Board of Governors of the Federal Reserve System

International Finance Discussion Papers

Number 809

July 2004

Good News Is No News?
The Impact of Credit Rating Changes on the Pricing of Asset-Backed Securities

John Ammer and Nathanael Clinton

Good News Is No News?
The Impact of Credit Rating Changes on the Pricing of Asset-Backed Securities

John Ammer and Nathanael Clinton*

Abstract: We assess the impact of credit ratings on the pricing of structured financial products, using a sample of more than 1300 changes in Moody's or Standard and Poor's (S&P) ratings of U.S. asset-backed securities (ABS). We find that rating downgrades tend to be accompanied by negative returns and widening spreads, with the average effects stronger than those that have been reported in prior research on corporate and sovereign bond ratings. A portion of the negative implications of ABS downgrades are anticipated by price movements ahead of the rating action, although to a lesser degree than has been found for bond ratings. Accordingly, ABS market participants appear to rely somewhat more on rating agencies as a source of *negative* news about credit risk. Nevertheless, because ABS rating downgrades are relatively rare events, their effects account for only a small fraction of the variance of returns. In contrast to our results on downgrades, market reactions to ABS rating upgrades are virtually zero, on average. Together, the results imply even greater asymmetry in the value-relevance of ABS rating changes than has been found in event studies of changes in bond ratings.

Keywords: structured finance, credit ratings, asset-backed securities, event study.

* Senior Economist and Research Assistant, respectively, in the Division of International Finance of the Federal Reserve Board. Email addresses for the authors are John.Ammer@FRB.gov and Nathanael.A.Clinton@FRB.gov. The paper is forthcoming as a chapter (with a shorter title) in *Structured Products*, a *Risk Books* volume edited by William Perraudin. The views in this paper are solely the responsibility of the authors and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System.

1. Introduction: Credit Ratings as a Source of Market Information

Although conventional notions of efficient markets imply that the pricing of debt securities will reflect any available information about the creditworthiness of the obligor, financial theory alone offers little hint of how market participants acquire it. For about a century in U.S. corporate bond markets, ratings assigned by private independent agencies such as Moody's and Standard and Poor's (S&P) have been one of the possible channels through which investors might obtain credit information. Despite the long history, available evidence about the importance of credit ratings to debt markets is somewhat conflicting and inconclusive.

There are a number of pieces of circumstantial and anecdotal evidence that imply that credit ratings may be quite important to the functioning of bond markets. As documented in Estrella et al (2000), most public debt securities have at least one agency rating, and a majority of the issuers voluntarily pay fees to be rated. A United States Securities and Exchange Commission (2003) report argues that ratings have become more important over time, and notes their increasing use in private contracts (such as ratings-based "triggers" in debt covenants) and in financial regulation worldwide. Ferri, Liu, and Stiglitz (1999) and Reisen and von Maltzan (1999) conjecture that by the time of the 1998 Asian financial crisis, investors' reliance on emerging market sovereign bond ratings had reached the point where the ratings became a potentially destabilizing factor, and perhaps a focal point for herd behaviour, as too many investors accepted them uncritically.

However, there is also a body of empirical research that points to a fairly limited marginal contribution by credit ratings to market information about corporate and sovereign borrowers. Cantor and Packer (1996) show that most of the credit information in a cross-section of sovereign ratings is also present in a set of readily observable macroeconomic variables, so

that the ratings serve largely as a convenient summary measure of the relevant public information. For U.S. corporate bonds, Campbell and Taksler (2003) conclude that yield spreads are more closely associated with the recent historical volatility of the bond issuer's stock price than with the bond rating, broadly consistent with asset pricing models that emphasize second moments.

Event studies of bond ratings changes have typically discovered average pricing reactions that were in the expected direction but small in magnitude. For example, in a study of changes in U.S. corporate bond ratings between 1977 and 1982, Hand, Holthausen, and Leftwich (1992) report an average impact from a downgrade of -1.27 percent on the bond return and -1.52 percent on the associated stock return, with the effect going in the opposite of the expected (negative) direction in roughly 40 percent of the cases. For upgrades, their results are even weaker: a mean of 0.35 percent for the bond return and 0.24 percent for the stock return. Analysis of rating changes in other bond markets generally has documented similarly modest effects.[1]

We do not know of any previous event studies of the impact of changes in the credit ratings of asset-backed securities (ABS), which, for a number of reasons, may have somewhat different properties and implications than corporate bond ratings. In particular, ABS issuers are limited-purpose trusts of finite duration with relatively inflexible restrictions on managerial discretion. Accordingly, the underlying risks, as well as the incentives and scope for action in the face of financial distress, may be rather different than for an operating firm, which in turn may affect the dynamics of fluctuations in credit quality. Hu and Cantor (2003) characterize

[1] See Creighton, Gower, and Richards (2004) for Australian evidence, Steiner and Henke's (2001) work on Eurobonds, and both Cantor and Packer (1996) and Brooks et al (2004) for the effects of sovereign rating changes. One interesting nuance is reported in a study by Elayan, Hsu, and Meyer (2003) of the New Zealand market, where rating changes have a weaker impact on firms that are cross-listed in the United States and thus are covered by more equity analysts.

