,604	1,689	2,714
2002H1	17,743	16,215	8,460	19,010	943	834	482	1,159

Turning from negative credit migrations to positive ones, CMBS that carried ratings from Fitch were more likely than others to experience favorable credit migrations. It is not clear whether this is because Fitch was more conservative in assigning initial ratings or because it was more aggressive in upgrading securities after they had been outstanding for some time. Chart 13 and Table 13 show the results.



Initial Rating	≤6 notches		>6 notches		Total Population	
	\$	#	\$	#	\$	#
Moody's+S&P+Fitch	1,386	28	0	0	7,106	203
Moody's+S&P	2,423	49	36	2	22,260	789
Moody's+Fitch	6,948	157	1,502	34	31,112	940
S&P+Fitch	6,154	215	1,253	37	27,279	968
Fitch *	20,777	591	3,556	101	85,417	2,919
Moody's *	13,152	286	1,732	43	68,381	2,280
S&P *	11,678	346	1,289	39	66,930	2,352
Fitch only	6,290	191	801	30	19,921	808
Moody's only	2,394	52	194	7	7,904	348
S&P only	1,715	54	0	0	10,286	392

*Regardless of whether rated by other rating agencies
Note: Columns labeled "\$" indicate the initial dollar amount (in millions) of CMBS in the category. Columns labeled "#" indicate the number of tranches in a category.

IV. Problems and Limitations of the Study⁶

The results reported above must be viewed on a landscape of issues that potentially limit their reliability and predictive relevance. From a quantitative standpoint, the issues fall into a number of discernable categories:

- hidden correlations
- missing variables
- non-stationary processes
- sampling bias
- small sample size
- counting errors

This section considers some of the major potential sources of error.

A. Scaling of Defaults

Within the study, all "default" events are counted equally. However, defaults of higher-rated securities are arguably a more serious problem than defaults of lower-rated securities. Only a handful of securities that initially carried investment-grade ratings were classified as defaults.⁷ They are listed, together with their initial ratings, in the following table:

⁶ Some of this section is drawn directly from our *ABS Credit Migrations* report.

⁷ See Appendix A.

Security	Bloomberg Ticker	Initial Rating		
		Moody's	S&P	Fitch
DLJ Mortgage Acceptance Corp.	DLJMA 1993-MF2 A1	Aa2		
DLJ Mortgage Acceptance Corp.	DLJMA 1993-MF2 A2	Aa2		
DLJ Mortgage Acceptance Corp.	DLJMA 1993-MF2 A3	Aa2		
DLJ Mortgage Acceptance Corp.	DLJMA 1993-MF2 B	Baa2		
DR Structured Finance Corp.	DRSLT 1993-K1 A1		A	
DR Structured Finance Corp.	DRSLT 1993-K1 A2		A	
DR Structured Finance Corp.	DRSLT 1994-K1 A1		A	
DR Structured Finance Corp.	DRSLT 1994-K1 A2		A	
DR Structured Finance Corp.	DRSLT 1994-K1 A3		A	
DR Structured Finance Corp.	DRSLT 1994-K2 A1		BBB+	
DR Structured Finance Corp.	DRSLT 1994-K2 A2		BBB+	

From one perspective, the defaults listed above are the worst ones that the CMBS market has experienced. Defaults of investment grade securities reasonably should be viewed as more serious than defaults of speculative grade securities. It is tempting to draw conclusions just from the fact that Fitch rated none of the securities while Moody's and Standard & Poor's each rated some. Similarly, it is tempting to draw conclusions from the fact that the only double-A-rated tranches to have defaulted carried Moody's ratings. However, such conclusions would be suspect because they would neglect the remaining body of the data. On the other hand, the unequal distribution of investment grade defaults serves to highlight a weakness in the study.

A more complicated way to have compiled and analyzed the data would have been to track the initial rating of each defaulted security (or the defaulted security with the highest initial rating in the case of a deal with multiple defaulted securities) and then to apply a "scaling factor" to each deal based on those initial ratings. For example, defaults of securities rated Baa2/BBB, A2/A, Aa2/AA, and Aaa/AAA could be scaled with factors of 1, 5, 10, and 20 (respectively) for purposes of comparing rating agency performance. That is, under such a system, a default of an A2/A-rated security would count as five default events and a default of a Aa2/AA security would count as ten default events. Results tabulated under such a system could be very different than the ones that we have presented here. We did not attempt to use such a system because we cannot say for sure what the scaling factors ought to be. Should the scaling for a triple-A default be five times or one hundred times the scaling of a triple-B default for purposes of measuring rating agency performance? We did not know the answer when we did the ABS credit migration study and we don't know the answer now.

