Credit Counseling and Mortgage Termination by Low-Income Households

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ABSTRACT

Published research on credit counseling and mortgage termination is surprisingly scarce, despite substantial growth in this industry. While the purpose of counseling is to assist low-income borrowers to improve their handling of debt and thereby reduce default, counseling may also improve the borrowers' understanding of their financial position and thus induce optimal mortgage termination. Using a competing-risks framework, we study the effects on default and prepayment of a counseling program implemented in several Midwest states. We find weak evidence that the default hazard was lower for graduates of the counseling program but that their default behavior was more optimal. The prepayment hazard was higher for counseled borrowers, but their prepayment behavior was not more optimal. Overall, counseling seems to affect the lenders' profits, but the net effect should be evaluated both in terms of prepayment and default.

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1.   Introduction

Many initiatives, usually termed "affordable lending," promote loans to low-income households through the use of flexible underwriting guidelines and mechanisms for risk mitigation, such as borrower counseling. The ostensible purpose of counseling is to help low-income borrowers to better estimate the amount of debt they will be able to service and, thereby, reduce default. Counseling, however, also improves low-income borrowers' understanding of their financial position and of mortgage loan markets, and, therefore, it may have an influence on optimal mortgage termination by default or by prepayment.

Counseling has been a growing industry, but little is known about its effectiveness. Previous studies have focused on homeownership, default, and delinquency, but none have explored how credit counseling may simultaneously affect both default and prepayment decisions. Understanding how counseling may affect prepayment is important, however, because the cost of a mortgage loan includes a significant premium to compensate for prepayment risk. Some evidence suggests that low-income households exhibit higher default hazards but lower prepayment hazards, perhaps because their propensity to refinance is dampened by income and collateral constraints and because, financially, these households are less endowed and less sophisticated (Archer, Ling, and McGill, 1996; Peristiani, Bennett, Monsen *et al.,*1997; Goldberg and Harding, 2003).

This paper studies the effects of counseling on both prepayment and default by adopting a competing-risks approach to mortgage termination. Using data on a counseling program

implemented in several, mainly Midwest, states during the period 1991-2000, we explore the idea that counseling affects the borrower's financial behavior and that counseled borrowers may default less often but may also prepay more often than noncounseled borrowers, with potentially opposite effects on lender profits. The results suggest that the counseling program examined here graduated borrowers who differed in both prepayment and default patterns. The findings also show that a narrow analytical focus on the effects of counseling on just default may produce misleading results about the overall effectiveness of these programs.

2.   Discussion of the Literature

At present, there is no systematic body of research that clearly demonstrates that counseling influences default on mortgage loans (McCarthy and Quercia, 2000). Studies of counseling programs in California in the mid and late 1970s show both positive and no effects on homeownership rates, while a study of counseling programs in Detroit shows that in the long run counseling has negative effects on default (Mallach, 2001). There is evidence that general credit counseling improves the subsequent use of credit, but this result cannot be readily extended to home-purchase counseling, which is more specific and deals with both the housing and the financing decisions (Mallach, 2001; Ellienhausen, Lundquist, and Staten, 2003).

Counseling programs vary by method of delivery, desired outcomes, characteristics of the counselors (such as their stake in the transaction and qualifications), and program content. In terms of content, credit counseling programs usually include topics related to credit issues, including the financing of a home. Homeownership counseling programs include the same topics but may add others, such as finding a house and maintaining the property. This diversity requires that the research method be adjusted to address the specific characteristics of each program.

The lack of published research is also due to data scarcity. In 2000, PricewaterhouseCoopers abandoned a project to study the effectiveness of counseling, after a feasibility study concluded that lenders either do not collect or collect very limited data about borrowers who have undergone counseling (Mallach, 2001). Data availability is an important issue because even when such data are available, they are often proprietary and, thus, less accessible to external researchers. In addition, since many affordable credit programs require counseling as part of the loan qualification requirements, it is hard to find an adequate control group.