Moody's structured finance ratings as more stable than their corporate ratings, in the sense that changes in ratings are rarer events, which is particularly true for Aaa-rated securities. However, Moody's structured finance rating migrations are more likely to entail moves of several notches at a time, compared to an average change of about 1.5 notches for corporate bonds.[2] As a consequence, precipitous declines in credit standing to Caa or lower within a year of an investment-grade rating are much more common in structured finance than for bonds, and Hu et al (2004) documents this effect for ABS in particular. However, Hu et al (2003) points out the higher probability of near-term impairment on investment-grade structured finance securities is offset by a significantly lower historical average loss given default than on corporate bonds. The combination of more frequent but less severe defaults is a natural consequence of diversification in the underlying portfolios.

Another fundamental difference is that most ABS tranches are claims against a portfolio of payment obligations from borrowers with much smaller balance sheets than the typical bond issuer. Thus, some of the means by which credit information about large borrowers is disseminated simply do not exist for the individual credits in the portfolios underlying ABS. Relative to the credit information available to managers of bond portfolios, it is not clear to what extent sources specifically geared toward ABS investors, such as the ABSNet service, industry trade journals, and investment bank newsletters provide comparable intelligence at a similar cost. Clark et al (2003) speculate that investors in structured financial products such as ABS have both less capacity and less incentive to monitor the creditworthiness of borrowers themselves, so that

[2] Although the pattern of rarer but larger rating changes may well arise from differences in the underlying credit risk dynamics, an alternative explanation is relatively infrequent monitoring by the rating agencies. In our empirical analysis, we encountered a number of examples of simultaneous rating changes for a number of securities of a similar type, also consistent with only sporadic review of ABS ratings.

they consequently will need to rely to a greater degree on third parties, such as rating agencies. Given that a majority of ABS bear less credit risk and have shorter maturities than the typical corporate bond, the pay-off to the ABS holder of additional monitoring effort is likely to be less than for a corporate bond investor.

2. Data Description

The data we use for our event study of ABS credit rating changes is based on Merrill Lynch's Asset-Backed Fixed and Floating Rate Index, going back to the end of 1996. Specifically, we downloaded from Bloomberg a sequence of cross-sectional files containing various data fields for each constituent member, including security identifiers, maturity, composite credit rating, amount outstanding, price, yield, duration, option-adjusted spread, total return, and the general category of the underlying collateral assets. Table 1 contains summary statistics for the data as of the end of each year in our sample.

The index covers a variety of types of ABS, with a heavy emphasis on collateral assets based on sundry forms of consumer credit. In all cases, the underlying assets are located in the United States and the securities are denominated in dollars. The categories that are broken out separately in the dataset are automobile loans, credit card receivables, home equity loans, manufactured housing loans, and utility company receivables. There is also a miscellaneous category within which we were able to identify deals based on streams of receivables such as student loan payments, aircraft leases, payments to state governments under a legal settlement with tobacco companies, recreational vehicle loans, and industrial equipment leases. At the end of 2003, the 3,673 securities in the index had an aggregate market value of about $650 billion. The proportion of floating-rate instruments in the index has risen to nearly half. We use data on

the floaters in empirical exercises based on returns, but the files do not provide estimates of yields, spread, or duration for floaters (and we did not have enough information about the terms of the instruments to compute these figures independently). At the very beginning of the sample, however, credit rating data were missing for all of the floating-rate instruments.

Each security has a three-part description field that consists of a ticker, series code, and a class identifier. Generally, the ticker corresponds to the sponsor of the deal, the series code identifies the specific special-purpose trust that holds the underlying assets and issued the security (the "deal", in common parlance), and the class identifier specifies the particular tranche of notes. We were able to use the ticker and series to infer relationships among the securities. In many cases, we were able to infer the name that corresponded to a ticker and cross-check deal information in other sources. In most cases, the CUSIP identifier was also available. Price data are available at a daily frequency, but the rating and amount outstanding (and the index membership) are updated only at the end of the month.

The credit ratings given in the dataset are a composite of Moody's and S&P's, using the average based on the standard mapping between their respective rating scales (rounding down, if necessary), when both are available. As calculated by Carron, Dhrymes, and Beloreshki (2003), Moody's rated somewhat more ABS than S&P did over our sample period, although deals rated either by S&P only or by both are fairly common occurrences. Fitch also rated many of the ABS in the Merrill Lynch index, but their ratings are not incorporated into the composite rating.

Note also that a majority of the index securities are rated AAA. The data set systematically excludes securities that are speculative-grade (rated below BBB3) or have outstanding principal of less than $25 million, which are mechanically deleted from the index. The median values shown in Table 1 reveal a prototypical ABS that is shorter in maturity and

duration and smaller in market value than the average corporate bond that trades in secondary markets in the United States. (For comparison, at the end of 2003, the bonds in Merrill Lynch's Corporate Master index had a median market value of $324 million, a median maturity of 6.8 years, and a median duration of 5.2 years.) Mean yield spreads, shown separately in the table for AAA and for lower-rated ABS, have widened over the seven-year sample, and stood substantially higher for these ABS by the end of 2003 than for a comparable portfolio of short-term investment grade corporate bonds.

