CMBS Special Servicers and Adverse Selection in Commercial Mortgage Markets: Theory and Evidence*

Brent W. Ambrose, Pennsylvania State University

Abdullah Yavas, Pennsylvania State University

Anthony B. Sanders, Arizona State University

January 31, 2008

Submitted to the Real Estate Research Institute

*The authors would like to thank Intex for the commercial loan data and Joseph L. Pagliari and Sally Gordon for helpful comments. Ambrose and Yavas acknowledge the support of the Real Estate Research Institute.

CMBS Special Servicers and Adverse Selection in Commercial Mortgage Markets: Theory and Evidence

Executive Summary

CMBS (Commercial Mortgage Backed Securities) are securities backed by pools of mortgage loans on commercial real estate properties. The primary attractiveness of the CMBS market is that it provides liquidity and diversification to commercial real estate investors and ready access to capital for commercial lenders.

CMBS are structured such that a master servicer oversees the administration of the underlying loans and the distribution of the cash flows to the tranche investors. One of these functions involves the administration and disposition of troubled loans. When a loan in a CMBS deal fails to perform as expected, the master servicer sends the loan to a "special servicer." The special servicer has wide latitude to foreclose on the loan or modify the loan terms in an effort to maximize the cash flows to the CMBS investors. Since the first-loss investors have the most at stake when a loan fails to perform, these investors often control the appointment of the special servicer. In fact, the special servicer often holds a portion of the first-loss piece in order to properly align the incentives of the investors and the special servicer. As such, the special servicer may not be concerned with the borrower's position, but rather may undertake actions (modification, foreclosure, etc.) that maximize the position of the first-loss investors.

We examine if the default risk for a pool is correlated to whether or not the master and special servicing rights of that pool are held by the same firm. We highlight the conflicting incentives of the master and special servicers in handling troubled loans and study how the frictions between the interests of the two servicers might be diminished if the master and special servicing rights are held by the same firm. We argue that the efficiencies created by the concentration of the two servicing rights in one firm will lead to faster handling of defaulted loans. This, in return, will enable a master servicer to bid more aggressively for a risky pool of loans if it expects to be the special servicer of that pool as well. Therefore, we expect a higher default rate for loans whose master and special servicing rights are held by the same firm.

We analyze the position of the master and special servicer with respect to loan default using a sample of over 59,000 commercial real estate loans from the INTEX CMBS database. The database contains loan information for a large number of CMBS deals and syndicators as well as originators. After cleaning the data and removing observations with implausible or missing observations, our sample contains 46,082 loans in 363 deals. We find that 40.8 percent of the loans are included in CMBS deals where the master and special servicing rights were held by the same firm. Regression analysis reveals that loans in the office, retail and industrial sector are more likely to have servicing rights concentrated in the same firm. Furthermore, we find that servicing rights are less likely to be concentrated with the same firm for loans with higher contract rates relative to the Treasury benchmark (higher net spreads) and for loans having prepayment protections.

Using a subset of 1,689 loans that defaulted during the study period, we find that the servicing rights were concentrated in one firm in 35 percent of the cases. Consistent with our theoretical expectation, we find that the time-in-default is shorter when the servicing rights are concentrated. We also find that loans with concentrated servicing rights are more likely to terminate in foreclosure. In fact, the hazard rate of foreclosure is 23 percent higher for loans with concentrated servicing rights. Finally, analysis of the probability of a loan going to default (60-day delinquency) is higher when master and special servicing rights are held by the same firm.

CMBS Special Servicers and Adverse Selection in Commercial Mortgage Markets: Theory and Evidence*

Brent W. Ambrose, Pennsylvania State University

Abdullah Yavas, Pennsylvania State University

Anthony B. Sanders, Arizona State University

January 31, 2008

*The authors would like to thank Intex for the commercial loan data and Joseph L. Pagliari and Sally Gordon for helpful comments. Ambrose and Yavas acknowledge the support of the Real Estate Research Institute.

CMBS Special Servicers and Adverse Selection in Commercial Mortgage Markets: Theory and Evidence

Abstract

Special servicers play an important role in reducing losses associated with troubled loans. One of these functions involves the administration and disposition of troubled loans. When a loan in a CMBS deal fails to perform as expected, the master servicer sends the loan to a "special servicer." The special servicer has wide latitude to foreclose on the loan or modify the loan terms in an effort to maximize the cash flows to the CMBS investors. Since the first-loss investors have the most at stake when a loan fails to perform, these investors often control the appointment of the special servicer. In fact, the special servicer often holds a portion of the first-loss piece in order to properly align the incentives of the investors and the special servicer. As such, the special servicer may not be concerned with the borrower's position, but rather may undertake actions (modification, foreclosure, etc.) that maximize the position of the first-loss investors. This paper offers theoretical arguments and empirical evidence for the possible correlation between the default risk for a pool and whether or not the master and special servicing rights of that pool are held by the same firm. We find that the default probability of a loan is higher if the master and special servicing rights of that loan are held by the same firm.

1. The Role of the Special Servicer

CMBS (Commercial Mortgage Backed Securities) are securities backed by pools of mortgage loans on commercial real estate properties. The commercial mortgage-backed security (CMBS) market has experienced rapid growth in recent years and is now the second largest source of credit for commercial real estate. The primary attractiveness of the CMBS market is that it provides liquidity and diversification to commercial real estate investors and ready access to capital for commercial lenders.

CMBS are structured such that a master servicer oversees the administration of the underlying loans and the distribution of the cash flows to the tranche investors. Often, the structure calls for sub-servicers to perform specialty functions. One of these functions involves the administration and disposition of troubled loans. When a loan in a CMBS deal fails to perform as expected, the master servicer sends the loan to a "special servicer." The special servicer has wide latitude to foreclose on the loan or modify the loan terms in an effort to maximize the cash flows to the CMBS investors. Typically, the special servicer's activities are detailed in a Pooling and Servicing Agreement (PSA).

Since the first-loss investors have the most at stake when a loan fails to perform, these investors often control the appointment of the special servicer. In fact, as Jacob and Fabozzi (2003) point out the special servicer often holds a portion of the first-loss piece in order to properly align the incentives of the investors and the special servicer. As such, the special servicer is not concerned with the borrower's position, but rather may undertake actions (modification, foreclosure, etc.) that maximize the position of the first-loss investor and guarantee the timely cash flow payments to the senior investor. This mechanism contrasts directly with the administration of troubled loans originated and

retained by traditional lenders. As such, if a loan does fail to perform as expected, the borrower may be able to negotiate an outcome other than foreclosure.

