Receivables Securitization

&

the Non-Financial Firm

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April 2009

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Abstract

Since the start of the financial crisis, various forms of securitization have been criticized for causing the problems experienced. The amount of Asset Backed Commercial Paper outstanding fell drastically in the middle of 2007 drawing our attention to this market. Our study focuses on the use of receivables securitization by non-financial firms, and we investigate who uses these programs, why they do so, and whether it adds any economic value. We carefully collect data from the 10-K filings of 242 users of securitization across the fiscal years 2006 and 2007, and combining it with accounting information from COMPUSTAT form powerful comparisons between users and non-users of receivables securitization We find that securitization appears to be most commonly utilized by those who are larger in size, have enough receivables to support a program, and who are restricted from accessing traditional credit markets due to high credit risk.. We find that the use of receivables securitization does add economic value through its ability, as a form of secured financing, to help firms overcome the agency problems caused by 'debt overhang'. It indicates that although financial firms were hurt by their use of ABCP programs, securitization can be useful to particular types of firms.

I. Introduction and Key Findings

       As we entered the economic crisis, Asset Backed Commercial Paper (ABCP) programs were one of the recent financial innovations that were accused of being among the sources of the problems plaguing the system. The ABCP market reached a peak of $1.2 trillion in mid-2007 before declining sharply as the crisis set in, thus drawing our attention to this form of secured financing, which is often used to move debt off the balance sheet. Our paper sheds a more positive light on a particular segment of the ABCP market – the support of receivables securitization programs by non-financial firms. As we consider who the users of receivables securitization are, and why they use it, we conclude that the decision to enter into a receivables securitization program is often strategic, and suited for firms that share certain risk, profitability, and investment related characteristics. Using an event study methodology, we document a positive valuation impact for a sample of firms entering a receivables securitization program, concluding that for the non-financial firms accessing the ABCP market using receivables securitization programs, such financing methods can indeed be beneficial.

       Receivables securitization is a form of secured borrowing whereby firms look to issue debt to investors which is backed by the cash flows derived from a pool of accounts receivable. Asset Backed Commercial Paper is often the debt of choice, as it is short term in nature, and thus matches the maturity of the assets in question. The use of Special Purpose Entities (SPEs), bankruptcy-remote subsidies that purchase the related receivables, allows financing decisions to be separated from investment decisions. As Myers (1977) explains, this minimizes some of the agency problems related to unsecured debt, as creditors' claim on the SPE is backed exclusively by the cash flows that they are entitled to from the accounts receivable. Therefore, firms can minimize suboptimal decision making due to 'debt overhang,' permitting more value increasing investment.

       We begin our analysis by identifying 119 and 123 firms using securitization in fiscal years 2006 and 2007 respectively. Compared to the universe of publicly traded firms, users of securitization are considerably larger, indicating the presence of economies of scale in the securitization process. After controlling for size and industry, we observe that users of securitization tend to have higher credit risk;

indicative of the 'debt overhang' problem, shown by significant differences across users and non-users in standard credit risk measures such as leverage (Debt/Assets ratio) and cash holdings (Cash/Assets ratio). Although they do not differ significantly on investment characteristics, they do tend to carry a higher proportion of receivables in their assets as compared to non-users. However, we do not find evidence to support our hypotheses of Users possessing greater growth prospects. The analyses show that securitization might not be for all firms, but is useful to those for whom access to traditional credit markets has been restricted.

Despite the large shock to the Asset Backed Commercial Paper market between 2006 and 2007, we find that non-financial users did not cut back or increase the amount of financing obtained through securitization programs. In fact, they showed little change in riskiness, profitability or investment behavior during fiscal year 2007. We believe that the drop in ABCP was therefore concentrated in programs backed by financial assets, which reportedly included a large share of mortgage related assets.

In order to quantify the economic importance of securitization programs, we perform an event study on the stock prices of a sample of 54 firms that report the date they entered into a receivables securitization program. We look at the monthly returns before and after the reported date, and relative to a few benchmarks, we find positive abnormal returns for securitization users. In the month of entry into the securitization program we find an average abnormal return of about 1%. In the one month preceding entrance into a program through to two months after we find a cumulative average abnormal return of about 5%. These findings indicate that there appears to be economic value to the use of receivables securitizations, especially when compared to the existing literature that tends to find negative abnormal returns around announcements of more traditional forms of financing.

Since traditional sources of accounting data for publicly traded firms (such as COMPUSTAT) do not provide information on their usage of securitization programs, we manually search footnotes of firms' 10-K filings to identify securitization users. We search through the 10-K filings for all non-financial, non-state-owned firms for the fiscal years 2006 and 2007, and having identified securitization users, we hand collect data on size of facility, usage of facility, and the accounting treatment. This results in 242 firm

year observations for users. Given these observations, we match each user with a non-user of similar size from the same industry. The sample on which we conduct our primary analyses includes 242 firm year observations for users, and 361 firm year observations for non-users spanning fiscal years 2006 and 2007. The detail provided from the hand-collected data permits us to identify the unique nature of securitization users and isolate the valuation impact, both of which would be impossible using aggregate data that is more easily available. Our contribution to the existing literature stems primarily from the comprehensive and careful data collection, permitting us to properly understand a recent and complicated financial innovation and the profile of firms who find it valuable.

The paper concludes that although entrance into a receivables securitization program does seem to have a positive valuation impact, reflecting the available benefits, not every firm would opt into such an agreement. Although the future of several types of securitizations is uncertain, our study indicates that ABCP programs backed by receivables securitization do provide economic value to non-financial firms. It acts as a viable source of funding for firms large enough to support the program, who are relatively risky and thus restricted from accessing traditional sources of credit.

Section II gives some background on the securitization process and the related accounting treatment. Section III outlines the hypotheses and the literature that motivated them. In section IV we give a detailed description of the data collection and the sample formation. The analyses comparing users and non-users appear in Section V. Finally, in Section VI we investigate the impact of the ABCP market drop, and examine the impact on market valuation of entering into a securitization program.

II. Background on Securitization

Securitization is a method of off-balance sheet financing used by firms in a number of industries, in varying forms. Securitization transactions vary in the type of asset securitized, the type and maturity of securities issued, as well as the complexity of the securitization structure.

The particular form of asset backed off-balance sheet financing we investigate is the Asset Backed Commercial Paper market. An Asset Backed Commercial Paper (ABCP) program involves a Special Purpose Entity established to fund a portfolio of assets through the issuance of commercial paper.

Commercial paper is a senior unsecured obligation generally issued by a corporation to provide working capital funding. Debt issued by ABCP programs tends to be short term in nature. Some common assets financed through ABCP programs include trade receivables, consumer debt receivables, auto and equipment loans and leases, and collateralized debt obligations. Financial firms account for about 80-90% of the ABCP outstanding. (The Fundamentals of Asset Backed Commercial Paper, Moody's Investor Service, 2003; Asset Backed Commercial Paper Explained, Fitch Ratings, 2001).

We see that the one common asset securitized across all industries (excluding financial firms) is trade receivables or accounts receivables. So as to ensure a large enough sample size, and similar characteristics of securitization used by firms across our sample, we focus our study on accounts receivable securitization. Receivables securitization often uses an ABCP conduit since the short-term nature of the Asset Backed Commercial Paper matches the maturity of the asset being securitized.

The securitization process (See Figure 1) involves pooling a set of receivables and then financing them through the sale of securities to investors. This is done with the creation of a bankruptcy remote Special Purpose Entity (SPE) (a legal entity that has been set up for a specific, limited purpose by another entity, known as the sponsoring firm (Gorton and Souleles, 2005)). Kennametal Inc.'s 10-K for Fiscal year 2006 described a bankruptcy remote subsidiary as being one that 'has been structured to make it highly unlikely that it will be drawn into a bankruptcy of the originator firm.

The originator typically has an agreement with an ABCP conduit to securitize receivables. The SPE purchases the receivables from the originator, and then sells an undivided interest in these receivables to the ABCP Conduit. The ABCP Conduit funds this purchase of receivables by issuing securities, i.e. Asset Backed Commercial Paper, to investors. The SPE is permitted to sell up to a particular amount of undivided interests to the ABCP conduit, and this amount can be revised and renegotiated from time to time.