Because the composite credit ratings are updated only at the end of the month, we conduct the analysis at a monthly frequency. An upgrade or downgrade is inferred when a different rating for a security is shown than in the previous month.[3] This means that we may miss some single-notch rating changes by either S&P or Moody's that leave the composite rating unchanged, but all of our inferred rating change events should include at least one genuine move in the same direction. Table 2 reports summary statistics for the 819 downgrades and 473 upgrades of index securities that we identify between 1997 and 2003. Because of cases in which more than one tranche of a deal was included in a rating change, the number of events is reduced from 1,292 to 1,051 when we count them at the issuer level. Furthermore, in many instances ratings were changed simultaneously for related issuers with the same sponsor, as implied by a common ticker. Accordingly, the number of events would be further reduced to just 395, if we were to count them at the sponsor level. ABS rating changes are also clustered over time, with

[3] In a few cases, rating changes implied by the rating field in the Merrill Lynch files seemed implausible, so we excluded them from our sample. In a handful of cases, the files included a speculative-grade rating (which, if correct, should have caused the security to be excluded from the index). We checked these ratings against other sources and concluded that these speculative-grade ratings were data recording errors. Second, in a number of cases, there was a multi-notch rating change that was reversed the following month. For these, we assumed that the rating had probably not changed at all.

very few occurring in 2000 and 2001, compared to earlier and later years. The manufactured housing sector accounted for a disproportionate share of ABS credit rating downgrades between 1997 and 2003.

A majority of the events involve a change in the composite rating of only one notch. However, it should be noted that for securities that are rated by both Moody's and S&P, these single-notch changes in the composite rating could involve a change of as much as three notches in one agency's rating, if the other agency's rating were unchanged. Because securities are deleted from the index if they drop below investment-grade, the impact on pricing of becoming a "fallen angel" cannot be incorporated into the study from the Merrill Lynch file alone, which creates a potential for a "survivorship" bias in our results from the consequent censoring of the sample. To address this problem, we extracted from Bloomberg the latest S&P and Moody's ratings given for each ABS that had been deleted from the index during the sample period, whenever we were able to match it either by the CUSIP identifier, or by ticker, series, and class. By this means, we were able to identify 73 securities that were deleted from the index because they had been downgraded to speculative-grade, and we include them in our sample for the contemporaneous tests by measuring pricing changes to their last day in the index. In contrast, we found only 13 examples of "rising devils", which had the converse experience of an upgrade to investment grade. No pricing data was available for these ABS until the month after they were raised to investment grade, so these upgrades could not be included on our sample.

3. Estimation and Results

The first two columns in Table 3 show our most basic results for the 819 downgrade events and 473 upgrade events -- the average returns on the corresponding ABS in the month of

the rating change. These figures are expressed as excess returns, by subtracting the same month's return on the whole ABS index, thus controlling implicitly for general market movements. An advantage of casting the results in terms of returns, rather than changes in yield spreads is that we are able to include rating events for floating-rate securities. On average, downgrades are accompanied by a negative return on the affected ABS of nearly three percentage points, a larger impact than found by Hand, Holthausen, and Leftwich (1992) for their earlier sample of rating announcements for U.S. corporate bonds. The stronger reaction is consistent with a somewhat greater reliance by ABS investors on rating agencies as a source of credit information. Nevertheless, our results are a long way from suggesting that ABS trading decisions depend on ratings alone; almost 40 percent of our downgraded ABS had positive excess returns during the event month, implying either that market participants are dismissing the rating decision, or that the information conveyed by the downgrade had already been incorporated into market prices.

The third column shows results for downgrades at the issuer level. In months in which multiple classes of the same ABS deal have been downgraded, we construct a value-weighted excess return for the affected tranches. The elimination of multiple downgrades among the same ABS series reduces the sample size from 819 to 615, but it avoids double-counting reactions to rating agency judgments about deterioration in a given ABS portfolio, the principal cause of credit rating downgrades. Accordingly, we use this framework to confirm with a t test that the mean excess return associated with ABS downgrades is significantly different from zero. The magnitude of the mean excess downgrade return is smaller for issuer-level downgrades, because the weighting is generally reduced for junior tranches, which tend to have particularly negative price reactions.

In contrast, the estimated mean effect of ABS upgrades is virtually zero, although the 57 percent with pricing reactions in the expected positive direction *is* statistically distinguishable from the 50 percent probability that would be implicit if ratings had no relevance at all. Accordingly, the median contemporaneous excess return of the ABS upgrades is slightly above zero. Prior event studies with bond ratings have also found weaker results for upgrades. There are at least two possible explanations for this asymmetry. First, the immediate implications for credit risk seem to be somewhat greater for downgrades than for upgrades, because a one-notch difference in bond ratings has larger consequences for both default rates and for market spreads the lower the rating gets, especially at shorter maturities. The asymmetric effect of this convexity is bolstered in our sample by the fact that multi-notch changes are less common for upgrades and by the relatively short maturity of many of the securities in our sample. Second, in a study of conditional effects in the dynamics of Moody's bond ratings, Hamilton and Cantor (2004) found that for Moody's bond ratings, there has been more serial correlation in downgrades than in upgrades. Hu and Cantor (2003) report even stronger asymmetry in serial correlation in Moody's structured finance ratings.

To facilitate comparisons with some of the more recent literature on bond ratings, Table 4 reconfigures our event study in terms of changes in the yield spreads over the U.S. Treasury curve. Because spreads on the ABS in our index are only available for the fixed-rate securities, the sample size is somewhat reduced, but the results are nevertheless quite striking. The mean reaction to downgrades is a widening of spreads by 159 basis points in the event month. At first blush, this figure seems at odds with an average excess return of less than 3 percent, but the apparent conflict is explained by the short duration of most ABS -- a median of only about two years, so that a relatively moderate price change can imply a quite substantial change in yield.