This is one of the challenges that Hirad and Zorn (2002) encounter in their, to date, most comprehensive study on the effectiveness of homeownership counseling. These authors use a sample of 40,000 mortgages, originated under the Freddie Mac's Affordable Gold program, to assess how prepurchase homeownership counseling affects delinquency rates. They us as a quasi-control group borrowers in the Affordable Gold program who qualified for exemption from counseling. The attributes of these borrowers that made them qualify as an exception, the authors claim, may make them somewhat different from counseled borrowers. Hirad and Zone attempt to control for this endogeneity by using a nested logit model, and, after this correction, they find that counseling still decreases the 90-day delinquency rate and that different types of counseling vary in their effectiveness.[1] However, despite these adjustments, the study fails to confirm the effectiveness of some types of counseling, such as individual in-person counseling and home-study counseling.

The Hirad and Zorn study focuses on delinquency and uses a logit model, where the explanatory variables are controls for counseling, borrower characteristics, and loan and property features. Quercia and Watcher (1996) suggest that innovative methods to study the effectiveness

of counseling could be derived from recent developments in the literature on default. This literature views default as the exercise of an option.

According to option-based theory, the decision to terminate the mortgage (through default or prepayment) is a purely financial decision, independent of the housing decision. The value of a mortgage loan consists of the present value of the scheduled borrower payments and the value of the options granted to the borrower to terminate the mortgage either by prepayment or default. When deciding on how to act on the loan obligation, a borrower faces several choices. The borrower has the choice to (1) make the payment on the loan and continue in good standing as a debtor, (2) pay in full the remaining balance on the loan, by refinancing (prepayment or call option),[2] or (3) surrender the house to the lender in exchange for cancellation of the debt (put or default option). Thus, prepayment and default are two actions that borrowers may take to increase their wealth.[3]

Furthermore, a series of papers have developed theoretical arguments that emphasize the importance of the *jointness* of the prepayment and default options (Kau, Keenan, Muller *et al.,* 1992 and 1995). At least partially, this development was motivated by the observation that the default rates predicted by option theory differed from observed default rates. Failure to exercise the default option, researchers reasoned, might indicate that borrowers expect that this option may have an even higher value in the future. Moreover, borrowers might not exercise the default option when it is in-the-money because they may expect that in the future the prepayment option would be more valuable.

As a result of these theoretical developments, mortgage termination is now being specified in a competing-risks framework, where the values of the prepayment and default options are included and where controls for borrower heterogeneity, trigger events, and

transaction costs are included (Deng, 1997; Deng and Gabriel, 2002; Deng, Quigley, and Van Order, 2000; Clapp, Goldberg, Harding *et al.,* 2001; Pavlov, 2001; and Archer, Ling, and McGill, 2003).

A competing-risks approach is appropriate to study the effects of credit counseling because counseling may improve the borrowers' level of financial sophistication, since it introduces concepts such as the present value of money and effective annualized interest rates. As interest rates and property values change, borrowers who have undergone counseling may have a better understanding of how these changes affect the value of their loan obligations. This knowledge may improve the borrowers' ability to "price" their options and exercise optimal default or prepayment, which is costly to the lender. Lenders would need to be aware that the potential benefit of lower default rates must be weighed against the potential cost of a higher rate of optimal exercise of the prepayment option. Thus, exploring the effect of counseling on both prepayment and default will more fully account for its consequences. The public policy objective of improving the borrowers' status is, in turn, achieved through the broader financial opportunities that they can consider, including the refinancing of their home at better terms and conditions.

3. Description of the Credit Counseling Program

The *Community Mortgage Loan Program* (CML) studied here was part of a larger community centered banking program, organized by a major bank in Columbus, Ohio, to fulfill CRA requirements and to offer financial services to underserved communities. The larger program targeted low- to moderate-income households that did not routinely use the banking system and that typically were denied loans. The objectives of the community centered banking program

were to improve the integration of the financial services offered in a community and to enhance opportunities available to low- and moderate-income households. The program was organized in collaboration with community churches and a local consulting firm with experience in implementing community outreach programs.[4] Potential clients were approached through a series of seminars organized by community churches. Through this program, low-income households gained access to a full range of banking services: checking and savings accounts, student and consumer loans, and educational services.