The purpose of this paper is to examine if the default risk for a pool is correlated to whether or not the master and special servicing rights of that pool are held by the same firm. We highlight the conflicting incentives of the master and special servicers in handling troubled loans and study how the frictions between the interests of the two servicers might be diminished if the master and special servicing rights are held by the same firm. We argue that the efficiencies created by the concentration of the two servicing rights in one firm will lead to faster handling of defaulted loans. This, in return, will enable a master servicer to bid more aggressively for a risky pool of loans if it expects to be the special servicer of that pool as well. Therefore, we expect a higher default rate for loans whose master and special servicing rights are held by the same firm.

Our empirical analysis provides support for our predictions. Using more than 46,000 securitized commercial real estate loans, we find that the time a loan remains in default is shorter when servicing rights are concentrated in one firm than when they are held by different firms. We also find a higher default rate for a loan if the two servicing rights are held by the same firm.

To our knowledge, the current study offers the first analysis of the correlation between the default probability and whether or not the two servicing rights are held by the same firm. In a closely related recent work, Gan and Mayer (2006) focus on a different aspect of the agency conflicts in managing troubled loans. They study the effectiveness of assigning the B-piece to the special servicer as an incentive mechanism. They find a smaller percentage of loans are transferred to special servicing and these

loans get liquidated more quickly when the special servicer owns the B-piece. However, special servicers delay liquidation when they hold the B-piece in mortgage pools with a larger percentage of delinquent loans. This is possible due to the fact, they argue, that the downside loss of such pools can be shared with senior piece holders. Thus, they conclude that assigning the B-piece to the special servicer alleviates agency conflicts only when delinquency rates in a pool are low. Other lines of related literature study default behavior and prepayment decisions without considering the agency conflicts in the servicing industry (examples include Deng, Quigley and Sanders, 2004; Ambrose and Sanders, 2003; and Chen and Deng, 2003), and issues associated with asymmetric information and moral hazard (see Fan, Ong, and Sing, 2006). Although not specifically concerned with the interactions of the master and special servicers, Fan, Ong, and Sing (2006) develop a general model showing how the "servicer" can reduce moral hazard problems associated with securitization. In general, their model assumes that servicer actions result from their desire to preserve their reputation capital. In contrast, our hypotheses developed in the next section are based on the assumption that the servicing firms engage in activities in order to maximize profits.

The next section of the paper discusses the incentive structure for master and special servicers and offers theoretical arguments for a positive correlation between the default risk for a pool and whether or not the master and special servicing rights of that pool are held by the same firm. We then utilize a sample of 46,082 securitized commercial real estate loans in 363 CMBS deals to provide an empirical test of our theoretical predictions.

2. Hypotheses Concerning Special Servicers

In this section of the paper, we present theoretical arguments for the possible correlation between the default risk for a pool and whether or not the master and special servicing rights of that pool are held by the same firm (or subsidiaries of the same firm). Jacob and Fabozzi (2003) propose a series of scenarios that outline the risks and possible conflicts arising from the first-loss security holder also controlling the servicing rights. For example, in dealing with borrower default resulting from balloon risk, Jacob and Fabozzi note that the first-loss holder may prefer that the servicer extend the mortgage term rather than seek a quick foreclosure if the property value is less than the mortgage balance. However, under this scenario the senior bond holders may prefer that the servicer quickly foreclose. In effect, the first-loss holder is hoping that the borrower will be able to recover in order to refinance the loan. Furthermore, since the servicer recovers any funds extended prior to repayment of the bond holders, a first-loss holder who also controls the servicing can take actions that may not maximize the value of the senior bond holder.

Two potential factors determine the correlation between the default risk of a pool and whether or not the special servicer and master servicer of the pool are the same. One is the moral hazard factor whereby the master servicer and special servicer may treat a loan differently depending on whether or not they are the same firm. The other is the adverse selection problem whereby the willingness of a master servicer to bid for a risky pool may depend on the probability that the master servicer expects to be the special servicer for that pool as well.

To understand the moral hazard and adverse selection problems, we first need to consider the compensation structure for the master and special servicers. Master servicers are typically compensated by a percentage of the outstanding balance of the loan plus the float. Float refers to the return that the master servicer earns on the monthly payments for the period between the date the master servicer receives the payment from the borrower and the date it passes the payment on to the investors.

The master servicer in a CMBS deal supervises the regular cash flows of the loans in the pool. The master servicer manages the flow of payments and information, handles the ongoing interaction with the performing borrower, and keeps track of the reserves, insurance and tax payments. In case of delinquency, the master servicer is responsible for advancing principal and interest through the foreclosure process to the extent it deems the advances are recoverable. The servicer can recover these advances, including the interest on these advances, from the proceeds of the sale of the property.

The Pooling and Servicing Agreement (PSA) specifies the conditions under which the master servicer forwards the underperforming loans to the special servicer. In practice, however, servicers have some discretion in deciding whether and when to transfer an underperforming loan to special servicing. The master servicer can also declare a loan in "imminent default" even though the loan might still be current. This could happen if, for instance, the master servicer discovers a significant decrease in the occupancy rate in the underlying property, in the cash flows from the property or in the collateral value of the property. The master servicer can also transfer the loan to the special servicer when the borrower is in violation of the covenants of the loan.

The special servicer's primary responsibility is to work out the loans forwarded by the master servicer. The contractual obligation of the special servicer is to maximize the interests of the investors. Clearly, the ideal solution would be for the special servicer to fix the problems with the loan and return the loan to performing status. If needed, however, the special servicer is authorized to foreclose on the property.

Special servicers are generally compensated by a percentage of the outstanding balance of the loans that they serve plus a fixed fee. Unlike the master servicer, the special servicer generates more profit if a particular loan goes into default.[1] This compensation structure could give incentives to the special servicer to prolong the workout or foreclosure process and to liquidate too few loans in order to collect more revenue in fees.[2] In order to better align the interests of the special servicer with those of the investors who own the underlying securities, special servicers sometimes hold the most junior piece of the deal, often referred to as the B-piece.

As stated earlier, moral hazard and adverse selection problems may exist with respect to the default risk of a pool and whether or not the same company performs the functions of master servicer and special servicer for that pool. Using the backward induction argument, we first consider the moral hazard problem before addressing the adverse selection issue. The reason for considering the moral hazard problem first is that the master servicer's willingness to bid for a pool and her bidding strategy will depend on

[1] The conflict of interest between the special servicer and the master servicer is exemplified in the following statements by a special servicer: "We get resistance from some master servicers for transferring the loans. This is understandable, as a master servicer has downside if it transfers the files too soon and the trust incurs special servicing fees. And there is no upside to transfer it earlier….The sooner we get our hands on a file and get in front of the borrower, the greater the recovery is going to be for the trust…We have a number of loans where K-mart is going to reject the lease, but the loan continues to perform. And the master servicer won't transfer the file. We want to be discussing the situation with the borrower – K-mart is leaving, what is your plan?" (Jones and Petosa, page 45).