Two other features of yield spread reactions to downgrades are worthy of note. First, the median spread change is only 19 basis points, so that the much higher mean change reflects a distinctly skewed distribution, with roughly half of the spread changes near zero, but many others quite large. Second, spreads widen much more (an average of 733 basis points) for fallen angels. Covitz and Harrison (2003), who study monthly changes in the composite credit ratings of U.S. corporate bonds over a similar sample period, also report median yield spread reactions to downgrades that are a lot stronger for fallen angels than for bonds that remained at investment-grade. However, they find smaller median reactions than we do for both types of downgrades at a one-month event horizon. For upgrades of corporate bonds within investment grade, Covitz and Harrison find a median change of -1 basis point, identical to our result for ABS upgrades.

Next, we will explore how various features of ABS affect their sensitivity to credit ratings. Table 5 shows the outcomes of regressions of excess returns in the month of an upgrade or downgrade versus characteristics of the security, the issuer, and the rating event.[4] With an adjusted R-squared of 38 percent, we are much more successful in explaining variation in downgrade effects than in accounting for reactions to upgrades, where the adjusted R-squared is only 13 percent. Downgrade returns are more negative and upgrade returns are more positive for ABS with longer duration, likely reflecting the combination of two effects. First, an evolutionary development in credit quality is likely to have stronger implications for the risk of loss for securities for which scheduled principal repayment is further into the future. Second, for a given change in the yield spread, the effect on the contemporaneous return will increase directly with the ABS' duration.

[4] For the multivariate regressions, the sample is reduced to 620 downgrades and 308 upgrades, because we exclude floating-rate securities for lack of duration data on these.

The level of the rating before and after the change also affects the contemporaneous return. Not surprisingly, downgrade returns are more negative and upgrade returns are more positive for sharper changes in agency opinion, as reflected in the number of notches by which the composite rating is modified. In addition, downgrade returns are less negative when the initial rating is higher, reflecting the fact that default is still a relatively remote possibility. Third, fallen angels have much larger negative downgrade returns than we see for rating reductions within the investment-grade range. This also arises in event studies of bond ratings, and Steiner and Heinke (2001) suggest that the use of credit ratings in financial regulation has conferred an artificial importance to the investment-grade boundary. However, default rates increase sharply as ratings move below investment grade, and speculative grade defaults appear to be more cyclically sensitive as well, so the strong market reaction to fallen angels might be justifiable on the basis of the pure credit risk implications, particularly if the underlying credit deterioration had gone unnoticed by investors before the rating downgrade.

We also control for broad ABS categories by including dummy variables in the regression specification. To some degree, excess return reactions also appear to depend on the type of underlying collateral, although not all of the estimated effects are statistically significant. All else equal, downgrade reactions are much less negative for home equity ABS, perhaps because the underlying assets are backed by relatively stable real estate collateral. Meanwhile, upgrade returns are substantial higher when the underlying portfolio consists of credit card or utility company receivables, which are not typically backed by collateral. Given that ratings are intended to reflect expected loss, irrespective of the nature of the underlying cash flow, these differences in market reactions may in part reflect investors' independent judgments about relative risk.

We also include a time trend in the equations. To the extent that alternative sources of credit information have developed as the ABS market has matured, one might expect the reliance of investors on credit ratings to have diminished over time, but the signs on our estimated coefficients suggest the contrary. On average, downgrade returns were more negative and upgrade returns were more positive later in the sample period.

In recent years, rating agencies have sometimes been criticized for being too slow to recognize changes in the creditworthiness of rated borrowers. If alternative information sources exist, one might then expect prices to change ahead of ratings. Figures 1 and 2 show, respectively, the average patterns of a total return index around the event month of an ABS that has been downgraded or upgraded. The excess return on an ABS with an imminent downgrade tends to be negative in the prior two months, and the tests shown in Table 6 reveal that the effect is statistically significant in the second month before the downgrade. However, the extent of anticipation, as gauged by the proportion of the total pricing reaction that occurs before the downgrade, is markedly less than found for corporate bonds by Covitz and Harrison (2003). In contrast, the average total return pattern for upgrades in Figure 2 is puzzlingly flat -- before, during, and after the upgrade -- as if the rating change were completely irrelevant.

The lack of market reaction to a rating upgrade raises the question of whether the positive information implicit in the rating change has already been priced into upgraded ABS well in advance, or whether investors dismiss this information as inaccurate. In other words does an ABS with an impending upgrade tend to be priced as if it already had its future (higher) rating, or does it continue to be priced after the upgrade as if it still had its former (lower) rating? To address this issue, we estimate rating-specific yield curves, in which yield to maturity is a locally linear function of duration, using the locally-weighted regression method of Cleveland (1979).

Figure 3 shows time series of the two-year duration points of several of our estimated yield curves. We estimated separate yield curves for home equity ABS and for manufactured housing ABS, because we noticed that in some periods, yields were significantly higher for these categories than for other types of ABS. Other ABS categories are pooled for the purpose of the yield curve estimation.

For securities about to undergo a ratings change, Table 7 shows average deviations of their yield at the end of the previous month from each of two yield curves -- the curve for their current rating, and the curve for the rating they are on the point of getting. Note that the samples are constrained to ABS for which there were at least 5 points available to estimate each of the two requisite yield curves, even after securities on the cusp of a ratings change were excluded from the curve fitting. For imminent downgrades, the typical ABS yield stood slightly above their current yield curves and 1.35 percentage points below their future curves, consistent with their credit quality being perceived by market participants as in line with their old rating. This result helps explain the sizable average contemporaneous market reaction to downgrades. In contrast, our estimated deviations for imminent upgrades are somewhat puzzling. On average, the pre-event ABS yield for an imminent upgrade stood 22 basis points above the yield curve applicable to its current rating, more as if the market was concerned about a possible downgrade than expecting an upgrade. Together with the lack of significant reaction in yield spreads to upgrades seen in Table 4, the results here are broadly consistent with ABS investors being skeptical of upgrades.