The Originator might maintain a 'retained interest' in the receivables sold to the SPE. This retained interest is a form of credit support to the securities holder (Niu and Richardson, 2006), or a form of collateral supporting the securitization program. In this case the Originator would take a first loss

position on the receivables, absorbing the losses that might result in case some of the debtors default and are unable to pay the receivables that the SPE holds.

The securitization may then be recorded as a secured borrowing or a sale. Statement of Financial Accounting Standards (SFAS) No. 140 accounts for the transaction as a 'true sale' if there is a transfer of control. Returning to Figure 1, we can see the difference between the accounting for a true sale and a secured borrowing. If the transaction is accounted for as a true sale, the $100 in receivables is removed from the Balance Sheet, and replaced by Cash ($70) and retained interest ($30). Typically, the retained interest portion is pooled with the receivables on the Originator's balance sheet. Notice there is no debt recorded on the balance sheet.

Compare this to the accounting for a secured borrowing. While we still receive $70 in cash, $70 in debt is recorded as a liability. The receivables sold to the SPE remain on the balance sheet, and there is no retained interest portion.

All subsequent analysis adjusts the balance sheet of users so as to bring all off-balance sheet debt on balance sheet. In our example, we would add back $70 to the Assets ($100 sold - $30 retained interest), and add $70 of debt to the Liabilities.

Based on the collected sample of non-financial firms who securitize accounts receivables, we find that, on average, about one-fifth of their trade receivables were securitized in Fiscal Year (FY) 2006 and 2007. We also find that financing using receivables securitization represented almost one-sixth of their adjusted debt in FY 2006 and 2007. We find that firms use about half of the capacity available indicating that they still have the ability to increase borrowing under these programs.

Thus we see that receivables securitization is an important source of funds for non-financial firms who use it, and a substantial part of their trade receivables are entered into such agreements. The remainder of the paper explores the reasons why firms use the programs and the likely benefits that they receive.

III. Motivating Research and Hypotheses

Existing research in the field approaches the topic of securitization from a number of different viewpoints, and has been explored by accountants and financial economists alike. The literature reviewed helps frame our hypotheses and analyses.

Modigliani and Miller (1958) first propagated the idea that the value of the firm is not dependent on its capital structure, which motivated economists to investigate why capital structure and the method of financing used might in fact create value for a firm. We see that receivables securitization is unique in the sense that not only is it a form of secured borrowing, but is further enhanced by the fact that assets are held within a bankruptcy remote subsidiary to make them even secure. Therefore, we propose that receivables securitization should create some value for the firm.

Myers (1977) sets the groundwork for exploring the usefulness and benefit from the use of secured financing. Myers writes that unsecured debt is 'backed' by both the 'assets-in-place' as well as the 'real options' that represent future growth opportunities for a firm, and so tends to be riskier than secured debt. His paper shows that the problem of 'debt overhang' may occur in a situation where a firm's shareholders might not take on positive NPV investment opportunities if they are unable to raise funds for the project, due to its existing risky debt. This is due to the agency costs associated when investors consider lending to a company which already has high leverage. New creditors may be unwilling to finance new investment if part of the gains from it goes to existing creditors as well. Myers' paper suggests secured debt as a solution. Secured debt is that which is backed only by 'assets-in-place', and not the riskier 'real options' on growth and future investments, so as to mitigate this problem of suboptimal decision making.

Gorton and Souleles (2005), and Stone and Zissu (1997) give us an understanding of why securitization might be beneficial. Gorton and Souleles propose that off-balance sheet financing is most beneficial for riskier firms facing large bankruptcy costs, as there will be fewer assets held by the firm which would come under bankruptcy proceedings. Stone and Zissu present case studies explaining that

firms might seek to enter Asset Backed Commercial Paper programs in order to diversify their funding sources or to lower funding costs.

Given the fact that not all firms use receivables securitization suggests that it is not among the first financing options considered by a firm. Along with the studies mentioned, this fact informs our hypothesis that users of securitization are likely to have higher credit risk.

Stone and Zissu (1997) also mention the use of ABCP to support growth, which, we hypothesize, might be indicated by increased investment in Working Capital, Capital Expenditure, or Acquisitions. We then investigate whether differences in investment behavior drive the use of securitization. A number of 10-Ks we examined specified the use of securitization for purposes such as developing a new plant, making planned capital expenditure, or financing an acquisition.

Accounting papers on the issue have dealt with the question of whether securitizations are viewed by the market as being 'true sales' or simply secured borrowings. Niu and Richardson (2006) find that off-balance sheet debt related to securitizations has, on average, the same risk-relevance as on-balance sheet debt for explaining market measures of risk such as the CAPM beta. Similarly, Landsman, Peasnell, and Shakespeare (2006) find that overall the market views the SPE's assets as belonging to the sponsor or originator. Our paper approaches this issue from a different angle, and uses an event study methodology to examine whether there is a positive economic impact, or positive market valuation impact, of entering a receivables securitization program, as measured by stock price returns.

While Modigliani and Miller (1958) do suggest that capital structure does not determine firm value, we have seen that securitization can be used to overcome some of the costs associated with increased debt. We suggest that it is because of these benefits that users should experience an increase in market valuation following entry into a securitization program.

IV. Data

A. Construction

The two main sources of data for our paper are 10-K's of individual firms, obtained through a LexisNexis search, and accounting information from COMPUSTAT.

We begin by considering all the non-financial, non-state-owned firms available on the COMPUSTAT database in fiscal years 2006 and 2007. COMPUSTAT contains accounting information for all publicly traded firms. Initially we limit the sample based on the requirement of certain data items. We require that each firm-year have a COMPUSTAT data item for Total Assets, Total Liabilities, Debt in Current Liabilities, Long Term Debt EBIT, Sales, Market Value of Equity, Book Value of Equity. This leaves us with about 8500 firm-year observations.

Information about firms' use of securitization was not readily available. Therefore we had to examine each of their 10-K statements. We begin with a LexisNexis search of 10-K's from fiscal years 2006 and 2007 for the terms "special purpose entity", "off-balance sheet", "securitization", "undivided interest", and "purchase program" that appear within 100 characters of the word "receivables". Once again we excluded financial and state-owned firms from the search. We then read all the identified 10-K's to eliminate false positives, resulting in 242 firm-year observations for users of securitization across the fiscal years 2006 and 2007. While we cannot rule out the presence of false negative errors, we believe our search parameters were successful in finding most if not all the users of receivables securitization.

For example, a footnote from Hayes Lemmerz International Inc.'s 2006 10-K outlines their use of securitization.

> "On May 30, 2006, we established a new $65 million accounts receivable securitization facility with commercial lenders in the U.S. that replaced the program established on December 9, 2004"

> "Advances from lenders at January 31, 2007 and commercial paper conduits at January 31, 2006 were $37 million and $11 million, respectively. Our net retained interests at January 31, 2007 and January 31, 2006 were $43 million and $101 million."

> "The securitization transactions are accounted for as sales of the receivables under the provisions of SFAS 140 and are removed from the Consolidated Balance Sheets."

For each securitization user, we collect information about the size of the facility ($65 million), the facility usage ($37 million), the retained interest ($43 million), and whether the transaction is accounted for as a true sale or a secured borrowing (in this case, a sale).

B. Summary Statistics

The table below shows some summary statistics for firms using Securitization as compared to this broad sample of approximately 8500+ firm-year from the relevant SIC codes.

	Users	Non-Users
Assets ($000s)	10562	2509
Leverage (Debt/Assets)	0.311	0.222
Receivables(Trade)/Assets	0.158	0.148
Cash/Assets	0.058	0.129
Sales/Assets	0.124	0.121
N	242	8518

The table clearly shows that there is a marked difference in size between the average User and the average Non-User. The table below further explores this difference. We first sort all the firms in fiscal year 2006 into deciles based on their Total Assets. We then consider how many users of securitization exist within each decile. The table below indicates that Users are concentrated in the higher deciles. When forming our sample of comparable firms, we will look to control for size.