[2] According to Ciochetti and Riddiough (1998), the foreclosure process takes about nine months.

her expectations about how the loans in the pool will be handled if they are transferred to the special servicer. Thus, the effort level of the special servicer as well as whether or not the same company is both the master and special servicer for the pool will impact the master servicer's bidding strategy for the pool.

The key moral hazard question for our study is whether or not the same company serving as both the master and special servicer has an advantage or disadvantage when dealing with underperforming loans. We argue that if the two servicers are the same, then they will communicate with each other more effectively, and as a result, the special servicer is more likely to find out about the underperforming loan earlier and have more effective recovery efforts. This leads to the following hypothesis:

> **Hypothesis 1:** If the master and special servicing rights are held by the same firm, then it is less likely for a defaulted loan to terminate in foreclosure. However, for loans that terminate in foreclosure, the time from delinquency to foreclosure is shorter.

The general proof of the above hypothesis relies on the fact that if the master and special servicing rights are held by the same firm, then this diminishes the frictions between the conflicting interests of the master and special servicers, and enables the firm to handle problem loans more efficiently. Since the master servicer (special servicer) has the option of not bidding for the special servicing rights (master servicing rights), then there must be some nonnegative efficiency gains in handling underperforming loans when the same firm holds both servicing rights.

As indicated above, the master servicer's interests lie in holding the loan as long as possible. Once the loan is transferred to the special servicer, the master servicer stops receiving any revenue from the loan and the special servicer starts collecting fees from

the loan. It follows, therefore, that the master servicer will be less resistant to send a loan to the special servicing if she is also acting as the special servicer for the loan. We expect a similar outcome with respect to master servicer's willingness to call performing loans. If the special servicing is handled by a different company, then it will be in the interests of the master servicer to delay calling a performing loan in order to collect fees and/or gain from the float for a longer period of time. However, if the master servicer is also the special servicer, then the master servicer is also concerned with how delaying the calling a performing loan could adversely impact the recovery process. As a result, the moral hazard component of the problem suggests that we should observe a higher probability of default for loans where the master and special servicer functions are held by the same firm.

To understand the adverse selection component, it is worth noting that when servicers bid for a pool in a CMBS deal, they receive a "flip book" that discloses property types (hospitality, office, retail, etc.) and loan amounts in the pool. Most servicers do a "re-underwriting" of a sample of loans to detect if there are any problems. The servicers, therefore, choose whether or not to bid for a pool, and how much to bid, depending on their assessment of the risk level of that pool. A potential determinant of the master servicer's bidding strategy is whether or not she also expects to obtain the special servicing rights for the pool. To illustrate the point, suppose that given the loan characteristics in a pool, each pool is either a high risk type or low risk type. The competing master servicers will all bid aggressively for the low risk type pools. This, on average, will result in equal probability for each servicer to win a low risk pool. For the high risk pools, a master servicer who also expects to be the special servicer for the pool

will bid more aggressively for, and is more likely to win, high risk pools than a master servicer who does not provide special servicing or does not expect to obtain the special servicing rights for that pool. Thus, the adverse selection component of the problem reinforces the impact of the moral hazard component:

> **Hypothesis 2:** The default probability of a loan is higher if the master and special servicing rights of that loan are held by the same firm.

3. Data

We collected a sample of over 59,000 securitized commercial real estate loans from the Intex CMBS database. As one of the leading providers of commercial real estate mortgage information, Intex gathers data from monthly servicing company remittance reports including loan specific data such as loan-to-value ratio (LTV), original balance, current balance, gross coupon, net coupon, debt service, amortization period, payoff, age, amortization type, frequency of payments, property type, location of underlying property, yield maintenance provisions, lockout period, ARM provisions, originators, syndicators and loan status. The Intex database contains loan information for a large number of CMBS deals and syndicators (such as DLJ, Deutsche Bank, GMAC and SASC) as well as originators (ContiFinancial, GMAC, and Confederation Life). After cleaning the data and removing observations with implausible or missing observations, our sample contains 46,082 loans in 363 deals.[3]

Table (1) provides the descriptive statistics for the loans in the sample. For example, we note that the average loan-to-value at origination was 68 percent and the

[3] We deleted observations with loan-to-value ratios less than 10 percent and greater than 150 percent, loans with balances reported as greater than $1 billion, loans with less than 2 months of performance history, and observations that did not include the name of the master servicer, special servicer or loan origination date.

average net coupon spread over the 10-year Treasury at origination was 224.6 basis points. Loans secured by multifamily and retail properties make up over half of the dataset accounting for 32.5 percent and 25.4 percent of the sample, respectively.

One of the interesting features of the Intex database is that it identifies the master and special servicer associated with each CMBS deal.[4] Thus, we are able to identify cases where the master and special servicing rights are held by the same firm based on a matching of firm names. Out of the 46,082 loans in our sample, we find that 40.8 percent (18,807) are included in CMBS deals where the master and special servicing rights were held by the same firm. Table (1) also reports the sample descriptive statistics based on whether the loans have the "same" servicer. Interestingly, we see that the average number of months where a yield maintenance penalty applies is greater for the same serivcer group (28 months) versus the different servicer group (25 months). However, loans with different servicers have longer prepayment lockout periods (60.4 months) than loans with the same servicer (42.9 months). In addition, the distribution of loans across property types is relatively similar for both servicer groups. Table (2) shows the distribution of loans by year of origination. The majority of the loans (53 percent) were originated between 1997 and 1999.

Since over 40 percent of the loans have the same firm serving as master and special servicer, we examined the loans that have differing servicer to determine how many of these loans are serviced by a firm that also performs one of the other functions. Panel A of Table (3) shows the distribution of loans based on whether the master servicer also performs special servicing functions for other loans in the dataset. For example, Panel A shows that of the 27,275 loans that have different master and special servicers,

[4] See Appendices (A) and (B) for a listing of the Master and Special Servicers.

25,673 (94.1 percent) had a master servicer that also performed special servicing function on other loans. In contrast, only 1,602 loans had a master servicer that did not also perform special servicing functions for other loans. Panel B of Table (3) reports the same analysis for special servicing firms. Here we see that 37.5 percent (10,231) of the 27,275 loans that had different servicing firms had a special servicer that also served as a master servicer on other loans. We also note that 17,044 loans had a special servicer that only performed special servicing functions for loans in the dataset.