4. Concluding Remarks

In summary, we find that on average, rating downgrades are accompanied by negative

returns and widening spreads, with the effects stronger than those have been reported in prior research on corporate and sovereign bond ratings. The sharp increases in yield spreads that we see for downgrades to speculative-grade stand out in particular. We also find that a smaller fraction of the negative downgrade return for ABS occurs ahead of the rating action than has been reported for corporate bond downgrades. Taken together, these results suggest that ABS market participants appear to rely somewhat more on rating agencies as a source of *negative* credit news. Nevertheless, because ABS rating downgrades are relatively rare events, their effects account for only a small fraction of the variance of returns. Furthermore, about 40 percent of the time, downgrade returns for ABS are not even negative. In contrast to our results on downgrades, market reactions to ABS rating upgrades are virtually zero, on average. These results imply even greater asymmetry in the value-relevance of ABS rating changes than has been found in event studies of changes in bond ratings.

It is worth noting that our discussion up to now has been based on an implicit assumption that ABS pricing is informationally efficient. It is at least conceivable that some of the asymmetries we discover in event-month returns arise because the market either over-reacts or under-reacts to certain types of rating changes because of behavioral biases. If so, the pricing error would eventually be corrected in future periods, leading to abnormal excess returns. Our examination of average returns around rating changes does not reveal any systematic pattern in the first three months after the event, but the requisite pricing correction, if any, might occur later, an issue we will leave for future research.

REFERENCES

Brooks, Robert, Robert Faff, David Hillier, and Joseph Hillier, 2004, "The National Market Impact of Sovereign Rating Changes", *Journal of Banking and Finance,* pp 223-50, January.

Campbell, John and Glen Taksler, 2003, "Equity Volatility and Corporate Bond Yields", *Journal of Finance*, pp 2321-49, December.

Cantor, Richard and Frank Packer, 1996, "Determinants and Impact of Sovereign Credit Ratings", *Federal Reserve Bank of New York Economic Policy Review,* pp 37-53, October.

Carron, Andrew, Phoebus Dhrymes, and Tsvetan Beloreshki, 2003, "Credit Ratings for Structured Products", NERA Economic Consulting report, 6 November.

Clark, Alastair, et al, 2003, "Credit Risk Transfer", Report submitted by a Working Group established by the Committee on the Global Financial System, Bank for International Settlements, January.

Cleveland, William, 1979, "Robust Locally Weighted Regression and Smoothing Scatter Plots", *Journal of the American Statistical Association*, pp 829-36, December.

Covitz, Daniel and Paul Harrison, 2003, "Testing Conflicts of Interest at Bond Rating Agencies with Market Anticipation: Evidence that Reputation Incentives Dominate", *Finance and Economics Discussion Series* paper 2003-68, Federal Reserve Board, December.

Creighton, Adam, Luke Gower, and Anthony Richards, 2004, "The Impact of Rating Changes in Australian Financial Markets", Research Discussion Paper 2004-02, Reserve Bank of Australia, March.

Elayan, Fayez, Wei Huei Hsu, and Thomas Meyer, 2003, "The Informational Content of Credit Rating Announcements for Share Prices in a Small Market", *Journal of Economics and Finance,* pp 337-56, Fall.

Estrella, Arturo, et al, 2000, "Credit Ratings and Complementary Sources of Credit Quality Information", Basel Committee Working Paper No 3, Bank for International Settlements, August.

Ferri, Giovanni, Li-Gang Liu, and Joseph Stiglitz, 1999, "The Procyclical Role of Rating Agencies: Evidence from the East Asian Crisis", *Economic Notes,* pp 335-55, November.

Hamilton, David and Richard Cantor, 2004, "Rating Transitions and Defaults Conditional on Watchlist, Outlook, and Rating History", Moody's Investors Service Special Comment, February.

Hand, John, Robert Holthausen, and Richard Leftwich, 1992, "The Effect of Bond Rating Agency Announcements on Bond and Stock Prices", *Journal of Finance,* pp 733-52, June.

Hu, Jian, and Richard Cantor, 2003, "Structured Finance Rating Transitions: 1983-2002 -- Comparisons with Corporate Ratings and Across Sectors", Moody's Investors Service Special Comment, January.

Hu, Jian, et al, 2003, "Payment Defaults and Material Impairments of U.S. Structured Finance Securities: 1993-2002", Moody's Investors Service Special Comment, December.

Hu, Jian, et al, 2004, "Structured Finance Rating Transitions: 1983-2003 -- Ratings Remain Volatile in 2003 but Downgrade-to-Upgrade Ratio Falls Sharply", Moody's Investors Service Special Comment, February.

Reisen, Helmut and Julia von Maltzan, 1999, "Boom and Bust and Sovereign Ratings", *International Finance,* pp 273-93, July.

Steiner, Manfred and Volker Heinke, 2001, "Event Study Concerning International Bond Price Effects of Credit Rating Actions", *International Journal of Finance and Economics,* pp 139-57, April.

United States Securities and Exchange Commission, 2003, "Report on the Role and Function of Credit Rating Agencies in the Operation of the Securities Markets", January.