Asset Decile	Users
1	0
2	0
3	0
4	1
5	0
6	2
7	4
8	14
9	37
10	50

We also explore if firms are concentrated within particular industries. Table 1 indicates how users are distributed among the various industry groups represented by 2 digit SIC codes. We see that some industries don't have any users of securitization, while up to 21% of firms in certain industries use the program. Therefore we need to control for industry as well.

C. Forming a Control Group

We control for size and industry in the following manner.

- Consider Industry group with user.
- For each user, include in control group:
  - o Non-User with next highest asset size.
  - o Non-User with next lowed asset size.
- Repeat for every other user in every other Industry group

We obtain the sample below:

Final Sample	2006	2007	Average Asset Size ($000)
Users	119	123	10562
Non-Users	186	175	11483

We often find that once sorted by asset size, users tend to appear together. Therefore, we do not see exactly double the number of users to non-users for a given fiscal year. However, as can be seen from the Average Asset column, we obtain a control group similar in size to the Users.

Between 2006 and 2007, there is a net increase of 4 users, resulting from 11 firms that leave their securitization programs, and 15 firms that enter one in fiscal year 2007.

V. Who are the users of securitization?

Our first section of analyses considers why firms use securitization. We perform One-Way ANOVA analyses to form comparisons between the means of various metrics for Users and Non-Users. Three broad categories of metrics are considered as per our hypotheses.

A. Credit Risk

Table 2 indicates our analysis of credit risk and other debt related characteristics. From this first table we can see that the leverage is indeed about 5 percentage points higher for the Users in 2006 as compared to the Non-Users for the same fiscal year, and that this difference is statistically significant. The adjusted leverage is higher at the 1st and 3rd quartile level as well.

Similarly, we see that the Altman Z-Score[1] (1968) is significantly lower for the Users as well, which complements the results for leverage. The Altman Z-Score is a measure that aims to predict bankruptcy. At-least half the Users fall below the 'Safe Zone' threshold of 2.99, while it appears that at least 75% of the Non-Users are comfortably above this threshold. Although, on average the users of securitization are not predicted to go bankrupt, the significant difference in the means indicates that they are closer to bankruptcy than the non-users.

The analysis on Total Debt/EBITDA indicates that although the mean of the users is higher, this difference is not significant. However, if we account for the difference in cash held by considering the difference in the mean of Net Debt/EBITDA, we see that this difference is significant. These ratios indicate the firms' ability to pay off their debt. We use EBITDA since it functions as a proxy for Cash Flow. The numbers seem to indicate, that on average, Non-Users are more comfortably placed in terms of debt repayment ability.

The analyses above indicate that users of Securitization are typically more levered than comparable firms, are at a greater risk of bankruptcy and, adjusting for availability of cash, seem to be worse off than non-users in terms of debt burden as compared to profitability or cash flow. These results are in line with our hypothesis of Users having more credit risk which in turn lends weight to the argument that they use this financing to diversify their sources of funds.

B. Profitability

Next we consider the results from our comparisons of profitability and growth prospects, which appear in Table 2 as well. The Q ratio, (Total Market Value of Firm/ Total Assets), indicates how over or undervalued a firm might be on the market, by comparing its market value to the replacement value of its assets. A firm which the market believes to have high profitability and growth prospects is likely to have a higher market value compared to the replacement value of its assets, and therefore a higher Q ratio. Our

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[1] Altman's Z-Score is calculated as:

$$Z\ Score = 3.3\ \frac{EBIT}{Total\ Assets} + 0.99\ \frac{Sales}{Total\ Assets} + 1.4\ \frac{Retained\ Earnings}{Total\ Assets} + 1.2\ \frac{Working\ Capital}{Total\ Assets} + 0.6\ \frac{MV\ Equity}{Total\ Liabilities}$$

ANOVA analysis indicates that there is a statistically significant difference between the Q ratio of Users vs. Non-Users. The Non-Users have, on average, a Q ratio that is about 37% higher than that of the Users. Once again, we see that this contradicts our hypothesis that firms use securitization to fund growth. If proceeds of securitization were being used to fund projects, we would expect this to appear in the form of a higher market value for the Users.

We examine 3 different profitability measures to investigate whether there are any differences in the profitability of Users vs. Non-Users. We obtain statistical significance on all three comparisons which indicate that although the differences are about 2 to 3 percentage points on each metric, the users of securitization seem to be less profitable on average. We consider EBITDA over both Total Assets and Non-cash assets to control for size of the firm. The EBIT margin, which does not control for size, but gives us a better metric of operational efficiency, also indicates that Users are less profitable on average. This result is somewhat surprising, as we would expect not to see a difference between the Users and Non-Users especially since EBIT and EBITDA do not take capital structure into account.

C. Investment

Table 2 continues to show how users and non-users compare on investment related metrics. Firstly, we see that Users tend to have lower cash reserves, controlling for size. The difference in mean Cash/Assets ratio between the two groups is about 2.5 percentage points, and is statistically significant. Adjusting for the off-balance sheet receivables, we see that users of securitization have a Receivables/Asset ratio that is 5% more than that of Non-Users, with the difference indicated to be statistically significant. This might indicate that firms are indeed looking to use securitization as a means to gain liquidity and increase their cash holdings.

The results pertaining to investment contradict our hypothesis of Users having a higher amount of investment, relative to size. The data indicates similar amounts of capital expenditure, relative to size, and a slightly lower amount of acquisitions for Users. It might indicate that although some firms utilize securitization to fund acquisitions and raise capital expenditure, for others, the effect of a riskier capital structure, and potential debt overhang, might outweigh their willingness to use the additional funds to

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make investments. It is possible that these firms simply use the additional cash to boost liquidity, and maintain working capital.[2]

VI. Valuation Implications

The first part of our analysis on valuation implications considers the effects of the shock experienced in the ABCP market during Fiscal Year 2007. We do this by using a One-way ANOVA analysis focused on the users, comparing metrics determining facility sizes and usage from one year to the next.

Then, we closely investigate the market valuation implications of entering a receivables securitization program by using event study methodology.

A. Changes from 2006 to 2007

Within the years 2006 to 2007, we see a dramatic change in the market, as the amount of outstanding Asset Backed Commercial paper collapses (See Figure 2). The ABCP market consists of about 80 to 90% of financial firms (Moody's). We aim to understand whether the collapse in the market can be attributed to financial firms or whether non-financial firms contributed to the collapse as well. Given the drastic fall in the amount of ABCP outstanding, we would expect to see the firms in our sample cut back usage.

Given our sample of 108 firms that stayed with their securitization program from 2006 to 2007, we consider how their use of securitization changed from the years 2006 and 2007. A One-Way ANOVA analysis on the Facility Usage/Assets, Facility Usage/Debt, Facility Size/Assets, and Facility Size/Debt ratios indicates that there was no significant difference between the relative sizes or usages of their programs from one year to the next. Comparing the ratio Facility Usage/Facility Size for these firms from FY 2006 to FY 2007, we see that although the mean fell by about 2.5%, the difference does not appear to be statistically significant.

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[2] We performed a regression of the various investment metrics controlling for cash flow, cash, and growth prospects (Q ratio) with a dummy variable indicating the use or non-use of securitization. The dummy variable coefficients were insignificant for every investment metric.

We even compare a number of other metrics related to credit risk, investment and profitability across the two years. As can be seen from Tables 3 and 4 none of the averages come out to be significantly different between the two years. A number of the metrics move in the direction we would expect them to. For example, we see that the Altman Z-score decreases, leverage increases, and the Debt/EBITDA ratios increase as well. These changes would be expected at the start of an economic crisis, as we expect firms to perhaps decrease in profitability, and face liquidity issues and increase borrowing. However, the F-ratios suggest that none of these differences were significant, either for the Users, or for the comparable Non-Users for the two years.

It might be that the crisis had not manifested itself to the extent that the non-financial users might have been affected. An alternate explanation is that the collapse in the ABCP outstanding was a result of financial firms (which represent 80% to 90% of the market) cutting back drastically on usage as subprime mortgages started to go sour. This could be a plausible explanation, especially given it was the start of the crisis, and mortgages were the first assets to go bad.