Table (4) shows the results for the maximum likelihood estimation of the logit model for whether the master and special serivcing rights are held by the same firm. The results indicate that firms holding both master and special servicing rights prefer loans in the office, retail and industrial sectors. However, the negative coefficient on Hotel indicates that hotel loans are less likely to have servicing rights concentrated in one firm. The model also controls for factors associated with differences in underwriting and loan pricing. For example, the coefficient on the net interest rate spread (Netspread) indicates servicing rights are less likely to be concentrated with the same firm for loans with higher contract rates relative to the Treasury benchmark (higher net spreads). Furthermore, we also note that both variables capturing prepayment penalties (number of prepayment lockout months and yield maintenance penalties) show that the probability of servicing rights being held by the same firm is lower when prepayment protections are in place. These results confirm that when cash flows are more predictable (that is, have greater prepayment protection), the incentive to control both servicing functions is reduced.

4. Results

In section 2, we outlined the theoretical arguments regarding the relationship between servicing rights and loan risk. In this section, we empirically test these hypotheses by examining the default probabilities for CMBS loans. To reiterate, hypothesis 1 states that loans are less likely to end in foreclosure if the servicing rights are held by the same firm, conditional on the loan being in default. In addition, hypothesis 1 predicts that, conditional on ending in foreclosure, the time to foreclosure is shorter if the servicing rights are held by the same firm.

In order to test hypothesis 1, we focus on the subset of loans that are clearly classified as being in default – that is, being at least 90-days delinquent. After cleaning the data and removing loans with obvious data recording errors, we identified 1,689 (3.7 percent) loans as being in default. Of the loans that defaulted, we note that the master and special servicing rights were held by the same firm for 583 (35 percent) loans. Table 5 shows the mean number of months in default and the t-statistics testing for differences in mean across default outcomes. Focusing first on all loans, we see that the time-in-default of 13.5 months is significantly shorter (at the one percent level) when the servicing rights are held by the same firm than the 17.1 months for loans with different master and special servicers, which is consistent with hypothesis 1. Furthermore, looking across default outcomes, we find that the time in default remains consistently shorter when the servicing rights are concentrated in one firm than when they are held by different firms. For example, the mean time from default to foreclosure is 13.7 months when servicing rights are held by different firms versus 11.9 months for loans where the servicing rights are concentrated. Similarly, of those loans that defaulted and then were

modified or paid off, it took fewer months (12.4 months vs. 18.5 months) for a loan to be modified or paid off if the servicing rights are held by the same firm. Thus, the basic comparison of the across default outcomes confirms the second part of hypothesis 1.

Turning now to the probability that a loan in default will end in foreclosure, we first estimate a simple multinomial logit model of default outcome. As noted above, the possible outcomes for loans that enter default are foreclosure, modification/prepayment, or censored. We include as independent variables the loan-to-value ratio at origination, the loan interest rate spread over the 10-year Treasury (net-spread), the number of prepayment lock-out months, the number of months a yield maintenance penalty was in effect, dummy control variables for property type and origination year. Finally, the variable of interest in this model is samerservicer – a dummy variable indicating that the loan servicing rights were concentrated in one firm. We find that the probability of foreclosure is significantly positively related to the LTV ratio and interest rate spread as well as the presence of prepayment penalties.[5] The coefficient for sameservicer is positive and significant at the 1 percent level in the foreclosure model indicating that loans having concentrated servicing rights are more likely to terminate in foreclosure. However, consistent with the simple comparison of means reported in Table 5, the coefficient for sameservicer is not statistically significant in the loan modification model.

In table 7 we report the estimation results for a Competing Risks Hazard model of loan default. Following Ambrose and Sanders (2003), the model specifies the joint distribution of two variables: the duration of default, *t*, assumed to be a continuous

[5] One reason for the positive correlation between the presence of prepayment penalties and the probability of foreclosure is that higher risk borrowers are more likely to select loans with prepayment penalty (and lower interest rate) than lower risk borrowers. The reason is that higher risk borrowers are more likely to end up in foreclosure, in which case the prepayment penalty becomes irrelevant.

variable, and the method of terminating the default, r, which is an integer variable taking values in the set {1,2,3} representing foreclosure, modified/prepaid, or censored (still in default). Furthermore, we assume a latent duration, T_j, (j=1,2,3) that is the time required for the default to end via j method. Thus, the observed duration, t, is the minimum of the T_j. The benefit of this model is that it incorporates a time dimension to the model and allows for the introduction of time-varying coefficients. As discussed in Ambrose and Sanders (2003), the conditional probability of an outcome is

$$\Pr(r \mid t, x; \theta) = \frac{h_r(t \mid x_r; \theta)}{\sum_{j=1}^{3} h_j(t \mid x; \theta)}. \qquad (1.)$$

where x_j is a set of explanatory variables, θ_j are the estimated parameters, and h_j is the hazard function.

The matrix x_j includes a set of time-varying financial and economic characteristics as well as the static variables identified in the base model of default outcome (Table 6). Thus, we include the cumulative return to the property type from date of origination to termination (prepay, default or maturity) or end of period. As a proxy for the underlying property return, we use the CRSP/Zinman REIT property level monthly indices. We capture overall changes in property values by creating two dummy variables to denote whether the corresponding property level index return from loan origination to month t is greater than 25 percent (large_pos_pr(t)) or less than -25 percent (large_neg_pr(t)). By interacting these dummy variables with the sameservicer indicator variable, we see whether firms holding both the master and special servicer functions are able to selectively account for large property value changes. To capture the dynamics of the

mortgage prepayment option value, we also include a measure of the current yield curve (defined as the 10-year Treasury bond rate minus the 1-year Treasury bond rate) as a proxy for market expectations of future interest rates. As with Ambrose and Sanders (2003), we include a measure of the interest rate volatility, *GS10_VOL*, defined as the standard deviation of the 10-year Treasury rate measured over the previous 24 months. We also incorporate general changes in the default risk premium by including the spread between AAA and Baa rated corporate bonds (*SPREAD*) and the volatility of the spread (*SPD_VOL*).[6]

In terms of underwriting conditions at loan origination, we include a set of dummy variables controlling for the loan-to-value ratio at loan origination.[7] We also include the loan contract interest rate spread at origination, defined as the net coupon less the 10-year constant maturity treasury rate. Finally, we also include dummy variables to control for property type (hotel, office, multifamily, or retail with other being the holdout) and mortgage age (t, t^2, and t^3) to capture the impact of mortgage seasoning on the baseline hazard. We include the square and cubic function of mortgage age to capture any non-linearities associated with mortgage seasoning.

Focusing on the variable of interest, sameservicer, we again find that the hazard rate associated with foreclosure is significantly higher when the master and special servicing rights are held by the same firm. The estimated coefficient for sameservicer implies that the marginal effect of having the servicing rights concentrated in the same

[6] As with interest rate volatility, the credit spread volatility is measured as the standard deviation of the credit spread over the previous 24 months.