TABLE 1: Sample Statistics for Merrill Lynch ABS Index Members

	12/31/1996	12/31/1997	12/31/1998	12/31/1999	12/31/2000	12/31/2001	12/31/2002	12/31/2003
Usable number of securities	607	1029	1192	1335	1348	1142	2094	3673
Median:								
maturity (years)	5.8	5.0	4.2	3.7	2.8	2.5	2.4	2.2
duration (years)	1.9	1.8	1.9	2.2	2.1	2.4	1.6	1.4
market value ($ millions)	32.7	39.9	41.6	44.5	47.4	57.9	60.4	76.1
Yield spread (basis points):								
AAA-rated	39	61	110	95	110	132	93	84
below AAA-rated	49	103	205	233	262	297	401	469
Proportion which are:								
fixed rate	100.0%	81.2%	84.1%	87.6%	83.0%	72.3%	57.8%	50.7%
floating rate	0.0%	18.9%	15.9%	12.4%	17.0%	27.7%	42.2%	49.3%
Rated:								
AAA	77.1%	75.4%	73.1%	70.7%	72.0%	68.2%	61.2%	69.3%
AA1	0.0%	0.0%	0.2%	0.3%	0.5%	0.4%	1.6%	0.9%
AA2	8.7%	3.7%	2.7%	4.3%	4.5%	3.8%	7.6%	7.8%
AA3	3.3%	3.1%	4.0%	2.9%	2.8%	3.4%	2.7%	1.0%
A1	0.3%	3.5%	2.4%	1.4%	1.1%	1.1%	1.9%	1.9%
A2	7.9%	3.3%	4.5%	15.9%	16.0%	19.0%	17.0%	12.2%
A3	0.2%	8.6%	10.8%	0.2%	0.2%	0.5%	1.2%	1.0%
BBB1	2.1%	1.9%	0.9%	1.0%	0.8%	1.1%	0.4%	0.7%
BBB2	0.2%	0.3%	0.7%	1.3%	1.6%	2.5%	5.1%	4.2%
BBB3	0.2%	0.2%	0.7%	2.1%	0.5%	0.1%	1.4%	1.1%
With collateral type:								
Auto loans	26.0%	16.1%	14.9%	13.4%	13.2%	11.0%	17.8%	16.7%
Credit card receivables	24.9%	36.2%	33.9%	32.8%	32.1%	40.5%	25.6%	15.4%
Utility company receivables	2.0%	1.0%	0.0%	2.6%	2.8%	3.9%	2.6%	1.6%
Home Equity Loans	11.2%	20.5%	30.5%	29.7%	31.1%	21.7%	36.4%	49.7%
Manufactured Housing Loans	35.9%	23.3%	18.2%	19.3%	19.3%	20.8%	13.4%	9.5%
Other	0.0%	2.9%	2.6%	2.2%	1.6%	2.0%	4.2%	7.2%

Notes: Durations and yields are computed only for fixed-rate securities. Proportions are unweighted.

TABLE 2: Sample Totals for ABS Composite Rating Changes

	Downgrades	Upgrades	Total
Security rating changes	819	473	1292
Issuer rating changes	615	436	1051
Sponsor rating changes	238	157	395
Number of notches:			
1	429	367	796
2	154	54	208
3	107	31	138
4	50	12	62
5	30	8	38
>5	49	1	50
Rating prior to upgrade or downgrade:			
AAA	167	0	167
AA1	40	13	53
AA2	73	29	102
AA3	121	59	180
A1	91	48	139
A2	171	91	262
A3	29	170	199
BBB1	48	17	65
BBB2	44	21	65
BBB3	35	25	60
Crossed investment grade threshold:	73	--	73
With collateral type:			
Auto loans	73	92	165
Credit card receivables	270	200	470
Utility company receivables	1	3	4
Home Equity Loans	65	85	150
Manufactured Housing Loans	343	80	423
Other	67	13	80
Occuring in:			
1997	148	13	161
1998	197	91	288
1999	105	247	352
2000	21	10	31
2001	4	34	38
2002	133	28	161
2003	211	50	261

Notes: Seventy-three "fallen angels" (securities whose ratings changed from investment grade to speculative grade) events are included in the set of downgrades. We identified 13 "rising devils" (rating change from speculative grade to investment grade), but they are not included in either our sample or in the totals above.

TABLE 3: Contemporaneous Excess Return Reactions to Credit Rating Changes (Percent)

	Security Downgrades	Security Upgrades	Issuer Downgrades	Issuer Upgrades
Mean Excess Return	-2.87 (0.00)	0.00 (0.95)	-1.57 (0.00)	-0.02 (0.77)
Median	-0.09	0.03	-0.06	0.03
% Positive	39.8% (0.00)	57.3% (0.00)	41.5% (0.00)	57.6% (0.00)
Observations	819	473	615	436

Note: Excess return is the security's total return less the full index's total return for each month. P-values appear in parentheses in the "Mean Excess Return" row for t-tests of the null hypothesis that the coefficient is zero. In the "% Positive" row, p-values appear in parentheses for likelihood ratio tests of the null hypothesis that the coefficient is 50%.

TABLE 4: Contemporaneous Yield Spread Reactions to Credit Rating Changes (Basis Points)

	All Downgrades	Downgrades within Investment Grade	Fallen Angels	All Upgrades
Mean Yield Spread Reaction	159 (0.00)	79 (0.00)	733 (0.00)	-5 (0.13)
1st Quartile	0	-1	29	-11
Median	19	15	421	-1
3rd Quartile	187	134	729	8
Observations	564	495	69	288

Note: P-values appear in parentheses for t-tests of the null hypothesis that the coefficient is zero.