As the bank learned more about the financial habits of the target population, it identified a substantial unmet demand for mortgage loans. The CML program was initiated in 1992 with the purpose of offering cost-effective mortgage loans to low-income households, in a fashion profitable to the bank. The program's features were designed for this specific market segment. Borrowers could get mortgage loans for up to $75,000 with a down payment of 5 percent of the loan or $1,000, whichever was lower, while gifts and grants were accepted as sources for the down payment.[5] The bank offered eased credit restrictions, a 1 percent origination fee, and no discount points; the bank would also negotiate the payment of mortgage insurance, and when applicable, it would pay for the counseling services. To cover its costs, the bank charged an interest rate 150 points above the Fannie Mae 60-day average rate on 80 percent LTV-conforming loans.

At the beginning of the program, counseling was not available in all regions or at all times in areas where the bank was organizing seminars and offering its services; therefore, some borrowers received counseling and some did not. In fact, according to bank representatives, counseling services were offered quite randomly prior to 1996 because of the lack of systematic agreements with counsel providers and because of various pressures to fulfill lending targets.

Since 1996, Fannie Mae became a partner in the program, by offering to buy nondelinquent loans seasoned for at least three years. Since 1996, counseling became a mandatory part of the qualification for mortgage loans with this program. All borrowers recruited through the seminars organized in collaboration with community churches were required to meet with a counsel provider at least once.

Consumer Credit Counseling Services (CCCS), an organization with several decades of experience, provided the counseling. It offered a product based on proximity to, and knowledge of, the potential clientele. To address the specific needs of each borrower, the amount of counseling was individually determined. Each potential borrower provided preliminary information, on the basis of which a counselor determined how many sessions each person had to attend. Counseling included some traditional topics, such as how to improve spending habits, correct problems from not-sufficient-funds checks, improve use of credit, and consolidate debt. Potential clients discussed with a counselor where they lived, whether they had changed their job, and the evolution of their income. Depending on the client, counseling could sometimes last up to two years.[6]

Some parts of this counseling program differed from the traditional counseling offered by the CCCS. On recommendations of the consulting firm that helped to bring together community churches and the bank, counselors focused on the *cash flows* of potential borrowers. Potential borrowers learned how to keep track of their living expenses, measure their level of debt, and calculate whether the expected service of the mortgage loan was sustainable. Graduation from the counseling program was granted only to those participants who, given an interest rate and a loan amount, could generate zero or positive cash flow, based on a thorough calculation and verification of their actual living expenses and debt obligations. Loan amounts adjusted by these

criteria did not always correspond to those resulting from the standard financial ratios used as a screening device.[7] Households who could not become homeowners did not graduate from the counseling program and were not able to get mortgage loans. Graduation made borrowers eligible to apply for a loan at the bank, and the bank had a final say on who was granted a loan and who was denied.

The CML program also combined counseling with some financial assistance. If the borrower could not afford the lower of 5 percent of the loan or $1,000 as a down payment, she was granted a consumer loan to allow her to comply with this requirement. The extra debt was accounted for in the calculation of the household's cash flow constraints.

The expertise of the counselors, combined with a conservative approach to maximum sustainable debt estimation, may be important advantages of counseling in reducing default. Since the program improved the low-income households' understanding of the way mortgage loans affect their welfare, counseling may have affected prepayment behavior as well.

4.   Methodology

We study the prepayment and default behavior of counseled and noncounseled borrowers in a competing-risks framework. Prepayment and default are two choices—driven by the value of the underlying prepayment (call) and default (put) options—that borrowers make in order to increase their wealth. Since, by exercising one option the borrower gives up the other, the extent to which one option is in-the-money affects the exercise of the other. For instance, the probability of prepayment is a function of the extent to which the default option is in-the-money. This jointness of the two options is captured well in the competing-risks framework.