B. Differentiating Real Estate Risk from Corporate Risk

In theory, securitization separates asset risk from company risk. Sometimes, in practice, it does not. In the CMBS context, there are deals that rely primarily on the income producing capacity of the underlying properties and other deals that rely primarily on the corporate credit strength of a single borrower or lessee. Indeed, in the results reported above, CMBS from single-borrower lease-backed deals had the worst frequencies of negative credit migrations. However, CMBS investors are already sensitive to this distinction and make pricing adjustments where appropriate.

C. Equivalence of Rating Scales

The study's classification of credit migrations (*i.e.*, default, near default, major downgrade, minor downgrade, ≤ 6 notches up, or > 6 notches up) relied, in large measure, on rating agency ratings. For purposes of the study we have assumed congruence of the rating scales of all the rating agencies. That is, "Aaa" on Moody's scale reflects the same degree of credit risk as "AAA" on Standard & Poor's scale and "AAA" on the Fitch scale, and so on.

With respect to corporate ratings, there is academic support for the presumption of congruence between Moody's and Standard & Poor's rating scales.⁸ However the same authorities conclude that congruence does not extend to the rating scales of other rating agencies. Those authorities assessed the congruence of rating scales by considering cases of securities with split ratings. Where there were numerous cases of split ratings and one rating agency's ratings were higher than another's most of the time, the researchers concluded that the rating scales of the two agencies were not congruent.

In the structured finance area, there are few instances of split ratings and there have not been academic studies on the question of congruence. However, in connection with the recent controversy over the subject of "notching" by rating agencies, Moody's commissioned National Economic Research Associates (NERA) to conduct an independent study of the structured finance rating practices of the major rating agencies.⁹ When it is released, that study may shed light on the question of whether there is congruence among the rating scales of the rating agencies in the CMBS sector. The NERA study potentially could find that there are varying degrees of congruence in different sub-sectors of the structured finance market. Such a finding would not surprise us.

If the assumption of rating scale congruence were materially wrong, it arguably would introduce a distortion of indeterminate magnitude to the study results. Although the magnitude of the potential distortion is impossible to gauge, its direction is reasonably clear: bonds rated by a rating agency with softer (*i.e.*, easier) standards would show *higher* frequencies of major downgrades and defaults.

D. Differences in Rating Criteria

The rating agencies have embraced divergent criteria in a few key areas affecting CMBS. For example, the rating agencies appear to take different approaches to handling interest shortfalls. Standard & Poor's reacts the most harshly, generally downgrading a security to D if it experiences a shortfall. Moody's and Fitch do not necessarily lower a rating to "default" status in response to a shortfall. For purposes of this study, we recognize interest shortfalls as actual payment defaults.

Conversely, Fitch and Moody's took a hard line on terrorism insurance for commercial properties. Late in the third quarter of 2002 (*i.e.*, after the cut off date of our sample period), each of the two downgraded many CMBS because of inadequate terrorism insurance. S&P did not downgrade any CMBS ratings for that reason. The terrorism insurance downgrades are not included in our sample universe.

E. Instability of Rating Practices over Time

Predictive relevance of the study's findings implicitly relies on the presumption that rating agency practices and standards remain stable over time. There is conflicting evidence on this score. The rating agencies have stated that the risk content of traditional corporate bond ratings is the touchstone against which structured finance ratings are calibrated; with the goal of achieving the same credit risk in a triple-A-rated structured finance security as in a triple-A-rated corporate security. However, a number of market participants have argued strongly that the rating agencies were too conservative in their early structured finance rating efforts. Those market participants point to the strong performance of structured finance securities during the market's formative phase as evidence that the rating agencies were too conservative. The rating agencies have not been deaf to the strength of those arguments. Accordingly, there is some basis for concluding that rating agency standards for rating structured financings could have drifted over time in response to a perceived

⁸ Richard Cantor and Frank Packer, *The Credit Rating Industry*, 19 FRBNY Q. REV. 1, 4 (Summer-Fall 1994); Vivien Beattie and Susan Searle, *Bond Ratings and Inter-Rater Agreement*, J. OF INT'L. SECS. MARKETS 167, 170 (Summer 1992).

⁹ *U.S. Fixed Income Research – Mid-Year Review: Tale of Two Cities*, Nomura Fixed Income Research at 19-21 (July 2002)

excess of caution during the early stages of the market. To the extent that a trend of easier rating standards continues, it suggests that the future would bring higher frequencies of adverse credit events of all types.

F. Monitoring of Ratings

Rating changes can occur only when a rating agency monitors the credit quality of a rated security. Differences in the frequency of changes can be strongly influenced by the degree of diligence that a rating agency exercises in doing so. Differences in migration frequencies for CMBS rated by a just one agency may be largely attributable to differences in monitoring practices. Accordingly, inferences based mainly on those frequency differences may be less reliable.