TABLE 5: Determinants of Contemporaneous Excess Returns Reactions to Credit Rating Changes

	Security Downgrades		Security Upgrades	
Intercept	-2.87 (0.00)	-2.86 (0.00)	0.00 (0.95)	-0.05 (0.67)
Duration		-1.05 (0.00)		0.20 (0.01)
Initial Rating		0.35 (0.02)		0.07 (0.21)
Log Face Value		0.14 (0.77)		-0.34 (0.19)
# Rating Notches Change		-0.70 (0.00)		0.28 (0.01)
Fallen Angel		-9.95 (0.00)		
Manufactured Housing		0.14 (0.92)		0.73 (0.33)
Home Equity		3.64 (0.03)		0.93 (0.20)
Autos		-0.26 (0.86)		1.18 (0.13)
Credit Cards		0.27 (0.85)		1.87 (0.02)
Utilities		-1.21 (0.87)		2.52 (0.05)
Time Trend (Monthly)		-0.07 (0.00)		0.04 (0.00)
Adjusted R-Squared		0.38		0.13
Observations	819	620	473	308

Note: Right-hand-side variables measured as deviations from the sample mean. Excess return is the security's total return less the full index's total return for each month. P-values appear in parentheses for t-tests of the null hypothesis that the coefficient is zero.

TABLE 6: Average Excess Returns in Months Near Rating Change

	Same Month	1 Month Before	2 Months Before
All Downgrades	-2.87 (0.00)	-0.23 (0.16)	-0.83 (0.00)
Downgrades within Investment Grade	-1.42 (0.00)	-0.10 (0.33)	-0.65 (0.00)
Fallen Angels	-17.70 (0.00)	-1.53 (0.30)	-2.60 (0.16)
All Upgrades	0.00 (0.95)	-0.01 (0.86)	0.03 (0.83)

Note: Excess return is the security's total return less the full index's total return for each month. P-values appear in parentheses for t-tests of the null hypothesis that the coefficient is zero.

TABLE 7: Deviations from Estimated Rating-Specific Yield Curve Prior to Ratings Change (Annual Percentage Points at End of Previous Month)

	Downgrades		Upgrades	
	Prior Rating	**Future Rating**	**Prior Rating**	**Future Rating**
Mean Deviation (%)	0.18 (0.08)	-1.35 (0.00)	0.22 (0.05)	0.31 (0.01)
Average Rating Change (# notches)	-2.18		1.78	
Observations	201		97	

Notes: Yield curves fit by locally-weighted regression, using a linear local fit (d), a tricube weighting function (W), two iterations (t), and smoothing parameter 0.35 (f). See Cleveland (1979) for a discussion of the methodology and parameters. Smoothing parameter was adjusted in cases where there were there were fewer than 15 points with which to estimate the yield curve. Rating-categories where there were fewer than 5 points were excluded. Securities being upgraded or downgraded were excluded from the yield curve estimates. We estimate seperate yield curves for the home equity and manufactured housing collateral types. Especially in later years, these two collateral types tend to differ systematically from the rest of our sample. P-values appear in parentheses for t-tests of the null hypothesis that the coefficient is zero.

