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Commercial Mortgage Workout Strategy and Conditional Default Probability: Evidence from Special-serviced CMBS Loans

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During and after the crash of the commercial real estate market in the late 1980s and early 1990s, commercial mortgage default rates across the country were extremely high. Anecdotal evidence indicates that, since then, lenders have become much more cautious with these loans, tightening underwriting standards and stepping up servicing efforts. In addition, as these loans have been increasingly securitized, investors in commercial mortgage-backed securities (CMBS) now monitor the default risk and impose various requirements to limit default probabilities and potential loan losses. One such measure is to transfer a problem loan to a special servicer, because of his special expertise in handling these situations.

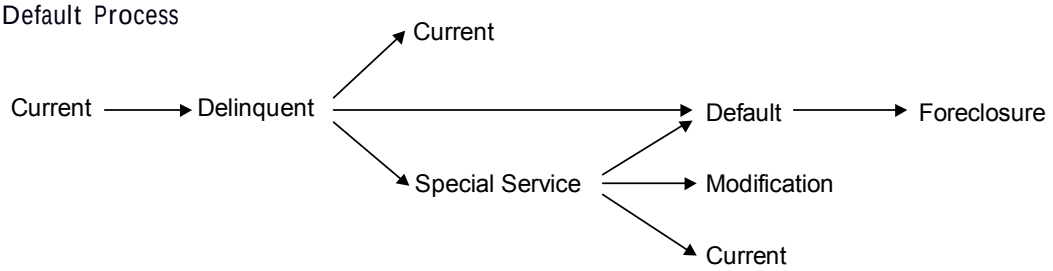
The triggers for transfers to the special servicer include delinquency, imminent default, borrower bankruptcy, litigation, and borrower forbearance requests, among others. Special servicers often have the power to decide the most effective workout strategy (e.g., whether to modify the loan term, to cure the delinquency, or to foreclose the property). In theory, the ultimate goal is to maximize the expected net present value of the problem loans. Because special servicers usually possess more expertise and devote more resources to managing delinquent loans, they charge much higher fees than regular servicers. In addition, using special servicers involves a potential moral hazard problem: special servicers may act in their own self-interest rather than in the interests of CMBS investors (Fathe-Aazam 1995 and Riddiough 2000). The effectiveness of special servicers in managing delinquent loans has a significant impact on the collateral performance and consequently on the pricing of CMBS tranches, especially the lower-rated first-loss pieces.

This study concerns the performance of the loans that are special-serviced, with a particular focus on clarifying the distinction between the servicers' behavior and the borrowers' behavior. We first study the decision making process from the servicers' perspective, and then turn to factors influencing loan defaults when they are special-serviced. We construe the latter as largely the borrowers' decision because few servicers would favor defaults. The link between the servicers' behavior and the borrowers' behavior is also established through a two-stage Heckman style estimation approach. Simulations of our empirically derived model show how it can be applied in the valuation and pricing of special-serviced loans.

Default Process

Figure 1 depicts the stages of the default process. Note that, although a loan is delinquent if just one scheduled payment is missed, this is not usually sufficient to transfer the loan to a special servicer. Rather, since default is generally considered as the exercise of the implicit put option embedded in the mortgage contracts,[1] the initial delinquency can be viewed as the borrower's tentative step to exercise the put option; we say "tentative" because it is easy to make up one missed monthly payment. Missing two scheduled payments, however, can trigger the transfer to the special servicer, because it usually indicates that the missed payments are not inadvertent mistakes but rather deliberately intended by the borrower. The special servicer then decides the best workout

Figure 1. The Default Process



strategy, while the borrower continues to re-evaluate the financial situation. We define 90 days past due as default because this status shows the borrower's determination to exercise his put option.

The process from delinquent to special service to workout outcomes depends on the behavior of both special servicers and borrowers. The special servicer examines the financial condition of the collateral, market conditions, the borrower's own financial situation, and other relevant factors, and then decides the best workout strategy, which we call the "expected" outcome. The major categories of "expected" outcome include foreclosure, modification, and return to current. If the servicers expect the borrowers to be delinquent for a prolonged period, foreclosure is usually the best strategy. The actual outcome, of course, depends on the borrower's behavior. We expect borrowers would still follow the rules of default put option when they are being special-serviced. In fact, the borrowers could be more ruthless at this stage because they have already shown a willingness to exercise the put option. Of course, cash flow conditions may still play a critical role, as found by some other studies. A rational borrower would be hesitant to complete the exercise of put option if there is still positive cash flow from the collateral, while negative equity is the necessary condition for the borrower's final completion of exercising default put option.

Data

The special service loan data are from Standard & Poor's Conquest CMBS deal library. The data collection date ends in September 2002, with loan status recorded as of August 2002. We searched 144 CMBS deals, most of which are conduit deals. We exclude loans that are either cross-collateralized or backed up by the same borrower, or loans with missing data. In order to perform the Heckman-style two-step analysis to study the potential correlation between special servicers' behavior and borrowers' behavior, we further collected the data of the performing loans from the same 144 CMBS deals. After excluding the records with missing data and cross-collateralized loans, we retain a total of 13,132 loans for the first stage estimation.

Real estate market data include occupancy rates for the hotel sector and vacancy rates for the remaining property types. In addition, NCREIF Property Indices are used to proxy for the market-level value indices and NOI indices.

Lenders' Workout Strategy

We identified 217 special-serviced loans with three clearly identified workout strategies: 52 were to return to "current" status, 47 were to be foreclosed, and the remaining 118 were to have the loan terms modified. The workout strategy j is chosen whenever the servicers expect the lowest future loss severity conditional upon that strategy. Although the expected loss severity function is unobservable, we do observe the choices servicers made under varying conditions, and these choices directly reflect the least loss severity expectations for the servicers.