Option-based theory stipulates that when a payment on the mortgage loan becomes due, depending on the value of the put and call options and given transaction costs and trigger events, the borrower decides whether to default on the loan, prepay, or remain current. Let default and prepayment be termination events, and let loans that remain current be observations that were censored at the time of data collection. To develop the competing-risks model, we first consider a hazard function for default and a hazard function for prepayment, defined as

$$\lambda_j[t; X(t)] = \lim_{h \to 0} h^{-1} P(t \leq T < t + h \mid J = j) \qquad \text{for } j=1,2 \qquad (1)$$

where $j=1$ for default and $j=2$ for prepayment, T is continuous termination time, $x(t)$, $t \geq 0$ is a vector of possibly time-dependent covariates, and $X(t) = \{x(u) : 0 \leq u < t\}$; that is, $X(t)$ is the history of the covariates prior to time t. Here, $\lambda_j[t; X(t)]$ represents the instantaneous rate of termination (by default or prepayment), given $X(t)$. If only one termination type can occur, namely, if the borrower could either prepay or default, then

$$\lambda[t; X(t)] = \sum_{j=1}^{2} \lambda_j[t; X(t)] \qquad (2)$$

Applying the specification of the Cox model, the termination-specific hazard function is

$$\lambda_j[t; X(t)] = \lambda_{0j}(t) \exp[Z(t)' \beta_j] \qquad \text{for } j=1,2 \qquad (3)$$

Here, $Z(t)$ is a p-derived vector of possibly time-varying covariates defined as a function of $X(t)$, where $X(t)$ is left continuous with right-hand-side limits, and the baseline hazard $\lambda_{0j}(t)$ and regression coefficients β_j can vary arbitrarily over termination types, namely, the baseline hazards of default and of prepayment and the estimated coefficients are allowed to differ as required. The survivor function for each hazard is S (which is nothing else than one minus the *cdf*), and it is defined as

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$$S[t; X(t)] = \exp- \int_0^t \lambda_{0j}(u) \exp[Z(u)'\beta_j] du \tag{4}$$

The individual *pdf* for each termination type is

$$f_j[t; X(t)] = \lambda_j[t; X(t)] S[t; X(t)] \qquad \text{for } j=1,2 \tag{5}$$

If $t_{ji} < \ldots < t_{jk_j}$ denote the k_j time of type j termination and Z_{ji} denote the regression function for

the individual that terminated the loan at t_{ji}, then the loglikelihood for each hazard is

$$LogL(\beta_j) = \sum_{i=1}^{k_j} \left[\exp[Z_{ij}(t)\beta_j] - \sum_{l \in R(t_{ji})} \exp[Z_l(t_{ji})'\beta_j] \right] \tag{6}$$

where β_j for $j=1,2$ are the estimated coefficients and $R(t_{ij})$ is the set of all individuals who have

not terminated and are still under observation just prior to t. The baseline hazard is eliminated

and therefore not estimated in this model, but it is allowed to vary in time.

This paper uses variables introduced in Deng, Quigley, and Van Order (1997 and 2000)

and also used in other studies about mortgage termination (Ambrose and Capone, 2000; Pavlov,

2001) in order to measure the influence of the put and call options on mortgage termination. The

first of these variables measures the probability that the put option is in-the-money. Namely, the

probability that defaulting has value, PROBNEQ, is defined as:

$$\text{PROBNEQ}_{i,k_i} = prob(E_{i,k_i} < 0) = \Phi\left(\frac{\log V_{i,m_{j,\tau_i+k_i}} - \log M_{i,k_i}}{\sqrt{w^2}} \right) \tag{8}$$

where E_{i,k_i} is the equity in the house for the ith individual, evaluated k periods after origination,

$\Phi(.)$ is a cumulative standard normal distribution function; $V_{i,m_{j,\tau_i+k_i}}$ is present value of the

outstanding loan balance at the $m_{\tau_i+k_i}$ market interest rate, and w^2 is the estimated variance from

repeat (paired) sales, by state, provided by the Office of Federal Housing Oversight (OFHEO).