B. Event Study Methodology

The earlier part of the analyses examined who uses receivables securitization, why, and what benefits they obtained from it. Now, we consider whether these benefits have economic value, and if they result in any positive market valuation implications. In order to examine this hypothesis we use an event study analysis, using the Eventus software (Cowen (2005)) provided by Wharton Research Data Services, which utilizes returns data from CRSP. The abnormal returns presented by the event study should reflect the positive, or negative, impact on the valuation of the Users, and lend some insight into the economic impact of entering a securitization program.

We examine the 10-Ks of our sample of 123 unique users of securitization in the fiscal years 2006 and 2007, checking if they report the date they entered a receivables securitization program. We find that about 54 of our sample actually report the month and year of their entry. We disregard firms who only report the day that they renew a program. This is because the agreements are typically one year long, and easily renewable. Therefore the market should simply regard this as the continuation of a program.

These dates are then defined as the event dates. However, when we perform the analysis, we see that Eventus leaves out 3 to 4 of these firms on the basis of insufficient data.

In order to calculate abnormal returns, we need a model that estimates a particular stock's monthly return. We use a single factor model with EGARCH(1,1) errors to capture the conditional variance from month to month, recognizing that there occurs a clumping of periods of high or low volatility. The single factor model with EGARCH(1,1) errors is:

$$R_{jt} = \alpha_j + \beta_j + \epsilon_{jt} \quad (1)$$

Conditional Variance is:

$$\log h_{jt} = \omega_j + \delta_j \log h_{jt-1} + \gamma_j |z_{jt-1}| + \emptyset_j z_{jt-1} \quad (2)$$

where $z_{jt} = \epsilon_{jt}/\sqrt{h_{jt}}$. The parameters for this model are estimated using MLE.

As a point of comparison, we also perform a test using a simple single-factor model which does not model conditional variance. This is represented simply by (1) and the parameters are estimated using OLS.

R_{jt} is the return on the jth stock in **month** t. The event date is considered to be t=0. The estimation period is t=[-7,36]. The market indices considered are the CRSP Equally Weighted and the CRSP Value Weighted Indices.

Abnormal return is calculated by:

$$A_{jt} = R_{jt} - (\alpha_j + \beta_j R_{mt}).$$

The abnormal return statistics returned by Eventus are the Average Abnormal Return (AAR) and the Cumulative Average Abnormal Return (CAAR).

$$AAR_{T_1,T_2} = \sum_{j=1}^{N} A_{jt} / N .$$

The AAR's are then aggregated across time periods to get the CAARs as follows:

$$CAAR_{T_1,T_2} = (\sum_{j=1}^{N} \sum_{t=T_1}^{T_2} A_{ji})/N \ .$$

We use a few different tests to estimate the significance of the AAR's and CAAR's returned by Eventus. For event studies using the EGARCH estimation method, we obtain the Generalized Sign test and the Time-Series Standard Deviation test statistics. The Generalized Sign test compares the proportion of firms that show abnormal returns over the estimation period to those that show abnormal returns over the test period. The Time-series Standard Deviation test uses a single estimate of the variance of AAR, and does not calculate a separate variance estimate for each firm. For tests involving OLS estimation, we also report the Patell Z test results.

We present abnormal returns on a monthly basis, as well as cumulative abnormal returns across a few different intervals. We consider intervals t= [-6,-2] to check that there weren't any abnormal returns in the months preceding the entry into the securitization program. We then look at the interval [-1, 1] to examine the market impact within a month of entering the program. The remaining intervals t= [-1, 2], [-1, 4], [-1, 6], [-1, 8] assesses whether the valuation impact is sustained over a period of time after the event date

C. Results

The graphs in Figures 3 and 4 indicate the CAAR's in the interval t = [-6, 9]. We calculate CAARs relative to both the CRSP Value Weighted and the CRSP Equal Weighted Market Indices.

From the graphs in Figure 3, we can see that there is some evidence of a valuation impact from these firms entering into a receivables securitization program. The effects manifest themselves more clearly if we consider the study that models EGARCH(1,1) errors.

The Unadjusted Raw Returns, as well as the CAARs against both the Value Weighted and the Equal Weighted Market Indices show an upward trend from t=0 onwards. Although monthly returns tend to be noisier, we are encouraged by the fact that the CAARs are relatively flat before t=0, and then rises for a few months before flattening out again. This is perhaps due to some inefficiency in the market that

manifests itself because of the fact that information regarding securitization might take time to disseminate. If users of securitization do not make immediate announcements regarding their entrance into a program, but delay publication until the time of filing a 10K/Q, we might see such an effect. This delay might also indicate that the economic effects of securitization take time to set in.

Tables 6 and 7 look closely at the average abnormal returns for each month in an interval of t = [-6, 6]. If we consider the EGARCH estimation event study we can see that we have an abnormal return of 2.29% at t=1 which is significant at the 0.10 level for both the CDA and the Generalized Sign test. We also see a significant abnormal return at t=3, which might or might not be related to the entrance into the securitization program. If we consider the monthly average abnormal returns against the Equal Weighted Market Index, we do see an abnormal return of 1.08% at time 0 significant at the 0.10 level on the Generalized Sign test. Once again however, we note significant abnormal returns even after t=1. Here too, we have an indication that the valuation or economic effects of the securitization might not be felt immediately, but set in over the course of a few months.

Table 5 indicates the Cumulative Average Abnormal Return over a range of intervals. We see that the CAAR is not significant in the [-6,-2] range for both the EGARCH estimation model, as well as the simple single factor model, which supports Figures 3 and 4. The tables also indicate substantial abnormal returns of upto 7.30% significant at the 0.05 level up to 6 months after the event. We can contrast the positive abnormal returns here with returns following the issuance of other forms of financing. Billett, Flannery and Garfinkel (2006) write that seasoned equity offerings see negative equity returns following the event, and bond issues result in zero to slightly negative equity returns

Therefore, the initial evidence suggests that entering a securitization program does have a positive impact on market value. This ties in well with some of the earlier theory discussed, especially Myer's (1977) viewpoint that the agency costs of 'debt overhang' could potentially be overcome by using secured debt. By securitizing receivables, the firm is obtaining secured financing backed by assets that have relatively more predictable cash flows, perhaps even obtaining a lower cost of funding. These results may

suggest that there is yet economic benefit to be had from receivables securitization, as signaled by the market reaction.

VII. Conclusion

Given this valuation impact, why does every firm not enter a securitization program? As our earlier investigation suggested, the users of securitization have certain characteristics, which might indicate that entry into a program is restricted by these factors. Firstly, a firm must generate enough receivables to make securitization a worthwhile source of funding. Not only must the firm have enough receivables to borrow against, but it would also require receivables to be pledged as collateral or retained interest. Additionally we have seen that users of receivables tend to be larger in size, which suggests that economies of scale might play into the decision to enter a program. The fact that Users tend to be more levered also indicates that a securitization program is a financing option considered only when the agency costs of debt issuance manifest themselves more fully. For these reasons, although securitization may be available at a lower cost, firms might be restricted from entering such programs.

While our results seem encouraging, we must make conclusions with some caution. It is important to realize that monthly data can be noisy, and there could be other unseen factors apart from entry into a securitization program that cause these abnormal returns in our event study. We also cannot overlook a potential bias in the reporting of the original date of entry into a receivables securitization program.

There are a few possible ways in which our study can be expanded. It would be interesting to consider how the stock prices of the users were affected during the crisis in 2007, and to consider whether they experienced negative abnormal returns. This would shed some light on the potential risks of using securitization. One might also look to collect data for Fiscal Year 2008, and see whether we see changes in usage as the financial crisis evolved over the next year.

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Figure 1: The Securitization Process

The diagrams below describe the securitization process. Cash moves from the Investors in the ABCP Conduit to the Originator firm to the Debtors. Receivables, and interest in the cash flows generated by them are passed on in the other directions. Eventually, the investors who purchase the Asset Backed Commercial Paper have a security that is backed by the Receivables, and payments to the ABCP holders is generated from the debtors paying the amounts due to the SPE, which now holds the asset.