The empirical results indicate a strong negative association between market NOI growth rates and foreclosure strategy. The order of choices affected by market NOI growth rates on the servicers' workout strategy is also confirmed. All else equal, in a market where rents are increasing (NOI growth rate is positive), servicers prefer to bring the loans back to "current" and are least likely to foreclose. The empirical results also indicate a significant positive association between loan age and the servicers' choice of loan term modification strategy. Servicers do seem to be more tolerant of borrowers who have performed well for a long period.

We find a significant positive impact of judicial foreclosure law on servicers' choice of foreclosure strategy. This seems puzzling at first glance; because judicial foreclosure is more costly than power-of-sale, one might expect servicers not to prefer foreclosure in the states where judicial foreclosure is required. However, as suggested by Riddiough and Wyatt (1994a) (1994b), servicers may not want to reveal their unwillingness to foreclose in these states because doing so would encourage more defaults. Actually, the statistical results show that servicers may purposely become tougher in states with judicial foreclosure laws in order to discourage future defaults.

Default Probability of Special-serviced Loans

We apply the Cox proportional hazards model to analyze the probability that a mortgage with certain characteristics will go from being current to default in a given period, which is called the conditional probability of default. Cumulative default probability can then be easily computed from the conditional default rate.

The empirical estimation results indicate that a borrower is very likely to make his payment decision based largely upon his equity position in the mortgage and the potential cash flow condition as indicated by the current space market movement. The borrower also looks at the space market vacancy (occupancy) movement to aid his estimation of potential cash flows from the collateral. State foreclosure laws do not seem to have a significant impact on the borrower's default process. In addition, the results from the fully specified model find evidence of loans remaining current while in special service, confirming its positive role.

Sensitivity Analysis of Survival Probabilities and Pricing Implications

Because real estate market variables are the most economically significant, we perform a sensitivity analysis assuming two opposing real estate market scenarios. Table 1 shows those assumptions and results. Case 1 assumes that three real estate market variables are improving by one standard deviation, while Case 2 assumes that three real estate market variables are deteriorating by one standard deviation. Both cases assume the same loan characteristics, such as LTV and DSCR. The results show significant differences in survival probabilities and loan prices. Over two years, the survival probability increases to 74.1% in an improving real estate market, while it decreases to 23.4% in a deteriorating real estate market. This significant difference in survival probability also leads to significant differences in loan prices between the two scenarios; for example, under the assumption 35% loss severity, the price difference is 17.74.

The results of the sensitivity analysis confirm the economic significance of the proportional risk factors in the empirical model. The economic implications, in fact, can be quite significant.

Table 1. Sensitivity Analysis for Different Real Estate Markets

	Base Case	Case 1: Real Estate Market Improving	Case 2: Real Estate Market Deteriorating
PeriodicLTV	63.5%	63.5%	63.5%
ValueGrowthMkt	2.0%	**6.4%**	**-2.4%**
NOIGrowthMkt	1.0%	**11.8%**	**-9.8%**
VacancyChangeMkt	0.11	**-1.51**	**1.72**
JudicialForeclosure	0	0	0
HotelFlag	0	0	0
PeriodicDSCR	1.64	1.64	1.64
LoanAge	28.5	28.5	28.5
LTVJudicial	63.5%	63.5%	63.5%
inverse Mills ratio	0.35	0.35	0.35
Survival Probability in Two Years	49.2%	74.1%	23.4%
Price Assuming:			
Loss Severity of 35%	82.23	90.93	73.19
Loss Severity of 25%	87.31	93.52	80.85
Loss Severity of 45%	77.16	88.34	65.53

Therefore, the findings of this study can and should be used by market participants to evaluate and price special-serviced loans correctly.

Conclusions

The existing literature on commercial mortgage defaults studies the process for loans in the current status to the default status, where default is defined as foreclosure (e.g., Vandell et al. 1993 and Ciochetti et al. 2002) or as 90-days-late or worse (e.g., Archer et al. 2002). This study recognizes that commercial mortgage default is not a one-step process and examines a previously unexplored aspect of it, namely, the stage between the initial delinquency to default, which we define as 90-days-late or worse. We also distinguish the servicers' behavior from the borrowers' behavior in the default process, where the servicers mainly make the initial workout strategic decisions that are expected to minimize the potential losses, while the borrowers make the repeated decisions on the default put option exercise during the course of being special-serviced. Because most problem loans become special-serviced in the CMBS market, we empirically study (a) the probability of special servicers' choosing one workout strategy versus others and (b) the conditional probability of the borrower defaulting after the loan becomes special-serviced.

We find that special servicers decide initial workout strategies based largely upon the real estate space market condition – proxied by market-level NOI growth rates. In other words, cash flow condition is the most significant factor in the servicers' decisionmaking process. We also find that borrowers are likely to make default decisions based upon both the equity position in the mortgage, as suggested by option theory, and the cash flow condition, as indicated by the space market movement; therefore the negative equity hypothesis and the ability-to-pay hypothesis appear to co-exist in the default process of commercial mortgages. In addition, key real estate space market variables, such as market-level vacancy rates, provide very useful information in explaining commercial mortgage defaults. State foreclosure laws do not have an empirically significant relationship with the borrowers' default process. Finally, sensitivity analysis shows nontrivial economic significance of the explanatory variables; in particular, real estate market variables have the most significant impact on the pricing of special-serviced loans.

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(Footnotes)

[1] See Hendershott and Van Order (1987), Deng, Quigley and Van Order (1996), and Ambrose, Capone, and Deng (2001) for a discussion of put option theory and mortgage default.