Here, M_{i,k_i} is the market value of the property, purchased at cost C_i at time τ_i. Evaluated k_i months thereafter, it is

$$M_{i,k_i} = C_i \left(\frac{I_{j,\tau_i+k_i}}{I_{j,\tau_i}} \right) \tag{9}$$

where the term in parenthesis follows a log-normal distribution, and I_{j,τ_i} is an index of house prices by state j, at time τ_i. The higher the value of PROBNEQ, the higher the probability that the equity in the house is negative and the more profitable it would be to default.

To study whether the call option influences prepayment, this paper uses PREPAY, which is equal to one minus the ratio of the present value of the unpaid mortgage balance at the current market interest rate $m_{\tau_i+k_i}$, relative to the value discounted at the contract interest rate. That is

$$PREPAY_{i,k} = 1 - \frac{V_{i,m_{j,\tau_i+k_i}}}{V_{i,r}^*} \tag{10}$$

where

$$V_{i,m_{j,\tau_i+k_i}} = \sum_{t=1}^{TM_i-k_i} \frac{P_i}{(1+m_{\tau_i+k_i})^t}$$

$$\tag{11}$$

$$V_{i,r_i}^* = \sum_{t=1}^{TM_i-k_i} \frac{P_i}{(1+r_i)^t} \tag{12}$$

and where P_i is the monthly payment of principal and interest and r_i is the contract interest rate. Positive values of PREPAY would indicate that the option is *out-of-the-money;* that is, it is not to the borrower's advantage to prepay. The option will move *in-the-money* as PREPAY becomes negative, because negative values would indicate that the contract interest rate is higher than the market rate and that it will be profitable to refinance.

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Other time-variant events that affect termination are divorce and shocks to income (Quigley and Van Order, 1995; Elmer and Seelig, 1999). These have been characterized as trigger events, because they may trigger termination through either default or prepayment. We control for these events through a dummy variable SHOCK, by assuming that borrowers who did not report an adverse event as the reason for termination terminated their mortgage because it was "profitable" to do so.

The time-invariant covariates included are the amount of the loan, amount of monthly payment, and value of the house, which serve as proxies for the borrower's income and wealth, if mortgage insurance was paid by the bank, property type (single-family or two family), year of origination, and the loan-to-value ratio at time of origination, which serves as a proxy for the down payment.[8]

The specification uses controls for the value of the default and prepayment options in the default and prepayment regressions, respectively, as well as for loan contract terms, property type, and shock events. The impact of counseling is evaluated through a dummy for counseling and an interactive dummy, constructed by multiplying the counseling dummy by the variable that approximated the default (prepayment) option in the default (prepayment) regression. While the counseling dummy measures the difference between the two groups in terms of the rate of termination, the interactive dummy measures the difference between the two groups in terms of *optimal* termination. The latter is of special interest to lenders, because termination by itself is not necessarily costly but optimal termination is costly.

Loans in default are defined as loans for which foreclosure took place, loans tied up in bankruptcy procedures, and/or loans for which a loss was realized, as well as loans coded as DIL (deed in lieu of foreclosure), and PRS (presale/short sale). Default is recorded at a time when

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these loans became 90 days overdue. Regarding prepayment, the information available is less detailed. The bank has not collected information on the reason for prepayment—refinancing or moving. This may affect the results. Clapp, Goldberg, Harding *et al.* (2001) report that prepayment due to refinancing and prepayment motivated by moving are affected by different factors.

5. *The Data*

The complete data set consists of 1,338 loans originated from 1992 to 2000, to borrowers mainly in Ohio but also to a few borrowers from Florida, Indiana, Kentucky, Michigan, and West Virginia (Table 1). Thirty-two observations were deleted because origination data were incomplete; thus, the number of loans considered is 1,306. The sample of those loans originated prior to 1996, when counseling was offered in some regions and periods and not in others, contains 919 observations. Of them, 410 were loans to counseled borrowers and 509 to non-counseled clients (Table 1). During the period from 1996 to 2000, when counseling became mandatory for everyone recruited through the CML program, the bank originated 387 loans.