Source: Niu, Richardson (2006)

Originator's initial balance sheet

Receivables	$200	Owner's equity	$200

Originator's balance sheet after transferring $100 of receivables to SPE

(sale accounting)

Receivables	$100		
Retained interest	$30		
Cash	$70	Owner's equity	$70
	$200		$200

Book debt-to-equity ratio: nil

Originator's balance sheet after transferring $100 of receivables to SPE

(secured borrowing accounting)

Receivables	$200	Debt	$70
		Owner's equity	$200
Cash	$70		
	$270		$270

Book debt-to-equity ratio: 70/200 = 35%

Debtors → Originator → SPE → ABCP conduit → Investors

Receivables

Receivables

Interest in receivables

ABCP

$ Retained interest and $ $

23

Figure 2: Asset Backed Commercial Paper Outstanding

The graph below shows the amount of commercial paper outstanding, with the yellow line indicating Asset Backed Commercial Paper. One of the questions this paper tries to answer, is whether there was a drastic change in the usage of receivables securitization by non-financial firms as the market collapsed, or was the collapse attributable to the 80% to 90% of financial firms who make up the ABCP market.

Source: Federal Reserve Website
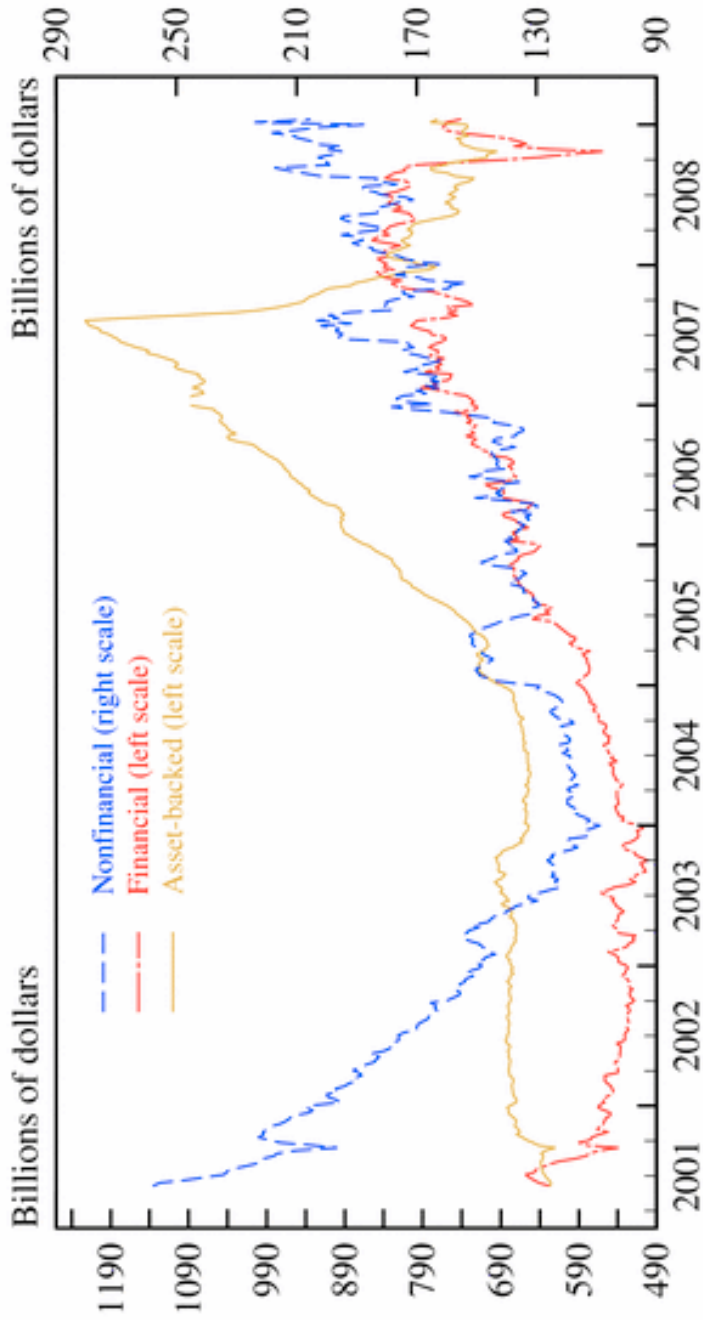
Figure 3: Cumulative Average Abnormal Returns for Single Factor Model with EGARCH(1,1) Errors

The first graph below shows the cumulative average abnormal return for the 51 firms that are part of the event study (See tables 7 and 8). The red line indicates the CAAR measured against the CRSP Equally Weighted Market Index, while the blue line indicates the CAAR measured against the CRSP Value Weighted Market Index. The second graph displays the unadjusted raw returns obtained for the event study.
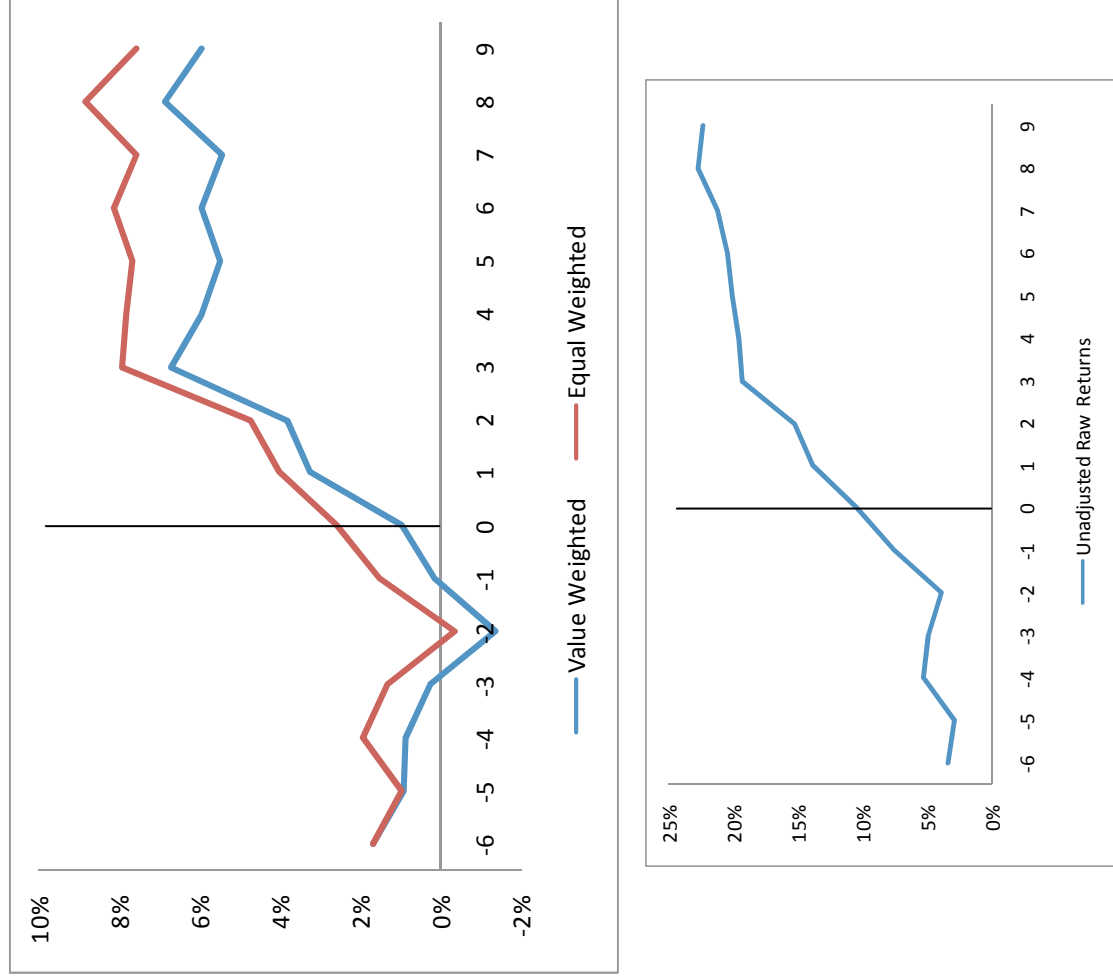
Figure 4: Cumulative Average Abnormal Returns for Simple Single Factor Model with OLS estimation