[7] For a theoretical discussion and detailed empirical analysis of loan-to-value ratio at origination and default probability, see Harrison, Noordewier and Yavas (2004). Archer, Elmer, Harrison and Ling (2002) offers empirical analysis of LTV and default for securitized multifamily mortgages.

firm raises the probability of foreclosure by 23.1 percent.[8] However, we also see that the sameservicer coefficient in the modified/prepaid model is insignificant, indicating that the effect of concentrating the servicing rights is minimal for this default outcome.

In section 2, we also outlined the theoretical arguments underlying hypothesis 2, which states that we should observe a higher probability of default for loans where the master and special servicing rights are held by the same firm. Thus, in order to test this hypothesis, we again estimate a full competing risks hazard model for mortgage termination. As discussed above, our empirical model is based on the mortgage termination model in Ambrose and Sanders (2003).

Table 8 shows the results from the maximum likelihood estimation of the competing risk model of mortgage termination. Since this is a full competing risk model of mortgage termination, the possible outcomes are default (60-day delinquency), prepayment, loan maturity, or censored (still current as of the end of the observation period). In order to be consistent with the analysis present above, we retain the same model specification as presented in Table 7.

Again, focusing on the variable of interest, sameservicer, we see that the estimated parameter is significantly positive in the default equation and significantly negative in the prepayment equation. The positive default parameter indicates that the odds of a loan going into default is 14.2 percent higher if the master and special servicer functions are held by the same firm.[9] Since default and prepayment are interrelated, the negative estimated coefficient in the prepayment equation indicates that the probability of a mortgage prepaying is 28 percent lower when the servicing functions are concentrated

[8] The marginal effect is defined as exp(β)-1. Thus, the marginal effect of sameservicer is 23.1 percent (exp(0.2081)-1).
[99] $e^{(.1329)}-1 = 0.142$.

in the same firm.[10] Thus, the results from our model confirm the predictions of hypothesis 2 – the default probability is higher when master and special servicing rights are held by the same firm.

5. Conclusions

The market for commercial backed securities has grown rapidly in recent years and has become the second largest source of financing for commercial real estate. Recent turmoil in mortgage markets has made it imperative to understand any source of inefficiencies and agency conflicts in the industry. In this paper, we examine the servicing part of the CMBS industry and highlight the conflicting incentives of the master and special servicers in handling troubled loans. In particular, we investigate how the frictions between the interests of the two servicers might be diminished if the master and special servicing rights are held by the same firm.

We show that concentrating both servicing rights in one firm leads to faster handling of default loans. Furthermore, consistent with master servicers being able to bid more aggressively for a risky pool of loans when the servicing rights are concentrated, we also find higher default rates for loans whose master and special servicing rights are held by the same firm.

[10] $e^{(-.3335)}-1 = -0.283$.

References

Ambrose, B.W., and A. Sanders. 2003. Commercial Mortgage Backed Securities: Prepayment and Default. *Journal of Real Estate Finance and Economics*, 26:2/3 175-192.

Archer, W. R., P. J. Elmer, D. M. Harrison and D. C. Ling (2002). Determinants of Multifamily Mortgage Default. *Real Estate Economics,* 30, 445-473.

Chen, J. and Y. Deng (2003). Commercial Mortgage Workout Strategy and Conditional Default Probability: Evidence from Special Serviced CMBS Loans. SSRN working paper.

Ciochetti, Brian A. and Timothy J. Riddiough (1998). Timing, Loss Recovery and Economic Performance of Foreclosed Commercial Mortgages. Working paper.

Deng, Y., J. M. Quigley, and A. B. Sanders. 2004. Commercial Mortgage Terminations: Evidence from CMBS. Working Paper, University of Southern California.

Fan, G.Z., S.E. Ong, and T.F. Sing. 2006. Moral Hazard, Effort Sensitivity and Compensation in Asset-Backed Securitization. *Journal of Real Estate Finance and Economics*, 32: 229-251.

Gan, Y. H. and C. Mayer. 2006. Agency Conflicts, Asset Substitution, and Securitization. NBER Working Paper 12359.

Harrison, D. M., T. G. Noordewier and A. Yavas. 2004. Do Riskier Borrowers Borrow More? *Real Estate Economics*, 32, 385-411.

Jacob, D.P. and F.J. Fabozzi. 2003. The Impact of Structuring on CMBS Class Performance. *The Journal of Portfolio Management* (Special Issue) 76-86.

Jones, R. and S. Petosa. 2003. A Rountable Discussion: Conflict of Interest Between Special Servicers and Investors. *CMBS World*, Summer 2003; 42-47.

Riddiough, T. J. 1997. Optimal Design and Governance of Asset-Backed Securities. *Journal of Financial Intermediation,* 6: 121-152.

Rothschild, M. and J.E. Stiglitz. 1976. Equilibrium in Competitive Insurance Markets: An Essay on the Economics of Imperfect Information. *The Quarterly Journal of Economics*, 90:4 630-49.

Posey, L. and A. Yavas. 2001. Adjustable and Fixed Rate Mortgages as a Screening Mechanism for Default Risk. *Journal of Urban Economics*, 49:1 54-79.

Table 1: Descriptive Statistics of Securitized Commercial Real Estate Loans

	All		Different Servicers		Same Servicers	
Number	46,082		27,275		18,807	
	Mean	Std Dev	Mean	Std Dev	Mean	Std Dev
OrigLtv	67.993	12.552	68.162	12.534	67.748	12.574
GrossCpn	8.040	1.050	8.018	1.075	8.073	1.012
gross_spread	2.370	0.793	2.367	0.811	2.372	0.766
NetCpn	7.917	1.006	7.913	1.036	7.922	0.961
net_spread	2.246	0.767	2.262	0.785	2.222	0.738
LockOutMos	53.248	50.302	60.353	50.292	42.943	48.502
YldMaintMos	26.391	43.920	25.111	41.569	28.247	47.060
PpayPtsMos	4.440	18.373	4.312	17.950	4.625	18.968
Office	0.143	0.351	0.141	0.348	0.147	0.354
Hotel	0.053	0.224	0.058	0.233	0.046	0.209
Industrial	0.094	0.291	0.086	0.280	0.105	0.306
Retail	0.254	0.436	0.262	0.440	0.243	0.429
Multifam	0.325	0.469	0.323	0.468	0.329	0.470

Notes: This table reports the descriptive statistics for the sample of commercial real estate loans contained in the INTEX database. The column labeled ``Different Servicers'' refers to loans where the master and special servicer are not the same firm. The column labeled ``Same Servicer'' refers to loans where the master and special servicer are the same entity. OrigLtv is the loan-to-value ratio at loan origination, netspread is the loan's coupon rate less the 10-year treasury rate at the date of origination, LockOutMos is the number of prepayment lockout months, YldMaintMos is the number of months a yield maintenance penalty is in effect. Office, Hotel, Industrial, Retail, and Multifam are dummy variables indicating whether the collateral underlying the loan is an office, hotel, industrial, retail or multifamily property.