G. Biased Sample Period

The study covers the period from 1 January 1992 through 30 June 2002 and includes only CMBS issued during that period. Except for the 2001 recession, the entire sample period was a time of economic expansion. This has the effect of biasing the sample and making it difficult to extrapolate what the frequency of adverse credit events would be during harder times. While it is certainly worth hoping that the future will bring us ten fat years for each lean one, it is probably too optimistic to really expect it.

The young age of the CMBS market means that it is currently impossible to study credit migrations over multiple economic cycles (or, arguably, even one full cycle). Years from now such a study may be possible. However, until then, all studies like this one will unavoidably labor under the handicap of a biased sample period.

H. Fraud

Certain market participants have alleged fraud as a key underlying cause of certain CMBS defaults. One way of analyzing frequencies of adverse credit events across rating agencies would be to exclude deals where adverse credit events are attributable to fraud. We have not done so in our study. From an investor's standpoint, a default attributable to fraud hurts no less than one attributable to anything else. Moreover, in certain cases, it remains open to debate whether fraud was the primary cause of default, a contributing factor, or not a factor at all. Lastly, all participants in the CMBS market, including investment bankers, lawyers, accountants, issuers, trustees, investors, and the rating agencies, have an interest in promoting the use of safeguards and structures that inhibit fraud.¹⁰

V. Conclusion

Certain attributes of CMBS appear to provide strong signals regarding the likelihood of credit migrations. Deal type, vintage, initial rating level, and the combination of agencies that rated a security all provided some measure of signaling. Deal type and rating agency combination suggest themselves as being the attributes that could have the greatest practical application.

CMBS from single-borrower lease-backed deals distinguished themselves as having the highest frequency of adverse credit migrations. CMBS from all other types of deals made a much better showing. However, within the remaining deal types, material differences in frequencies were apparent. Resecuritizations, conduit deals, and seasoned loan deals displayed lower frequencies of

¹⁰ *Red Flags for Non-Investment Grade Seller/Servicees*, Fitch Research (2 Apr 1997) (Fitch doc. no. 12672); *Red Flags for Private Placement Issuers*, Fitch Research (17 Jul 1995) (Fitch doc. no. 5446); *Rating Guidelines for Health Care Receivables*, Fitch Research (20 Apr 1998).

adverse credit migrations than large loan deals and single-borrower (non-lease-backed) deals (see Charts 1b and 2). The market arguably ought to make a pricing distinction to reflect the difference.

Rating signals are a tougher story. The strong showing by CMBS rated by all three agencies is understandable. Such securities necessarily satisfy the toughest standards among the agencies. Likewise, it is not surprising that CMBS rated by two agencies tend to show lower frequencies of adverse credit migrations than those rated by just one. The explanation ought to be simply that "two sets of eyes are better than one." On the other hand, apparent performance differences between the rating agencies are tougher to explain. The data show that Fitch ratings provided much better signals of credit quality in the CMBS area than they did for ABS. It is not clear why this result occurs. Similarly, S&P ratings provided much better signals for ABS than they did for CMBS. Again, the data itself does not provide an explanation.

As the CMBS market continues to evolve and gains experience that spans multiple economic cycles, we will observe whether the trends reported here will continue or fade away. We expect that most observed differences in the frequency of credit migrations should tend to equalize as the market adjusts structures and credit enhancement levels for maximum efficiency. On the rating front, there ought to be a long-run trend toward equalization of performance. However, rating practices have substantial inertia and tend to evolve slowly. Accordingly, we expect rating practices to remain mostly stable in the near term.

VI. Appendix A – Selected CMBS Defaults and Near Defaults

A. DLJ Mortgage Acceptance 1993-MF2 (DLJMA 93-MF2)

Class	Orig. Amt.	Orig. Rating	8/94 Rating	9/94 Rating	3/95 Rating
A1 (IO)	0	Aa2	Baa2	B3	WR
A2	58,100	Aa2	Baa2	B3	WR
A3	58,100	Aa2	Baa2	B3	WR
B	29,050	Baa2	B1	Ca	WR

We classify DLJ Mortgage Acceptance series 1993-MF2 classes A1, A2, A3, and B as defaults. However, Class A1 was an interest-only class with no actual principal.

In the early 1990's DLJ executed a pair of ill-fated deals. Both were backed by properties developed and managed by real estate developer Morton Ginsberg. The properties and the deals ran into trouble, causing Moody's to drastically cut the ratings on the securities. The first of the two deals was executed before the 1992 starting point of this study's data set. The second deal, issued in 1993, falls within the ambit of our consideration.