The first graph below shows the cumulative average abnormal return for the 51 firms that are part of the event study (See tables 7 and 9). The red line indicates the CAAR measured against the CRSP Equally Weighted Market Index, while the blue line indicates the CAAR measured against the CRSP Value Weighted Market Index. The second graph displays the unadjusted raw returns obtained for the event study.
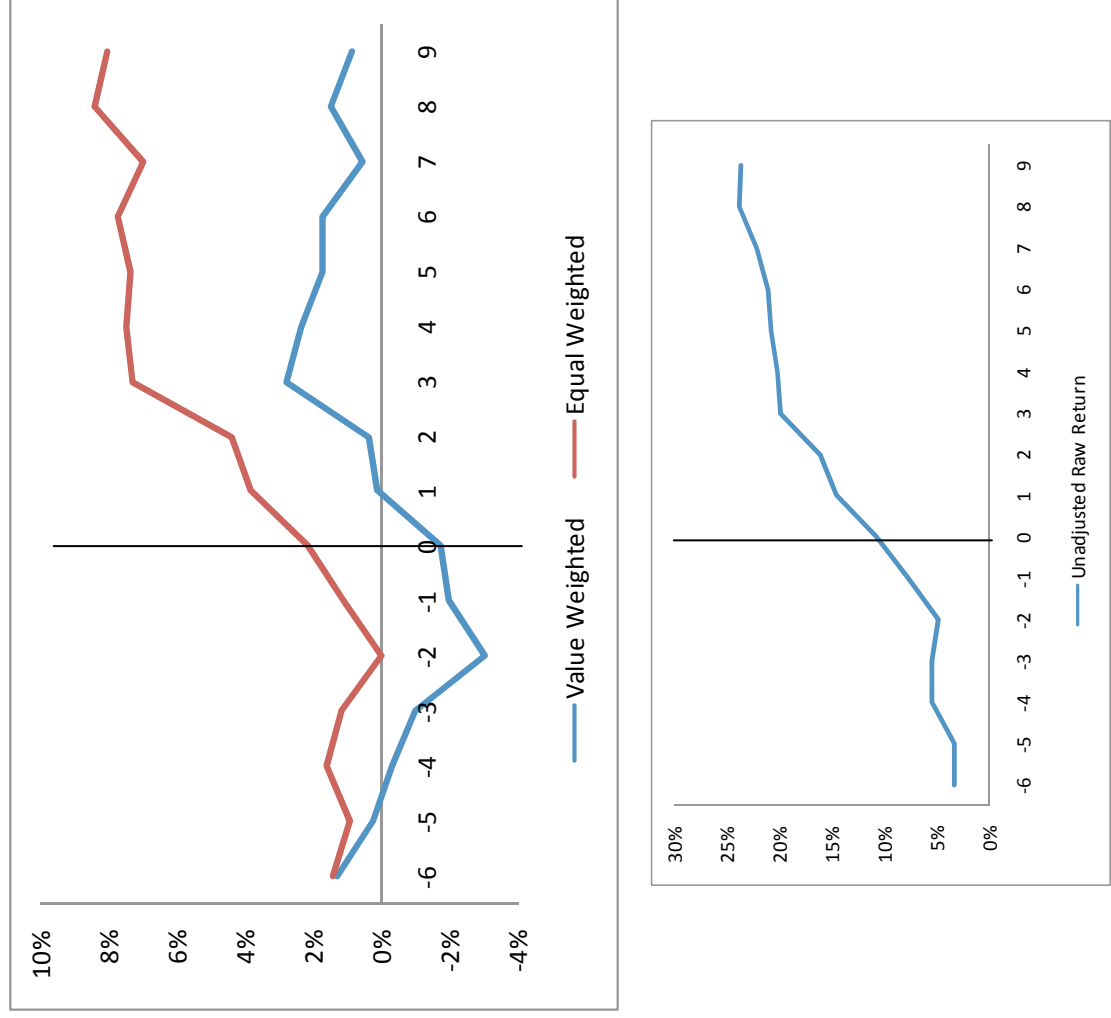
Table 1: Distribution of Securitization Users across industry groups

The table below indicates how Users and Non-Users are distributed across the various industries represented by 2 digit SIC codes.

| Industry	Users	Non-Users	% Users
Metal Mining		21	-
Coal Mining	3	9	33%
Oil And Gas Extraction		203	-
Nonmetallic Minerals, Except Fuels		9	-
General Building Contractors		26	-
Heavy Construction, Except Building		17	-
Special Trade Contractors		15	-
Food And Kindred Products	5	96	5%
Tobacco Products		6	-
Textile Mill Products	1	12	8%
Apparel And Other Textile Products		45	-
Lumber And Wood Products	1	17	6%
Furniture And Fixtures	1	23	4%
Paper And Allied Products	7	33	21%
Printing And Publishing	2	48	4%
Chemicals And Allied Products	9	516	2%
Petroleum And Coal Products	2	22	9%
Rubber And Misc. Plastics Products	3	44	7%
Leather And Leather Products		21	-
Stone, Clay, And Glass Products	1	21	5%
Primary Metal Industries	3	56	5%
Fabricated Metal Products	2	55	4%
Industrial Machinery And Equipment	7	259	3%
Electronic & Other Electric Equipment	8	430	2%
Transportation Equipment	10	97	10%
Instruments And Related Products	6	339	2%
Misc. Manufacturing Industries	1	41	2%
Railroad Transportation	1	7	14%
Local And Interurban Passenger Transit		3	-
Trucking And Warehousing	5	29	17%
Water Transportation		28	-
Transportation By Air		32	-
Pipelines, Except Natural Gas		7	-
Transportation Services		21	-
Communication	3	166	2%
Electric, Gas, And Sanitary Services	3	155	2%
Wholesale Trade - Durable Goods	11	101	11%
Wholesale Trade - Nondurable Goods	3	59	5%
Eating And Drinking Places		5	-
General Merchandise Stores		23	-
Food Stores	1	17	6%
Automotive Dealers & Service Stations	1	22	5%
Apparel And Accessory Stores		52	-
Furniture And Homefurnishings Stores		20	-
Eating And Drinking Places		75	-
Miscellaneous Retail	2	90	2%
Hotels And Other Lodging Places		14	-
Personal Services		16	-
Business Services	3	645	0%
Auto Repair, Services, And Parking		10	-
Miscellaneous Repair Services		1	-
Motion Pictures		26	-
Amusement & Recreation Services		58	-
Health Services	2	91	2%
Legal Services		1	-
Educational Services		23	-
Social Services		8	-
Engineering & Management Services	1	107	1%
Services, (Not Elsewhere Classified)		2	-

Table 2: Comparison between users and non-users of securitization

This table shows the results of the ANOVA analysis comparing the means of the Users and Non-Users during Fiscal Year 2006. We compare leverage and other debt related statistics to understand the difference between these groups and to understand the uses and benefits of securitization. All calculations performed for Users adjust assets and other balance sheet items 'as-if' all off-balance sheet financing is back on balance sheet. For some of the metrics, a few outlier points were excluded to obtain better estimates. The Difference column gives the absolute difference, while the F-ratio p-value gives us an idea of how significant this difference is. The Spread Column is calculated as (User Mean − Non-User Mean)/User SD, and gives us an indication of how separate the means are.