Table 2: Distribution of Loans by Year of Origination

Origination Year	Different Servicers	Same Servicers	Total
1992	154	103	257
1993	370	237	607
1994	529	320	849
1995	1,376	648	2,024
1996	1,815	2,511	4,326
1997	4,416	2,449	6,865
1998	6,535	6,496	13,031
1999	3,401	1,908	5,309
2000	3,411	1,567	4,978
2001	3,195	2,071	5,266
2002	1,728	495	2,223
2003	990	269	1,259
Total	27,920	19,074	46,994

Table 3: Analysis of Servicing Firms

Panel A:Master Servicer also Serves as Special Servicer

	No	Yes	Total
Master and Special Servicer are Different	1602	25673	27275
Master and Special Servicer are Same	0	18807	18807
Total	1602	44480	46082

Panel B: Special Servicer also Serves as Master Servicer

	No	Yes	Total
Master and Special Servicer are Different	17044	10231	27275
Master and Special Servicer are Same	0	18807	18807
	17044	29038	46082

Note: This table shows the distribution of loans based on whether the loan servicer performs by master and special servicing functions. Panel A shows the distribution of loans based on whether its Master Servicer also serves as the Special Servicer for any loan in the dataset. Panel B reports the distribution of loans based on whether the Special servicer also serves as the Master servicer for any loan in the dataset.

Table 4: Probability of Loan Having Same Master and Special Servicer

Variable	Coefficient	Std Err	P-Value	Odds Ratio
Intercept	-0.6623	0.1306	<0.0001	
OrigLtv	-0.0001	0.0008	0.9245	1.000
netspread	-0.1028	0.0138	<0.0001	0.902
LockOutMos	-0.0126	0.0003	< 0.0001	0.988
YldMaintMos	-0.0032	0.0003	< 0.0001	0.997
Office	0.0932	0.0383	0.015	1.098
Hotel	-0.0705	0.0532	0.185	0.932
Industrial	0.1768	0.0425	< 0.0001	1.193
Retail	0.0821	0.0345	0.0172	1.086
Multifam	0.0192	0.0333	0.5648	1.019
orig1992	0.8071	0.1727	< 0.0001	2.241
orig1993	0.8409	0.1422	< 0.0001	2.318
orig1994	0.6776	0.1334	< 0.0001	1.969
orig1995	0.5749	0.1226	< 0.0001	1.777
orig1996	1.7207	0.1169	< 0.0001	5.589
orig1997	0.9272	0.1153	< 0.0001	2.527
orig1998	1.8579	0.1141	< 0.0001	6.411
orig1999	1.3905	0.1166	< 0.0001	4.017
orig2000	0.5417	0.116	< 0.0001	1.719
orig2001	0.7993	0.1155	< 0.0001	2.224
orig2002	-0.0634	0.1232	0.6066	0.939
-2*Log Likelihood	57835.798			
Likelihood Ratio Statistic	4482.4666		<0.0001	

Note: This table reports the maximum-likelihood parameter estimates for the logit model of whether the loan master and special servicer are the same firm. The dependent variable is a dummy variable equal to 1 if the master and special servicer are the same firm and 0 otherwise. OrigLtv is the loan-to-value ratio at loan origination, netspread is the loan's coupon rate less the 10-year treasury rate at the date of origination, LockOutMos is the number of prepayment lockout months, YldMaintMos is the number of months a yield maintenance penalty is in effect. Office, Hotel, Industrial, Retail, and Multifam are dummy variables indicating whether the collateral underlying the loan is an office, hotel, industrial, retail or multifamily property. The reference category is other. Finally, origXXXX are a set a dummy variables indicating the loan's year of origination. The reference year is 2003.

Table 5: T-test for differences in Mean Time to Default Outcome

			Default Outcome					
					Modified			
Servicer Status	All Loans		Foreclosed		/Paid-Off		Censored	
	N	Mean	N	Mean	N	Mean	N	Mean
Same	583	13.525	180	11.894	122	12.426	281	15.046
Different	1106	17.142	438	13.696	224	18.482	444	19.865
t-stat		4.71		1.87		3.47		3.62
p-value		0.0001		0.0615		0.0006		0.0003

Table 6: Multinomial Logit Model of Default Outcome

	Foreclosed				Modified / Prepaid			
Variable	**Parameter**	**Std Err**	**Chi-Sq**	**p-value**	**Parameter**	**Std Err**	**Chi-Sq**	**p-value**
Intercept	-1.0483	0.5286	3.9300	0.0474	-0.4135	0.5975	0.4800	0.4889
OrigLtv	-0.0040	0.0056	0.5100	0.4757	-0.0106	0.0062	2.9100	0.0883
net_spread	0.1914	0.0714	7.1800	0.0074	0.2583	0.0741	12.1500	0.0005
LockOutMos	0.0007	0.0012	0.3900	0.5349	-0.0079	0.0016	24.6600	<.0001
YldMaintMos	0.0044	0.0014	9.5200	0.0020	-0.0036	0.0018	4.1100	0.0425
time_in_default	-0.0222	0.0036	37.5200	<.0001	-0.0084	0.0039	4.6800	0.0306
sameservicer	0.2235	0.0619	13.0500	0.0003	0.1121	0.0726	2.3800	0.1228
Office	0.2430	0.1296	3.5200	0.0608	0.2814	0.1647	2.9200	0.0875
Hotel	0.0749	0.0998	0.5600	0.4532	0.1406	0.1240	1.2800	0.2571
Industrial	0.4473	0.1440	9.6500	0.0019	0.1586	0.1610	0.9700	0.3245
Retail	0.0023	0.0987	0.0000	0.9818	-0.0516	0.1182	0.1900	0.6623
Multifam	0.1971	0.1009	3.8200	0.0508	-0.1491	0.1127	1.7500	0.1858
Likelihood Ratio Statistic	3389.34			0.0713				

Note: This table reports the maximum-likelihood parameter estimates for the multinomial logit model of loan default outcome. The dependent variable equals 1 if the loan ended in foreclosure, equals 2 if the default ended in either a loan modification or prepayment and equals 3 if the loan is censored before the default is resolved, OrigLtv is the loan-to-value ratio at loan origination, netspread is the loan's coupon rate less the 10-year treasury rate at the date of origination, LockOutMos is the number of prepayment lockout months, YldMaintMos is the number of months a yield maintenance penalty is in effect. Sameservicer is a dummy variable indicating that the master and special servicing rights are held by the same firm. Office, Hotel, Industrial, Retail, and Multifam are dummy variables indicating whether the collateral underlying the loan is an office, hotel, industrial, retail or multifamily property. The reference category is censored loan outcomes.