After the deals got into trouble, DLJ offered to repurchase the outstanding securities from investors at a low-ball price.¹¹ Investors rejected DLJ's initial offer,¹² but the two sides ultimately reached an agreement.¹³ In the end, DLJ paid investors 98% of par for the outstanding class A securities and 90% for the class B securities.¹⁴ Subsequently, DLJ had to recognize losses on the repurchase of the bonds.¹⁵

We have classified the securities from DLJMA 93-MF2 as default for two reasons. First, the DLJ buy-back of the bonds in June 1995 was essentially a forced exchange. Investors faced the prospect of huge losses and were preparing to sue DLJ as underwriter of the bonds. DLJ offered a price that investors ultimately could not turn away from, although it was not enough to make them whole. Second, even after repurchasing the bonds at a discount, DLJ suffered further losses.

B. DR Structured Finance Corp. 1993-K1, 1994-K1, and 1994-K2

Class	Orig. Amt.	Orig. Rating	Latest Rating	Rating Agency
DRSLT 1993-K1 A1	110,927	A	C	S&P
DRSLT 1993-K1 A2	94,037	A	C	S&P
DRSLT 1994-K1 A1	74,618	A	C	S&P
DRSLT 1994-K1 A2	100,371	A	C	S&P
DRSLT 1994-K1 A3	48,127	A	C	S&P
DRSLT 1994-K2 A1	14,889	BBB+	C	S&P
DRSLT 1994-K2 A2	75,478	BBB+	C	S&P

We have classified the seven tranches listed above as "defaults" because ultimate payment defaults are inevitable. The seven tranches come from three deals, each of which is backed by pools of Kmart leases. Following Kmart's bankruptcy in January 2002, the company decided to close 283 of its stores.¹⁶ The closures hit the DRSLT deals in the form of lease rejections. According to S&P, four

¹¹ *DLJ Offers Discounted Payout to Holders*, Commercial Mortgage Alert (10 Oct. 1994).

¹² *Bondholders unimpressed by DLJ Rescue Bid*, Commercial Mortgage Alert (24 Oct. 1994).

¹³ *DLJ Hammers Out Pact on Ginsberg Bonds*, Commercial Mortgage Alert (21 Nov. 1994).

¹⁴ *DLJ's Buyback of the Ginsberg Bonds*, Commercial Mortgage Alert (21 Nov. 1994).

¹⁵ *DLJ Reveals Loss on Buyback*, Commercial Mortgage Alert (30 Oct. 1995).

¹⁶ *Kmart Agrees to Retain DJM Asset Management and ChainLinks Retail Advisors to Market 283 Leases in 40 States*, Kmart press release (4 Apr. 2002); *Kmart Corporation Releases List of Store Closings*, Kmart press release (8 Mar. 2002).

rejections hit series 1993-K1, nine hit 1994-K1, and two hit 1994-K2.¹⁷ The rejections caused cash flow shortfalls in the deals and forced the use of principal collections to meet interest payments on the securities. The deals are undercollateralized and will produce a loss of principal to investors.

¹⁷ *Ratings Lowered on Three Kmart Corp.-Related Credit Lease Transactions*, Standard & Poor's press release (23 Aug. 2002).

VII. Appendix B – Listing of CMBS Adverse Credit Migrations

Deal Types Codes:

B Conduit (lease-backed)	P Seasoned loans
C Conduit (non-lease backed)	R Resecuritization
L Lease-backed (single borrower)	S Floating rate (multiple borrowers)
M Large Loan (>\$20 million)	U Fusion
O Single-borrower (non-lease backed)	Z Other

For purposes of the charts and tables in the study, deal type codes **B**, **C**, **S**, **U**, and **Z** are aggregated together as "conduits"

Migration Type Codes

1. Default of a CMBS initially rated investment grade
2. Default of a CMBS initially rated speculative grade (major downgrade)
3. Near default of a CMBS initially rated investment grade
4. Near default of a CMBS initially rated speculative grade (major downgrade)
5. Major downgrade of a CMBS initially rated investment grade
6. Minor downgrade of a CMBS initially rated investment grade
7. Minor downgrade of a CMBS initially rated speculative grade