In the sample, repayment records expand up to nine years, with most loans still outstanding. The characteristics of the portfolio are shown in Table 2, which is organized into two panels. Panel A shows data for the complete portfolio, and Panel B shows data for all loans originated prior to 1996. Clearly, using only loans originated prior to 1996 is better, because the nonuniform availability of counseling makes the group of noncounseled borrowers an appropriate control group for several reasons. First, counseling was not mandatory during the period, so counseling was somewhat random. Second, these loans were granted under relatively similar economic conditions, compared to more recent loans (Graph 1 and Graph 2).

The analysis of these data is interesting because counseling is often made mandatory for low-income borrowers, as a precondition for mortgage loans, and rarely are there suitable control groups. Analysis of the sample of loans originated prior to 1996 and of the portfolio with loans originated after 1996 allows us to study not only whether counseling affects termination but also the consequences of making counseling mandatory for everyone, in a population of low-income borrowers who otherwise do not use the banking system and who might be categorized by traditional criteria as less creditworthy.

Before controlling for other features, a comparison of loan behavior for the two groups (Table 2) reveals that, for loans granted prior to 1996, prepayment patterns do not differ, while default is slightly higher for counseled borrowers. If noncounseled borrowers are compared, however, to all counseled borrowers, including those who received a loan after counseling became mandatory in 1996, then counseled borrowers show both lower default and prepayment rates.

Definitions of the variables used in the regression analysis are shown in Table 3. The database does not contain information about borrower characteristics that have been found to be related to termination. Loan amount, house value, monthly payment, and LTV at time of origination are used to proxy the level of housing that each household was able to afford, and they may, to a limited extent, proxy for household income and wealth. Loan-to-value at origination can be used to control for the amount of the down payment and for borrower heterogeneity, following Pavlov (2001), who includes LTV among variables that proxy for heterogeneity.[9]

Table 4 shows the means and standard errors of the variables for various groups—all loans, loans originated prior to 1996, counseled borrowers and noncounseled borrowers. The

data reveal that the two groups are similar. As expected, the probability of negative equity had increased at the time of default for all groups. Counseled borrowers show higher values of the probability of negative equity at both the time of origination and the time of termination. As expected, loans were repaid when the value of the prepayment option was in-the-money, as indicated by the negative sign of this variable at termination. Compared to noncounseled borrowers, counseled borrowers started with a higher value of the prepay option.

A trigger event was the reason for default for one-half of the counseled borrowers, while only 30 percent of noncounseled borrowers reported a shock event as a reason for default, but this difference is not statistically significant. Although the data show that a larger proportion of noncounseled borrowers qualified for a loan without mortgage insurance (9.7 percent versus 5.9 percent for counseled borrowers), this difference is not statistically significant. Mortgage loans were used mainly to buy single-family houses. The proportion of counseled borrowers who bought this type of house is slightly higher, which may explain why loan amount, house value, and monthly payment are higher for counseled borrowers. The data on origination indicate how the program progressed as the share of noncounseled borrowers decreased.

6.   **Discussion of the Results**

The results show that counseling must be evaluated in terms of its effects on both prepayment and default. Borrowers who graduated from the counseling program have different default and prepayment hazards, and they differ in the optimal exercise of their default and prepayment options.

Model 1 in Table 5 presents the results of a model that uses data for all loans prior to 1996. It is the best model because it does not include mandatory counseling. Although counseled borrowers did not default less than noncounseled borrowers (the coefficient on the dummy

variable is not significant), they did prepay more often than noncounseled borrowers. In addition, counseled borrowers exercised more optimally their default option compared to non-counseled borrowers, as the coefficient of the interaction term (counseled times the variable that approximates the value of the default option) is statistically significant. It seems that counseled borrowers are more likely than noncounseled borrowers to default when it is "profitable" to default because the value of the house is less than the value of the outstanding balance. This makes default by counseled borrowers costlier to the lender. The lack of significance of the interactive dummy in the prepayment model indicates that counseled borrowers do not exercise more optimally than noncounseled borrowers their prepayment option; that is, they do not react more keenly to financial incentives when considering prepayment. Thus, in terms of prepayment, loans to counseled borrowers may be more valuable to lenders.