Table 7: Hazard Analysis of Time-in-Default

	Foreclosure				Prepaid / Modified			
Variable	Parameter	Std Err	Chi-Sq	p-value	Parameter	Std Err	Chi-Sq	p-value
Intercept	-6.1385	0.5759	113.62	<.0001	-5.1734	0.7639	45.86	<.0001
Month (t)	0.1096	0.0176	38.64	<.0001	0.0352	0.0219	2.59	0.1076
Month (t^2)	-0.0055	0.0008	48.85	<.0001	-0.0025	0.0009	7.64	0.0057
Month (t^3)	5.7E-05	8.7E-06	42.18	<.0001	3.1E-05	9.6E-06	10.60	0.0011
Sameservicer	0.2081	0.1115	3.48	0.0620	0.1862	0.1693	1.21	0.2714
net_spread	0.0431	0.0503	0.73	0.3914	0.2284	0.0540	17.89	<.0001
yld_curve	0.2163	0.0694	9.72	0.0018	-0.0111	0.0978	0.01	0.9098
GS10_vol	1.5084	0.5704	6.99	0.0082	-1.2878	0.7522	2.93	0.0869
AAA_BAA_Spread	1.0781	0.3327	10.50	0.0012	0.4409	0.4672	0.89	0.3453
Spread_Vol	-0.8225	0.9250	0.79	0.3739	4.3970	1.3630	10.41	0.0013
sameservice*large_neg_pr	-0.0763	0.0934	0.67	0.4136	-0.1993	0.1445	1.90	0.1678
sameservice*large_pos_pr	-0.0077	0.0584	0.02	0.8946	-0.1323	0.0782	2.86	0.0909
ltv_80_90	0.1964	0.1049	3.50	0.0614	0.1363	0.1210	1.27	0.2600
ltv_90_95	-0.3682	0.2336	2.48	0.1150	-0.2316	0.3617	0.41	0.5219
ltv_95	-0.0589	0.1963	0.09	0.7640	-0.4100	0.1807	5.15	0.0233
Office	-0.0516	0.0982	0.28	0.5991	0.0929	0.1403	0.44	0.5079
Hotel	-0.0727	0.0703	1.07	0.3009	0.2199	0.1040	4.47	0.0345
Industrial	0.1263	0.1142	1.22	0.2685	-0.0082	0.1315	0.00	0.9503
Retail	-0.0624	0.0694	0.81	0.3682	0.0533	0.0932	0.33	0.5672
Multifam	0.0701	0.0742	0.89	0.3449	-0.1658	0.0876	3.59	0.0582
Loglikelihood Ratio	9156.62							

Note: This table reports the maximum-likelihood estimates of the Competing Risks Hazard Model of the time from loan origination to default, prepayment, or loan maturity. Month represents the loan age in months and specified as a third order polynomial to allow for nonparametric variation in the hazards. Sameservicer is a dummy variable indicating that the master and special servicing functions are held by the same firms (and 0 otherwise). Netspread is the loan's coupon rate less the 10-year treasury rate at the date of origination. Yld_curve(t) is the slope of the Treasury yield curve at month t (10-year constant maturity Treasury yield less the 1-year constant maturity Treasury yield). Large_neg_pr(t) is a dummy variable taking the value of 1 if the corresponding cumulative property index return from loan origination to month t is less than -0.5 and 0 otherwise. Large_pos_pr(t) is a dummy variable taking the value of 1

if the corresponding cumulative property index return from loan origination to month t is greater than 0.5 and 0 otherwise. The corresponding property index return is the return on the appropriate CRSP/Zinman REIT property type index. OrigLtv_80_90 is a dummy variable indicating that the loan-to-value ratio at loan origination is greater than or equal to 80 percent and less than 90 percent. OrigLtv_90_95 is a dummy variable indicating that the loan-to-value ratio at loan origination is greater than or equal to 90 percent and less than 95 percent. OrigLtv_95 is a dummy variable indicating that the loan-to-value ratio at loan origination is greater than or equal to 95 percent. The reference category is LTV ratios less than 80 percent. Office, Hotel, Industrial, Retail, and Multifam are dummy variables indicating whether the collateral underlying the loan is an office, hotel, industrial, retail or multifamily property. The reference category is other.

Table 8: Competing Risk Analysis of the Time to Default, Prepayment or Loan Maturity

	Default				Prepay				Maturity			
	Parameter	Std Err	Chi-Sq	P-value	Parameter	Std Err	Chi-Sq	P-value	Parameter	Std Err	Chi-Sq	P-value
Intercept	-9.3705	0.3093	917.70	<.0001	-385.2000	6.0408	4066.89	<.0001	-7.7770	0.2842	749.05	<.0001
Month (t)	0.1228	0.0084	216.50	<.0001	-0.0606	0.0073	69.93	<.0001	0.0130	0.0081	2.61	0.1060
Month (t^2)	-0.0019	0.0002	130.42	<.0001	0.0017	0.0001	216.78	<.0001	0.0006	0.0002	12.38	0.0004
Month (t^3)	9.1E-06	1.0E-06	81.75	<.0001	-7.6E-06	5.5E-07	193.58	<.0001	-3.9E-06	9.6E-07	16.66	<.0001
Sameservicer	0.1329	0.0400	11.01	0.0009	-0.3335	0.0730	20.88	<.0001	-0.1784	0.1330	1.80	0.1800
net_spread	0.4006	0.0219	336.17	<.0001	0.6707	0.0188	1279.17	<.0001	0.3427	0.0244	197.36	<.0001
yld_curve(t)	0.1728	0.0383	20.40	<.0001	-1.5867	0.1760	81.31	<.0001	-0.3991	0.0431	85.76	<.0001
AAA_BAA_Spread	0.1344	0.1938	0.48	0.4879	80.5791	1.3388	3622.69	<.0001	0.6962	0.2345	8.82	0.0030
Spread_vol	-1.5198	0.5240	8.41	0.0037	515.8000	8.9925	3289.66	<.0001	-3.8313	0.6368	36.20	<.0001
GS10_vol	-1.1176	0.2811	15.81	<.0001	324.7000	5.2472	3828.78	<.0001	-1.8666	0.3204	33.94	<.0001
sameservice*large_neg_pr(t)	-0.0085	0.0409	0.04	0.8359	0.4721	0.0780	36.63	<.0001	-0.1037	0.1342	0.60	0.4398
sameservice*large_pos_pr(t)	-0.0405	0.0256	2.50	0.1139	0.4511	0.0317	202.64	<.0001	0.0183	0.0297	0.38	0.5379
ltv_80_90	-0.0915	0.0513	3.18	0.0747	0.1939	0.0396	24.02	<.0001	-0.3487	0.0491	50.40	<.0001
ltv_90_95	0.0220	0.1516	0.02	0.8846	-0.3498	0.1107	9.99	0.0016	-0.7277	0.0964	56.98	<.0001
ltv_95	0.0722	0.1012	0.51	0.4757	-0.3925	0.0823	22.76	<.0001	-0.9653	0.0572	284.58	<.0001
Office	0.1103	0.0514	4.61	0.0318	0.0100	0.0316	0.10	0.7513	0.2350	0.0466	25.47	<.0001
Hotel	-0.7219	0.0412	307.04	<.0001	0.4625	0.0522	78.41	<.0001	0.6564	0.0928	50.06	<.0001
Industrial	0.1162	0.0564	4.25	0.0393	0.0370	0.0339	1.19	0.2750	0.2946	0.0506	33.91	<.0001
Retail	-0.1001	0.0404	6.15	0.0131	0.3152	0.0298	111.69	<.0001	0.5442	0.0447	148.43	<.0001
Multifam	0.0477	0.0406	1.38	0.2398	-0.2898	0.0254	130.13	<.0001	0.2363	0.0363	42.39	<.0001
Likelihood Ratio	70039.58											