Issuer	Bloomberg Ticker	Vintage	Amount (\$ million)	Deal Type	Initial Rating			Migration Type
					Moody's	S&P	Fitch	
Asset Securitization Corp.	ASC 1995-D1B1	1995	17.9	C		BB	BB	7
Asset Securitization Corp.	ASC 1995-D1B2	1995	9.5	C		B	B	2
Asset Securitization Corp.	ASC 1996-D2A3	1996	52.8	C			A	7
Asset Securitization Corp.	ASC 1996-D2A4	1996	35.2	C		BBB	BBB	5
Asset Securitization Corp.	ASC 1996-D2B1A	1996	8.3	C		BB		7
Asset Securitization Corp.	ASC 1996-D2B1B	1996	46.5	C		BB		2
Asset Securitization Corp.	ASC 1996-D2B1H	1996	11.2	C		BB		2
Asset Securitization Corp.	ASC 1996-D2B2	1996	29.2	C		B		2
Asset Securitization Corp.	ASC 1996-D2B2H	1996	6.0	C		B		2
Asset Securitization Corp.	ASC 1996-MD6B1	1996	35.8	M			BB	7
Asset Securitization Corp.	ASC 1996-MD6B1H	1996	35.8	M			BB	7
Asset Securitization Corp.	ASC 1997-D5A5	1997	39.5	U		BBB	BBB+	6
Asset Securitization Corp.	ASC 1997-D5A6	1997	43.9	U		BBB-	BBB-	5
Asset Securitization Corp.	ASC 1997-D5A7	1997	21.9	U			BBB-	5
Asset Securitization Corp.	ASC 1997-D5B1	1997	39.5	U		BB+	BB+	7
Asset Securitization Corp.	ASC 1997-D5B2	1997	39.5	U			BB	7
Asset Securitization Corp.	ASC 1997-D5B3	1997	8.8	U			BB-	4
Asset Securitization Corp.	ASC 1997-D5B4	1997	13.2	U			B+	4
Asset Securitization Corp.	ASC 1997-D5B5	1997	13.2	U			B	4
Asset Securitization Corp.	ASC 1997-D5B6	1997	21.9	U			B-	4
Asset Securitization Corp.	ASC 1997-MD7A3	1997	40.0	M	A2		A	6
Asset Securitization Corp.	ASC 1997-MD7A4	1997	37.5	M	Baa2		BBB	5
Asset Securitization Corp.	ASC 1997-MD7A5	1997	27.5	M			BBB-	3
Asset Securitization Corp.	ASC 1997-MD7A6	1997	10.0	M			BBB-	3
Asset Securitization Corp.	ASC 1997-MD7B1	1997	12.5	M		BB		2
Asset Securitization Corp.	ASC 1997-MD7B1H	1997	12.5	M		BB		2
American Southwest Fin. Sec. Corp.	ASFS 1993-2B3	1994	6.4	C			B	4
American Southwest Fin. Sec. Corp.	ASFS 1994-1A1	1994	43.3	L		A-		6
Bear Stearns Comrc'l Mtg. Sec. Inc.	BSCMS 1999-CFL-1F	1999	2.9	B		B		7
Chase Comrc'l Mtg. Sec. Corp.	CCMSC 1998-1H	1998	18.4	U	B2			7