A test of the joint significance of the counseling and the interactive dummies is reported at the bottom of Table 5 for each of the mortgage termination types. It indicates that the hypothesis that counseled borrowers do not differ from noncounseled borrowers is rejected at the 10 percent level, thus providing evidence that counseling influenced both prepayment and default.

Model 2 in Table 5 presents the results from regressions using the complete portfolio, including loans originated after 1996, when counseling became mandatory. This model includes dummies for year of origination, to control for differences in economic conditions prior to 1996. The results indicate that counseled borrowers default less often but that their default behavior is more optimal. In this model, counseled borrowers still prepay more often, but they do not exercise optimal prepayment, as the interactive dummy is positive (not negative) and significant. However, a test of joint significance of the counseling dummy and the interactive dummy

indicates that there is no statistically significant difference between the two groups in terms of both prepayment and default. The effect of counseling seems to be influenced by the fact that, since 1996, all borrowers recruited via church seminars were asked to go through mandatory counseling, and thus the effect of counseling is less pronounced than for the earlier period.

The results also indicate that the competing-risks framework is appropriate to study mortgage termination by low-income households. As expected, and in both models, default is positively and significantly influenced by the probability of negative equity and by the value of the prepayment option. Also as expected, and in both models, PREPAY significantly affects prepayment; that is, the more negative PREPAY is, the more profitable it is to prepay. [10]

As expected, the variable that approximates the effect of trigger events is significant for the default hazard in both specifications, and it is even negative and significant in the prepayment hazard of Model 2. Borrowers who bought single-family or two-family houses were less likely to default, but property type did not affect prepayment hazard.

For the low-income borrowers who participated in the CML program, larger loan size increased the chances that the mortgage would have been terminated. The value of the property did not affect prepayment, but borrowers who bought houses of higher value had lower default hazards.[11] Loans with higher monthly payment were less likely to be prepaid but more likely to go into default. It is widely accepted that loans with higher LTV (smaller down payment) are more risky. The results show that this was not the case in this portfolio. Instead, borrowers with higher LTV had lower default hazards. Although such a result is not unusual in lending to low-income households, it may also reflect here the willingness of the bank to add a consumer loan for this purpose.[12] Microlenders have discovered that, in low-income communities, the poorer the borrower (that is, the less collateral he/she has), the more important reputation becomes, and

this translates into fewer defaults among the poorest of the poor (Chaves and Gonzalez-Vega, 1996; Aghion and Morduch, 2000).[13]

6.   Conclusions

Published research on credit counseling and mortgage termination is surprisingly scarce, despite substantial growth in this industry. Counseling, however, is usually a mandatory requirement for low-income households that want to qualify for a mortgage loan, it is expensive, and it is important to understand how it affects mortgage termination. This paper uses a competing-risks framework to study the effects on both default and prepayment of a counseling program implemented in several Midwest states. The paper finds some limited evidence that the default hazard was not lower for the graduates of the counseling program, although their default was more optimal than that of noncounseled borrowers. In terms of prepayment, counseled borrowers had higher prepayment hazard than noncounseled borrowers, but their prepayment is less optimal. Thus, counseling decreased default hazard but made default more costly for the bank, and it increased prepayment but made prepayment less costly to the lender. Overall, counseling seems to affect the lender's profits, and its effect should be evaluated in terms of both prepayment and default.

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Table 1.Geographic Distribution of the Loans, by year [a]

Year	OH	FL	IN	KY	MI	WV
1992	100[b]					
1993	100					
1994	100					
1995	89.1	3.9	2.3	0.0	1.6	3.1
1996	86.5	1.9	1.9	5.8	0.0	3.8
1997	92.0	0.9	1.8	1.8	0.0	3.6
1998	89.4	2.1	0.0	4.3	1.1	3.2
1999	93.1	1.4	1.4	2.8	0.0	1.4

[a] All loans to noncounseled borrowers are to borrowers from Ohio.
[b] As a percentage of the loans originated in the current year.