FIGURE 1: Average Monthly ABS Returns Around Credit Rating Downgrades

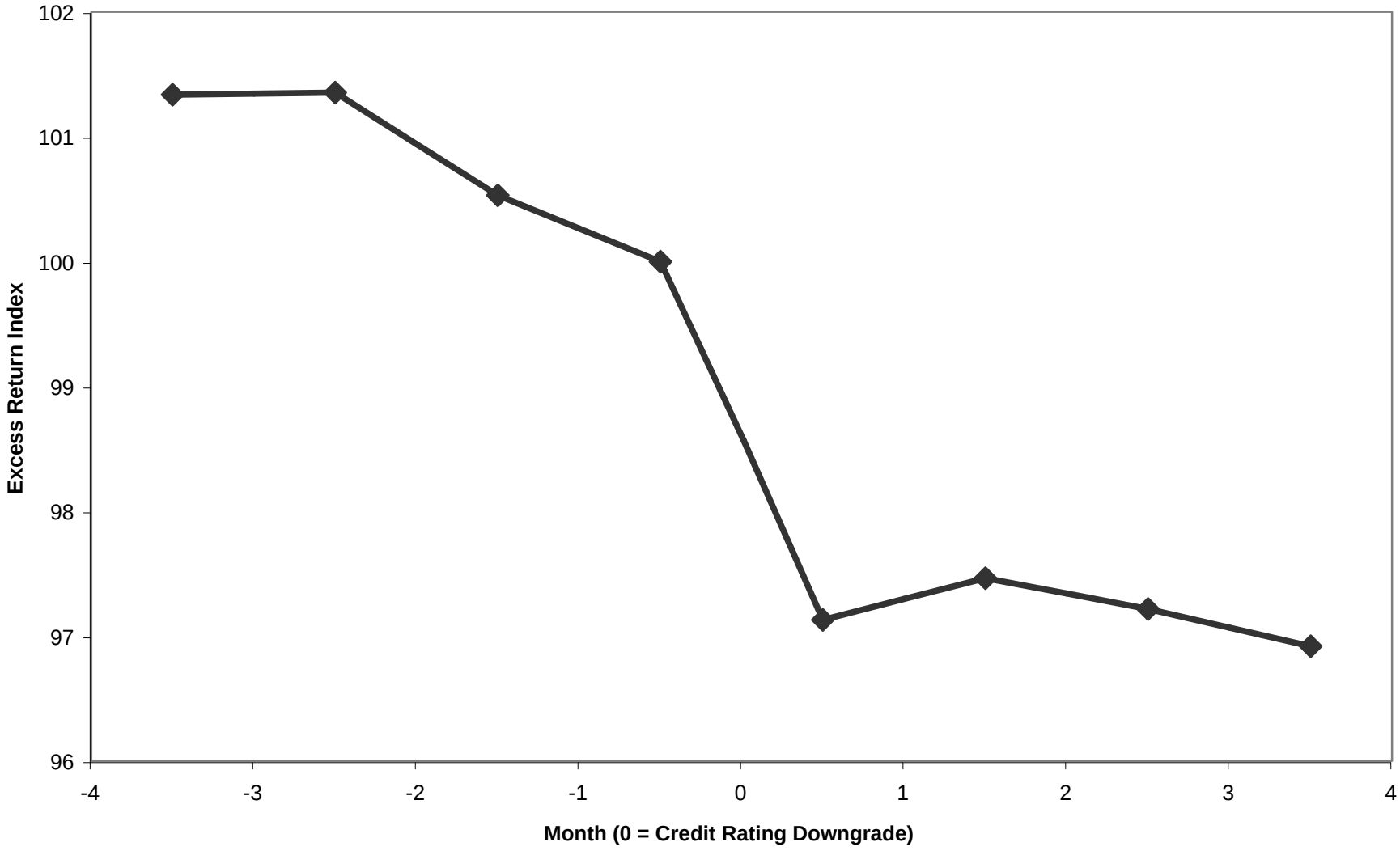

FIGURE 2: Average Monthly ABS Returns Around Credit Rating Upgrades

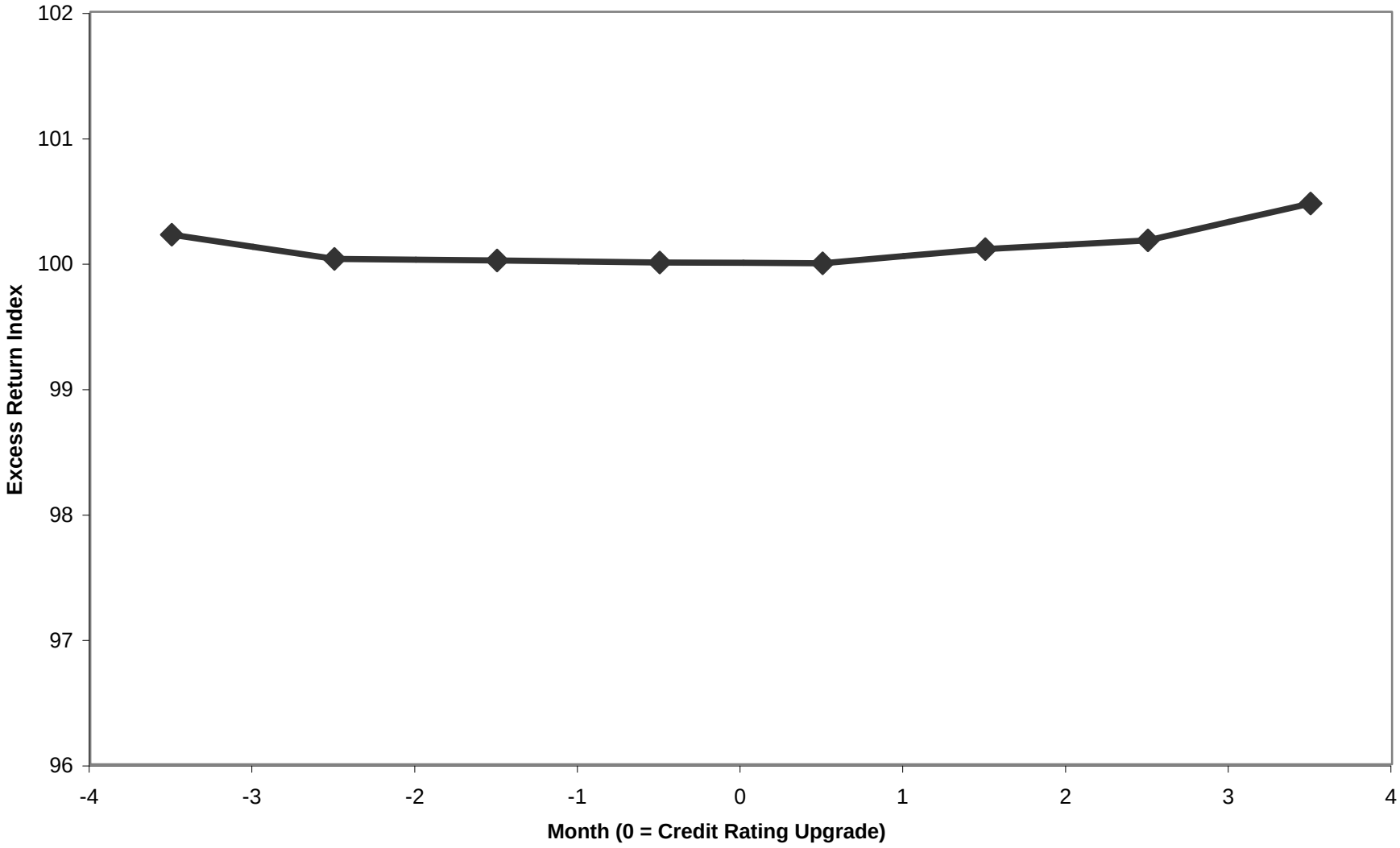

FIGURE 3: Two-Year Duration Yields (12/1996 - 12/2003)