Note: This table reports the maximum-likelihood estimates of the Competing Risks Hazard Model of the time from loan origination to default, prepayment, or loan maturity. Month represents the loan age in months and specified as a third order polynomial to allow for nonparametric variation in the hazards. Sameservicer is a dummy variable indicating that the master and special servicing functions are held by the same firms (and 0 otherwise). Netspread is the loan's coupon rate less the 10-year treasury rate at the date of origination. Yld_curve(t) is the slope of the Treasury yield curve at month t (10-year constant maturity Treasury yield less the 1-year constant maturity Treasury yield). Large_neg_pr(t) is a

dummy variable taking the value of 1 if the corresponding cumulative property index return from loan origination to month t is less than -0.5 and 0 otherwise. Large_pos_pr(t) is a dummy variable taking the value of 1 if the corresponding cumulative property index return from loan origination to month t is greater than 0.5 and 0 otherwise. The corresponding property index return is the return on the appropriate CRSP/Zinman REIT property type index. OrigLtv_80_90 is a dummy variable indicating that the loan-to-value ratio at loan origination is greater than or equal to 80 percent and less than 90 percent. OrigLtv_90_95 is a dummy variable indicating that the loan-to-value ratio at loan origination is greater than or equal to 90 percent and less than 95 percent. OrigLtv_95 is a dummy variable indicating that the loan-to-value ratio at loan origination is greater than or equal to 95 percent. The reference category is LTV ratios less than 80 percent. Office, Hotel, Industrial, Retail, and Multifam are dummy variables indicating whether the collateral underlying the loan is an office, hotel, industrial, retail or multifamily property. The reference category is other.

Appendix A: Master Servicing Firms

ALLIED CAPITAL CORPORATION
AMRESCO SERVICES
BANC ONE MORTGAGE CAPITAL MARKETS
BANK OF AMERICA
BANK UNITED OF TEXAS FSB
BANKERS TRUST COMPANY
BNY ASSET SOLUTIONS
CAPMARK SERVICES
CAPSTONE REALTY ADVISORS
CONNING ASSET MANAGEMENT COMPANY
CRIIMI MAE SERVICES
DYNEX COMMERCIAL
FIRST UNION NATIONAL BANK
GE CAPITAL LOAN SERVICES
GEMSA LOAN SERVICES
GESPA CDPQ
GMAC COMMERCIAL MORTGAGE CORP
HELLER FINANCIAL
HUDSON ADVISORS (ORIGINALLY BRAZOS ADVISORS)
KEY COMMERCIAL MORTGAGE
KEYCORP REAL ESTATE CAPITAL MARKETS
LUTHERAN BROTHERHOOD
MIDLAND LOAN SERVICES (ORIGINALLY BOATMENS NATIONAL MORTGAGE)
ORIX CAPITAL MARKETS
PACIFIC LIFE INSURANCE COMPANY
PMLS
PROTECTIVE LIFE INSURANCE COMPANY
PRUDENTIAL ASSET RESOURCES / WELLS FARGO BANK
SOUTHTRUST CAPITAL FUNDING
STARWOOD ASSET SERVICES
SUN LIFE ASSURANCE
WACHOVIA BANK
WASHINGTON MUTUAL BANK
WELLS FARGO BANK

Appendix B: Special Servicing Firms

AETNA LIFE INSURANCE
ALLIED CAPITAL CORPORATION
AMRESCO MANAGEMENT
ARCAP SPECIAL SERVICING
ARCHON GROUP
BANC ONE MORTGAGE CAPITAL MARKETS
BANK OF AMERICA
BEI MANAGEMENT
BNY ASSET SOLUTIONS
CAPMARK SERVICES
CIGNA INVESTMENTS
CLARION PARTNERS
CONNING ASSET MANAGEMENT COMPANY
CRICO MORTGAGE COMPANY
CRIIMI MAE
DYNEX COMMERCIAL
FIRST UNION NATIONAL BANK
FLEET REAL ESTATE CAPITAL
GE CAPITAL REALTY GROUP
GESPA CDPQ
GMAC COMMERCIAL MORTGAGE CORPORATION
HANFORD/HEALY ASSET MANAGEMENT COMPANY
HATFIELD PHILIPS
HUDSON ADVISORS CANADA INC.
JE ROBERT COMPANY
KEY COMMERCIAL MORTGAGE
KEYCORP REAL ESTATE CAPITAL MARKETS
LAURENTIAN BANK OF CANADA
LEND LEASE ASSET MANAGEMENT
LENNAR PARTNERS
LTC PROPERTIES
LUTHERAN BROTHERHOOD
MIDLAND LOAN SERVICES
NATIONAL HEALTH INVESTORS
OCWEN FEDERAL BANK / JE ROBERT COMPANY
ORIX REAL ESTATE CAPITAL MARKETS
PACIFIC LIFE INSURANCE COMPANY
PPM FINANCE
PRINCIPAL CAPITAL MANAGEMENT
PROTECTIVE LIFE INSURANCE COMPANY
PRUDENTIAL ASSET RESOURCES / ARCAP SPECIAL SERVICING
SL GREEN FUNDING LLC
SOUTHTRUST CAPITAL FUNDING
SUN LIFE ASSURANCE
WACHOVIA BANK
WASHINGTON MUTUAL BANK
WELLS FARGO BANK