Issuer	Bloomberg Ticker	Vintage	Amount (\$ million)	Deal Type	Initial Rating			Migration Type
					Moody's	S&P	Fitch	
Chase Comrc'l Mtg. Sec. Corp.	CCMSC 1998-1I	1998	4.1	U	B3			4
Comrc'l Mtg. Acc. Corp.	CMAC 1997-ML1F1	1997	10.0	M	Ba1			7
Comrc'l Mtg. Acc. Corp.	CMAC 1997-ML1F2	1997	40.0	M	Ba3			7
Comrc'l Mtg. Acc. Corp.	CMAC 1997-ML1G	1997	50.0	M	B2			4
CNC Pass-Through Trust	CNC 1994-1A1	1994	66.4	L		AA	AA	5
CNC Pass-Through Trust	CNC 1994-1A2	1994	56.7	L		AA	AA	5
CNC Pass-Through Trust	CNC 1994-1A3	1994	43.6	L		AA	AA	5
CNC Pass-Through Trust	CNC 1994-1B	1994	9.8	L		A	A	3
CNC Pass-Through Trust	CNC 1994-1C	1994	7.8	L		BBB	A	3
CNC Pass-Through Trust	CNC 1994-1D	1994	7.8	L			BBB	3
COMM	COMM 2000-FL2AGWH	2000	1.5	S	Baa1		BBB+	5
COMM	COMM 2000-FL2AHWH	2000	1.0	S	Baa2		BBB	5
COMM	COMM 2000-FL2AJWH	2000	1.4	S	Baa3		BBB-	5
CS First Boston Mtg. Sec. Corp.	CSFB 1995-M1D	1995	2.7	P			BBB	6
CS First Boston Mtg. Sec. Corp.	CSFB 1995-M1E	1995	5.1	P			BB	7
CS First Boston Mtg. Sec. Corp.	CSFB 1995-M1F1	1995	2.7	P			B	2
CS First Boston Mtg. Sec. Corp.	CSFB 1995-M1F2	1995	2.7	P			B	2
Credit Suisse First Boston Mtg. Sec. Corp.	CSFB 1997-C1H	1997	27.1	U	B2	B	B	7
Credit Suisse First Boston Mtg. Sec. Corp.	CSFB 1997-C1I	1997	17.0	U	B3		B-	4
Credit Suisse First Boston Mtg. Sec. Corp.	CSFB 1997-C1J	1997	13.6	U	Caa2		CCC	2
Credit Suisse First Boston Mtg. Sec. Corp.	CSFB 1997-C2H	1997	29.3	U	B2		B	4
Credit Suisse First Boston Mtg. Sec. Corp.	CSFB 1997-C2I	1997	14.7	U	B3		B-	4
Credit Suisse First Boston Mtg. Sec. Corp.	CSFB 1998-C1H	1998	49.6	U		B		7
DLJ Comrc'l Mtg. Corp.	DLJCM 1998-ST2AA3	1998	23.8	S	A2			6
DLJ Comrc'l Mtg. Corp.	DLJCM 1998-ST2AB1	1998	23.2	S	Baa2			5
DLJ Comrc'l Mtg. Corp.	DLJCM 1998-ST2AB2	1998	4.4	S	Baa3			5
DLJ Comrc'l Mtg. Corp.	DLJCM 1998-ST2AB3	1998	15.1	S	Ba2			7
DLJ Comrc'l Mtg. Corp.	DLJCM 1998-ST2AB4	1998	1.3	S	Ba3			2
DLJ Comrc'l Mtg. Corp.	DLJCM 1998-ST2AB5	1998	7.5	S	B2			2
DLJ Comrc'l Mtg. Corp.	DLJCM 1998-ST2AB6	1998	2.5	S	B3			2
DLJ Mtg. Acc. Corp.	DLJMA 1993-MF2A1	1993		O	Aa2			1
DLJ Mtg. Acc. Corp.	DLJMA 1993-MF2A2	1993	58.1	O	Aa2			1
DLJ Mtg. Acc. Corp.	DLJMA 1993-MF2A3	1993	58.1	O	Aa2			1
DLJ Mtg. Acc. Corp.	DLJMA 1993-MF2B	1993	29.1	O	Baa2			1
DLJ Mtg. Acc. Corp.	DLJMA 1997-CF1B1	1997	26.9	C		BBB	BBB	6
DLJ Mtg. Acc. Corp.	DLJMA 1997-CF1B2	1997	11.2	C		BBB-		5
DLJ Mtg. Acc. Corp.	DLJMA 1997-CF1B3	1997	24.6	C		BB		2
DLJ Mtg. Acc. Corp.	DLJMA 1997-CF1B4	1997	13.4	C		B		2
DR Structured Fin. Corp.	DRSLT 1993-K1A1	1993	111.0	L		A		1
DR Structured Fin. Corp.	DRSLT 1993-K1A2	1993	94.0	L		A		1
DR Structured Fin. Corp.	DRSLT 1994-K1A1	1994	74.6	L		A		1
DR Structured Fin. Corp.	DRSLT 1994-K1A2	1994	100.4	L		A		1
DR Structured Fin. Corp.	DRSLT 1994-K1A3	1994	48.1	L		A		1
DR Structured Fin. Corp.	DRSLT 1994-K2A1	1994	14.9	L		BBB+		1
DR Structured Fin. Corp.	DRSLT 1994-K2A2	1994	75.5	L		BBB+		1
First Union-Lehman Brothers Comrc'l Mtg. Trust II	FULB 1997-C2J	1997	44.1	C		B		7
First Union-Lehman Brothers Comrc'l Mtg. Trust II	FULB 1997-C2K	1997	22.0	C		B-		4
First Union-Lehman Brothers Comrc'l Mtg. Trust II	FULB 1997-C2L	1997	27.5	C		CCC		7
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 1998-C1J	1998	14.4	U			BB-	7
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 1998-C1K	1998	25.2	U			B	7
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 1998-C1L	1998	14.4	U			B-	4