Metric	Users					Non Users					Difference	F-ratio	
	25th	Median	75th	Mean	SD	25th	Median	75th	Mean	SD		p-value	Spread
Credit Risk													
Leverage	0.188	0.294	0.400	**0.304**	0.150	0.119	0.229	0.359	**0.251**	0.169	0.054	0.0055	0.358
Altman's Z	1.990	2.570	3.740	**2.923**	1.744	2.170	3.240	4.970	**4.107**	3.744	-1.184	0.0016	0.679
Debt/EBITDA	1.440	2.480	4.020	**2.855**	2.248	0.780	1.620	3.350	**2.427**	3.454	0.428	0.2366	0.191
Net Debt/EBITDA	0.910	2.120	2.120	**2.383**	0.198	0.260	1.150	2.690	**1.600**	2.753	0.783	0.0096	3.964
Profitability													
Q	0.814	1.037	1.417	**1.169**	0.600	0.970	1.386	1.913	**1.601**	0.886	-0.432	<0.0001	0.720
EBITDA/Non-Cash Assets	0.094	0.126	0.153	**0.132**	0.058	0.096	0.144	0.198	**0.155**	0.090	-0.024	0.012	0.412
EBITDA/Assets	0.089	0.123	0.151	**0.124**	0.054	0.094	0.133	0.186	**0.142**	0.077	-0.018	0.031	0.326
EBIT Margin	0.041	0.081	0.118	**0.086**	0.007	0.059	0.103	0.160	**0.112**	0.006	-0.026	0.005	3.617
Investment Behaviour													
Cash/Assets	0.014	0.037	0.071	**0.051**	0.051	0.019	0.046	0.100	**0.078**	0.085	-0.026	0.0027	0.519
Trade Receivables/Assets	0.110	0.153	0.229	**0.192**	0.136	0.073	0.131	0.186	**0.142**	0.092	0.050	<0.0001	0.367
CapEx/Assets	0.019	0.033	0.048	**0.046**	0.053	0.023	0.040	0.058	**0.050**	0.046	-0.004	0.5334	0.068
Acquisitions/Assets	0.000	0.004	0.020	**0.028**	0.060	0.000	0.005	0.036	**0.039**	0.083	-0.011	0.2351	0.183
Working Capital/Assets	0.073	0.153	0.286	**0.192**	0.159	0.059	0.176	0.288	**0.183**	0.166	-0.009	0.6477	0.056

Table 3: Changes from 2006 to 2007 for Securitization Users

This table shows the results of the ANOVA analysis comparing the means of various metrics for FY 2006 and FY 2007. We compare metrics measuring leverage, ability to repay debt, investment, profitability, and facility usage. All calculations performed for Users adjust assets and other balance sheet items 'as-if' all off-balance sheet financing is back on balance sheet. For some of the metrics, a few outlier points were excluded to obtain better estimates. We perform the calculation on the 108 firms that stay in their securitization program from FY 2006 to 2007. The Difference column gives the absolute difference, while the F-ratio p-value gives us an idea of how significant this difference is. The Spread Column is calculated as (2006 Mean – 2007 Mean)/2006 SD, and gives us an indication of how separate the means are.

| Securitization Users | 2006 | | 2007 | | | F-ratio | |
Metric	Mean	SD	Mean	SD	Difference	p-value	Spread
Altman's Z	2.887	1.755	2.799	1.838	0.087	0.727	0.050
Leverage	0.309	0.151	0.327	0.161	-0.018	0.413	0.118
Net Debt/EBITDA	2.383	2.116	2.566	2.541	-0.183	0.552	0.087
Debt/EBITDA	2.925	2.407	3.036	2.682	-0.112	0.753	0.046
Cash/Assets	0.052	0.053	0.056	0.058	-0.005	0.548	0.087
CapEx/Assets	0.046	0.053	0.041	0.034	0.005	0.376	0.097
Acquisitions/Assets	0.028	0.060	0.030	0.056	-0.002	0.817	0.031
Receivables/Assets	0.196	0.013	0.187	0.013	0.010	0.611	0.720
Q	1.169	0.608	1.191	0.656	-0.022	0.796	0.037
EBITDA/ Assets	0.124	0.057	0.119	0.054	0.005	0.486	0.088
Facility Usage/Debt	0.151	0.217	0.151	0.226	0.000	0.991	0.002
Facility Usage/Assets	0.053	0.089	0.050	0.085	0.003	0.807	0.033
Facility Size/Debt	0.275	0.277	0.284	0.333	-0.009	0.842	0.033
Facility Size/Assets	0.084	0.104	0.082	0.106	0.002	0.909	0.017
Percentage of Facility Used	0.549	0.374	0.543	0.380	0.006	0.899	0.005

Table 4: Changes from 2006 to 2007 for Non-users

This table shows the results of the ANOVA analysis comparing the means of various metrics for FY 2006 and FY 2007. We compare metrics measuring leverage, ability to repay debt, investment, profitability, and facility usage. For some of the metrics, a few outlier points were excluded to obtain better estimates. We compare the means of each of our sets of comparable firms for FY and 2007. The Difference column gives the absolute difference, while the F-ratio p-value gives us an idea of how significant this difference is. The Spread Column is calculated as (2006 Mean − 2007 Mean)/2006 SD, and gives us an indication of how separate the means are.

Securitization Non-Users	2006		2007			F-ratio	
Metric	Mean	SD	Mean	SD	Difference	p-value	Spread
Altman's Z	4.072	3.763	3.485	2.533	0.587	0.0855	0.156
Leverage	0.251	0.169	0.286	0.211	-0.035	0.0783	0.209
Net Debt/EBITDA	1.600	2.753	2.060	5.399	-0.459	0.3439	0.167
Debt/EBITDA	2.427	3.454	2.710	7.787	-0.283	0.6538	0.082
Cash/Assets	0.078	0.085	0.075	0.079	0.003	0.7278	0.036
CapEx/Assets	0.050	0.046	0.047	0.039	0.003	0.5617	0.057
Acquisitions/Assets	0.039	0.083	0.059	0.127	-0.020	0.0907	0.238
Receivables/Assets	0.142	0.092	0.135	0.091	0.006	0.5061	0.070
Q	1.575	0.818	1.492	0.782	0.083	0.3274	0.102
EBITDA/Non-Cash Assets	0.137	0.090	0.133	0.082	0.004	0.6971	0.044

Table 5: Cumulative Average Abnormal Returns from Event Study

We performed event studies using Eventus (Cowen (2005)) for 54 firms who reported the date that they first entered into a securitization program. We produce estimations for each of our firms using both a single factor model and parameters estimated using OLS, or using a single factor model with EGARCH(1,1) errors with parameters estimated using MLE.

The tables below indicate the Cumulative Average Abnormal Returns for different sets of returns, using the different estimation methodologies. We focus on abnormal returns relative to the value weighted market index, as we have seen that users of securitization tend to be larger firms.

Shaded areas indicate statistics significant at the 0.10 level or below.

Single Factor Model with EGARCH(1,1) errors and MLE Parameter Estimation

Single Factor with EGARCH errors, Value Weighted Index

Months	Events	Mean Cumulative Abnormal Return	Positive: Negative	Portfolio Time-Series CDA t	Generalized Sign Z
(-6,-2)	50	-1.36%	24:26	-0.386	-0.256
(-1,+1)	50	4.63%	29:21	1.702*	1.159
(-1,+2)	50	5.21%	29:21	1.659*	1.159
(-1,+4)	50	7.30%	32:18>	1.899*	2.007*
(-1,+6)	50	7.30%	28:22	1.646*	0.876
(-1,+12)	50	4.40%	28:22	0.749	0.876

Single Factor Model with EGARCH(1,1) errors, Unadjusted Raw Returns

Months	N	Mean Cumulative Abnormal Return	Positive: Negative	Portfolio Time-Series CDA t	Generalized Sign Z
(-6,-2)	49	0.0399	28:21	1.126	0.687
(-1,+1)	49	9.96%	32:17>	3.633***	1.831*
(-1,+2)	49	11.43%	32:17>	3.610***	1.831*
(-1,+4)	49	15.68%	38:11>>>	4.044***	3.547***
(-1,+6)	49	16.50%	31:18)	3.687***	1.545$
(-1,+12)	49	17.90%	31:18)	3.023**	1.545$

The symbols $,*,**, and *** denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test. The symbols (,< or),> etc. correspond to $,* and show the significance and direction of the generalized sign test.