Issuer	Bloomberg Ticker	Vintage	Amount (\$ million)	Deal Type	Initial Rating			Migration Type
					Moody's	S&P	Fitch	
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 1999-CTL1C	1999	8.7	L		A	A	6
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 1999-CTL1D	1999	9.6	L		BBB	BBB	5
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 1999-CTL1E	1999	4.8	L		BB	BB	7
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 1999-CTL1F	1999	3.9	L		B	B	4
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 2002-LTAJ	2002	21.0	O	Ba1	BBB		7
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 2002-LTAK	2002	15.0	O	Ba1	BBB-		7
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 2002-LTAL	2002	5.0	O	Ba2	BB		7
GMAC Comrc'l Mtg. Sec. Inc.	GMACC 2002-LTAM	2002	35.0	O	Ba2	BB-		7
Highland Capital Group	HCMT 1993-1A	1993	21.0	L		A		5
Hilton Hotels Pool Trust	HHPT 2000-HLTB	2000	60.8	O	Aaa	AA+		6
Hilton Hotels Pool Trust	HHPT 2000-HLTC	2000	66.8	O	Aa2	AA-		6
Hilton Hotels Pool Trust	HHPT 2000-HLTD	2000	32.9	O	A1	A+		6
Hilton Hotels Pool Trust	HHPT 2000-HLTE	2000	24.7	O	A2	A		6
Hilton Hotels Pool Trust	HHPT 2000-HLTF	2000	46.9	O	A3	A-		6
J.P. Morgan Comrc'l Mtg. Fin. Corp.	JPMC 1995-C1F	1995	7.7	C		BB		7
J.P. Morgan Comrc'l Mtg. Fin. Corp.	JPMC 1995-C1G	1995	6.9	C		B		2
Kidder Peabody Acc. Corp. I	KP 1993-M3F	1993	4.0	C	B2		B	4
Lehman Brothers ABS Corp.	LABS 1994-C2A1	1994	65.8	L		BBB+		5
Lehman Brothers ABS Corp.	LABS 1994-C5A1	1994	41.1	L	Baa3	BBB+		3
Lehman Brothers ABS Corp.	LABS 1994-C5A2	1994	66.2	L	Baa3			3
LB Mtg. Trust	LBMT 1992-M1C2	1992	43.4	P		BB	BB	7
LB Mtg. Trust	LBMT 1992-M1C3	1992	43.4	P		B		2
LTC Remic Corp.	LTC 1996-1C	1996	7.6	Z		A	A	6
LTC Remic Corp.	LTC 1996-1D	1996	5.1	Z		BBB	BBB	6
LTC Remic Corp.	LTC 1996-1E	1996	11.8	Z		BB	BB	7
LTC Remic Corp.	LTC 1996-1F	1996	4.5	Z		B	B	4
Mtg. Capital Funding Inc.	MCFI 1997-MC1J	1997	9.9	C			B-	2
Merrill Lynch Mtg. Investors Inc.	MLMI 1996-C1F	1996	32.4	C		B	B-	2
Merrill Lynch Mtg. Investors Inc.	MLMI 1996-C2F	1996	62.6	C		BB	BB-	7
Merrill Lynch Mtg. Investors Inc.	MLMI 1996-C2G	1996	39.8	C		B	B-	4
Merrill Lynch Mtg. Investors Inc.	MLMI 1997-C1F	1997	50.4	C		BB		7
Merrill Lynch Mtg. Investors Inc.	MLMI 1997-C1G	1997	8.4	C		BB-		7
Merrill Lynch Mtg. Investors Inc.	MLMI 1997-C1H	1997	16.8	C		B		2
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C1D	1998	38.8	B	Baa2	BBB		6
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C1E	1998	9.7	B	Baa3	BBB-		5
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C1H	1998	4.8	B			B	2
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C1J	1998	1.6	B			B-	2
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C3D	1998	38.3	C	Baa2	BBB		6
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C3E	1998	8.0	C	Baa3	BBB-		5
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C3F	1998	35.1	C		BB		7
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C3G	1998	4.8	C		BB-		7
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C3H	1998	14.4	C		B		2
Merrill Lynch Mtg. Investors Inc.	MLMI 1998-C3J	1998	3.2	C		B-		2
Merrill Lynch Mtg. Investors Inc.	MLMI 1999-C1G	1999	23.7	C		BB	BB	7
Merrill Lynch Mtg. Investors Inc.	MLMI 1999-C1H	1999	20.7	C		B	B	2
Merrill Lynch Mtg. Investors Inc.	MLMI 1999-C1J	1999	3.0	C		B-	B-	2
Morgan Stanley Capital I Inc.	MSC 1995-HF1F	1995	7.7	C		B	B-	2
Morgan Stanley Capital I Inc.	MSC 1998-CF1E	1998	19.4	C	Baa3	BBB-		5
Morgan Stanley Capital I Inc.	MSC 1998-CF1F	1998	22.1	C	Ba1	BB+		7
Morgan Stanley Capital I Inc.	MSC 1998-CF1G	1998	33.2	C	Ba2	BB		2
Morgan Stanley Capital I Inc.	MSC 1998-CF1H	1998	11.1	C	Ba3	BB-		2
Morgan Stanley Capital I Inc.	MSC 1998-CF1J	1998	11.1	C	B1	B+		2
Morgan Stanley Capital I Inc.	MSC 1998-CF1K	1998	19.4	C	B2			2
Morgan Stanley Capital I Inc.	MSC 1998-CF1L	1998	11.1	C	B3			2
Morgan Stanley Capital I Inc.	MSC 1998-CF1M	1998	5.5	C	Caa2			7
Nomura Asset Securitization Corp.	NASC 1994-MD1B2	1994	24.6	M			BB	7
Nomura Asset Securitization Corp.	NASC 1994-MD1B3A	1994	24.8	M			B	2
Nomura Asset Securitization Corp.	NASC 1994-MD1B3B	1994	24.6	M			B	2
Nomura Asset Securitization Corp.	NASC 1994-MD1B3P	1994	24.8	M			B	2

Issuer	Bloomberg Ticker	Vintage	Amount (\$ million)	Deal Type	Initial Rating			Migration Type
					Moody's	S&P	Fitch	
NationsLink Funding Corp.	NLFC 1999-LTL1C	1999	20.9	B	A2	A	A	6
NationsLink Funding Corp.	NLFC 1999-LTL1E	1999	11.1	B		BB		7
NationsLink Funding Corp.	NLFC 1999-LTL1F	1999	3.7	B		B		4
Prudential Sec. Secured Financing Corp.	PSSF 1995-C1E	1995	9.5	C		BB		2
Prudential Sec. Secured Financing Corp.	PSSF 1995-C1F	1995	5.3	C		B		2
Prudential Sec. Secured Financing Corp.	PSSF 1995-MCF2G	1995	12.2	C		BB	BB-	2
Prudential Sec. Secured Financing Corp.	PSSF 1995-MCF2H	1995	11.1	C		B	B-	2
Rite Aid Pass-Through Trust	RAID 1999-1A1	1999	75.0	L	Baa1			5
Rite Aid Pass-Through Trust	RAID 1999-1A2	1999	92.6	L	Baa1			5
RMF	RMF 1995-1F	1995	7.3	C		B	B	7
RMF COMRC'L MTG.	RMF 1997-1H	1997	4.0	Z			B-	4
Structured Asset Sec. Corp.	SASC 1993-C1A3	1993	15.9	P		AAA	AAA	5
Structured Asset Sec. Corp.	SASC 1993-C1B	1993	26.6	P		AA	AA	6
Structured Asset Sec. Corp.	SASC 1993-C1C	1993	26.6	P		A	A	6
Structured Asset Sec. Corp.	SASC 1993-C1D	1993	26.6	P		BBB	BBB	5
Structured Asset Sec. Corp.	SASC 1993-C1E	1993	42.6	P		BB	BB-	2
Structured Asset Sec. Corp.	SASC 1993-C1F	1993	26.6	P		B	B-	2
Salomon Brothers Mtg. Sec. VII Inc., CDC Securitization Corp.	SBM7 2001-CDCEGF	2001	5.7	S	Baa1	BBB+		5
Salomon Brothers Mtg. Sec. VII Inc., CDC Securitization Corp.	SBM7 2001-CDCFGF	2001	3.5	S	Baa3	BBB-		5
Salomon Brothers Mtg. Sec. VII Inc., CDC Securitization Corp.	SBM7 2001-CDCGGF	2001	6.9	S	Baa3			5
Strategic Hotel Capital LLC	SHCI 2001-C1AC	2001	86.8	O	A1	A-		6
Strategic Hotel Capital LLC	SHCI 2001-C1AD	2001	69.4	O	Baa2	BBB		5
Strategic Hotel Capital LLC	SHCI 2001-C1AE	2001	21.5	O	Baa3	BBB-		5
Strategic Hotel Capital LLC	SHCI 2001-C1AF	2001	17.0	O	Baa3			5
Steiner Properties LLC	STEIN 1997-1A	1997	60.4	L	Aa3			6
Wal-Mart Stores Trust-13	WMSI 1992A1	1992	201.3	L	Aa1	AA		6
Wal-Mart Stores Trust-13	WMSI 1992A2	1992	72.1	L	Aa1	AA		6
Wal-Mart Stores Inc. Pass-Through Trusts	WMSI 1994A1	1994	160.0	L	Aa1	AA		6
Wal-Mart Stores Inc. Pass-Through Trusts	WMSI 1994A2	1994	72.1	L	Aa1	AA		6
Wal-Mart Stores Inc. Pass-Through Trusts	WMSI 1994B1	1994	81.0	L	Aa1	AA		6
Wal-Mart Stores Inc. Pass-Through Trusts	WMSI 1994B2	1994	90.6	L	Aa1	AA		6
Wal-Mart Stores Inc. Pass-Through Trusts	WMSI 1994B3	1994	45.5	L	Aa1	AA		6

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