Single Factor Model with OLS Parameter Estimation

Single Factor Model, Value Weighted Index

Months	N	Mean Cumulative Abnormal Return	Precision Weighted CAAR	Positive: Negative	Patell Z	Portfolio Time-Series CDA t	Generalized Sign Z
(-6,-2)	51	-3.01%	-2.12%	24:27	-0.647	-0.893	-0.345
(-1,+1)	51	3.13%	1.48%	30:21)	0.581	1.197	1.336$
(-1,+2)	51	3.39%	1.86%	28:23	0.633	1.122	0.775
(-1,+4)	51	5.39%	4.52%	30:21)	1.253	1.460$	1.336$
(-1,+6)	51	4.79%	4.71%	29:22	1.131	1.123	1.055
(-1,+12)	51	-0.02%	3.79%	27:24	0.679	-0.003	0.495

Single Factor Model, Unadjusted Raw Errors

Months	N	Mean Cumulative Abnormal Return	Precision Weighted CAAR	Positive: Negative	Patell Z	Portfolio Time-Series CDA t	Generalized Sign Z
(-6,-2)	51	4.83%	5.25%	30:21	-0.647	-0.893	-0.345
(-1,+1)	51	9.67%	7.28%	34:17>	0.581	1.197	1.336$
(-1,+2)	51	11.24%	8.99%	34:17>	0.633	1.122	0.775
(-1,+4)	51	15.31%	14.04%	40:11>>>	1.253	1.460$	1.336$
(-1,+6)	51	16.30%	16.07%	33:18>	1.131	1.123	1.055
(-1,+12)	51	18.25%	15.66%	33:18>	0.679	-0.003	0.495

The symbols $,*,**, and *** denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test. The symbols (,< or),> etc. correspond to $,* and show the significance and direction of the generalized sign test.

Table 6: Single Factor with EGARCH(1,1) errors

We use a single factor EGARCH estimation model in order to calculate the Average Abnormal Return. The estimation period is t=[-7,36], with t=0 being the event date.

Unadjusted Raw Returns

Month	Events	AAR	Positive: Negative	Portfolio Time-Series CDA t	Generalized Sign Z
-6	49	3.45%	28:20	2.182*	0.687
-5	49	-0.47%	20:28(	-0.296	-1.601$
-4	49	2.42%	29:20	1.530$	0.973
-3	49	-0.43%	24:25	-0.271	-0.457
-2	49	-0.99%	24:25	-0.627	-0.457
-1	49	3.62%	29:20	2.289*	0.973
0	49	2.95%	30:18	1.862*	1.259
1	49	3.39%	32:17>	2.141*	1.831*
2	49	1.47%	27:22	0.928	0.401
3	49	3.95%	32:16>	2.494**	1.831*
4	49	0.30%	28:21	0.191	0.687
5	49	0.46%	27:22	0.293	0.401
6	49	0.36%	29:20	0.23	0.973

Value Weighted Market Index

Month	Events	AAR	Positive: Negative	Portfolio Time-Series CDA t	Generalized Sign Z
-6	50	1.68%	28:22	1.068	0.876
-5	50	-0.73%	17:33<	-0.463	-2.236*
-4	50	-0.04%	28:22	-0.27	0.876
-3	50	-0.61%	22:28	-0.388	-0.821
-2	50	-1.65%	23:27	-1.055	-0.539
-1	50	1.53%	24:26	0.975	-0.256
0	50	0.80%	26:24	0.511	0.31
1	50	2.29%	30:20)	1.462$	1.441$
2	50	0.58%	27:23	0.371	0.593
3	50	2.91%	31:19>	1.852*	1.724*
4	50	-0.81%	25:25	-0.519	0.027
5	50	-0.42%	26:24	-0.267	0.31
6	50	0.43%	28:22	0.272	0.876

Equal Weighted Market Index

Month	Events	Mean Abnormal Return	Positive: Negative	Portfolio Time-Series CDA t	Generalized Sign Z
-6	49	1.70%	25:24	1.234	0.462
-5	49	-0.74%	22:27	-0.54	-0.396
-4	49	0.99%	28:21)	17:12	1.320$
-3	49	-0.63%	21:28	-0.459	-0.682
-2	49	-1.67%	25:24	-1.216	0.462
-1	49	1.87%	27:22	1.356$	1.034
0	49	1.08%	28:21	18:44	1.320$
1	49	1.41%	27:22	0:31	1.034
2	49	0.73%	30:19>	0.534	1.892*
3	49	3.20%	33:16>>	2.327**	2.750**
4	49	-0.10%	28:21)	-0.075	1.320$
5	49	-0.16%	25:24	-0.118	0.462
6	49	0.44%	27:22	0.317	1.034

The symbols $,*,**, and *** denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test. The symbols (,< or),> etc. correspond to $,* and show the significance and direction of the generalized sign test.

Table 7: Single Factor Model with OLS Estimation

A single factor model was used in the calculation of the Average Abnormal Return. The estimation period is t = [-7,36] with t=0 being the event date.

Unadjusted Raw Returns

Month	Events	AAR	Positive: Negative	Patell Z	Portfolio Time-Series CDA t	Generalized Sign Z
-6	51	3.28%	29:21	1.911*	2.094*	0.67
-5	51	0.00%	22:28)	-0.335	0	-1.292$
-4	51	2.20%	30:21	1.417$	1.403$	0.951
-3	51	0.00%	26:25	-0.07	-0.003	-0.171
-2	51	-0.65%	25:26	-0.188	-0.415	-0.451
-1	51	2.93%	29:22	1.195	1.872*	0.67
0	51	3.02%	32:18)	1.793*	1.929*	1.511$
1	51	3.71%	34:17>	0.801	2.368**	2.072*
2	51	1.57%	28:23	0.89	1.004	0.39
3	51	3.74%	33:17>	1.692*	2.384**	1.792*
4	51	0.33%	29:22	0.941	0.211	0.67
5	51	0.63%	29:22	0.33	0.403	0.67
6	51	0.36%	30:21	0.725	0.229	0.951

Value Weighted Market Index

Month	Events	AAR	Positive: Negative	Patell Z	Portfolio Time-Series CDA t	Generalized Sign Z
-6	51	1.35%	28:23	0.849	0.892	0.775
-5	51	-1.08%	21:30	-1.18	-0.714	-1.185
-4	51	-0.58%	26:25	0.128	-0.386	0.215
-3	51	-0.65%	22:29	-0.309	-0.43	-0.905
-2	51	-2.05%	24:27	-0.935	-1.359$	-0.345
-1	51	1.06%	25:26	0.212	0.703	-0.065
0	51	0.25%	26:25	0.647	0.164	0.215
1	51	1.82%	29:22	0.147	1.206	1.055
2	51	0.26%	28:23	0.259	0.172	0.775
3	51	2.43%	31:20)	1.324$	1.611$	1.616$
4	51	-0.42%	27:24	0.48	-0.28	0.495
5	51	-0.62%	26:25	-0.272	-0.408	0.215
6	51	0.01%	25:26	0.402	0.009	-0.065

Equal Weighted Market Index

Month	Events	AAR	Positive: Negative	Patell Z	Portfolio Time-Series CDA t	Generalized Sign Z
-6	51	1.44%	25:26	1.17	1.083	0.024
-5	51	-0.53%	22:29	-0.893	-0.399	-0.816
-4	51	0.67%	27:24	0.761	0.5	0.584
-3	51	-0.39%	23:28	-0.256	-0.29	-0.536
-2	51	-1.20%	26:25	-0.373	-0.898	0.304
-1	51	1.12%	27:24	0.376	0.842	0.584
0	51	1.05%	30:21)	1.136	0.791	1.425$
1	51	1.68%	30:21)	0.063	1.258	1.425$
2	51	0.53%	31:20>	0.73	0.395	1.705*
3	51	2.89%	34:17>>	1.397$	2.172*	2.545**
4	51	0.19%	28:23	0.749	0.143	0.865
5	51	-0.13%	28:23	-0.049	-0.098	0.865
6	51	0.38%	27:24	0.916	0.282	0.584

The symbols $,*,**, and *** denote statistical significance at the 0.10, 0.05, 0.01 and 0.001 levels, respectively, using a 1-tail test. The symbols (,< or),> etc. correspond to $,* and show the significance and direction of the generalized sign test.