Table 2. Description of the Portfolio

Panel A: All loans in the portfolio

Loan Status	Noncounseled		Counseled		Total	
	Number	%	Number	%	Number	%
In Default	42	8.3	55	5.6	97	7.4
Prepaid	81	15.9	124	12.7	205	15.7
Current	386	75.8	800	81.7	1004	76.9
Total	509	100	979	100	1306	100

Panel B: Loans originated prior to 1996

Loan Status	Noncounseled		Counseled		Total	
	Number	%	Number	%	Number	%
In Default	42	8.3	38	9.3	80	8.8
Prepaid	81	15.9	63	15.4	124	13.6
Current	386	75.8	309	75.4	705	77.6
Total	509	100	410	100	909	100

Table 3. Definitions of Variables

Variable Name	Description of the Explanatory Variables
COUNSELED	1 if the borrower was counseled, zero otherwise
PROBNEQ	Probability that the borrowers' equity is negative (as in Deng *et al.,* 2000)
PREPAY	1 minus the ratio of the discounted value of the remaining mortgage payment, at the current market interest rate, to the discounted value of the remaining mortgage payment, at the contract interest rate
LTV	Loan-to-value ratio at time of origination
SFHOUSE	Property is a single-family house
DFHOUSE	Property is a two family house
SHOCK	1 if the borrower has indicated that a shock event has caused the delinquency, 0 if no reason was indicated
LAMOUNT	Loan amount
HVALUE	House value at time of loan origination
MPAY	Monthly payment on the loan (principal and interest, does not include insurance and taxes)
NMI	1 if the loan did not need/have mortgage insurance
ORIGIN92	The mortgage was originated in 1992
ORIGIN93	The mortgage was originated in 1993
ORIGIN94	The mortgage was originated in 1994
ORIGIN95	The mortgage was originated in 1995

Table 4. Means and Standard Errors of the Regression Variables, by groups

	All loans (prior to 1996)	Non-counseled	Counseled[d] (prior to 1996)	Counseled[d] (all loans)	All loans
COUNSELED[a]	0.446				0.610
	(0.497)				(0.488)
PROBNEQ	0.386	0.261	0.588**	0.629***	0.427
	(0.347)	(0.243)	(0.398)	(0.401)	(0.370)
PROBNEQ[b]	0.520	0.361	0.696	0.738	0.575
	(0.330)	(0.279)	(0.294)	(0.261)	(0.327)
PREPAY	-0.036	0.021	-0.101*	-0.131***	-0.073
	(0.101)	(0.053)	(0.102)	(0.083)	(0.105)
PREPAY[b]	-0.161	-0.115	-0.219	-0.209	-0.172
	(0.101)	(0.068)	(0.105)	(0.093)	(0.096)
SCHOCK[c]	0.400	0.309	0.500	0.491	0.412
	(0.493)	(0.468)	(0.507)	(0.505)	(0.495)
NMI	0.077	0.097	0.059	0.165***	0.134
	(0.267)	(0.296)	(0.235)	(0.372)	(0.341)
SFHOUSE	0.929	0.917	0.978**	0.961***	0.943
	(0.257)	(0.276)	(0.220)	(0.194)	(0.233)
TFHOUSE	0.042	0.047	0.036	0.031	0.038
	(0.202)	(0.213)	(0.186)	(0.174)	(0.190)
LAMOUNT	44,237	43,295	45,692**	48,806***	46,326
	(11,242)	(10,619)	(12,192)	(14,806)	(13,477)
HVALUE	48,204	47,226	49,083*	52,693***	50,564
	(12,223)	(12,094)	(12,244)	(15,561)	(14,449)
MPAY	349.969	326	379***	394***	370
	(9.852)	(81)	(106)	(119)	(112)
Log (RINCIPAL)	10.657	10.640	10.680**	10.731***	10.696
	(0.305)	(0.280)	(0.372)	(0.347)	(0.328)
Log(HVALUE)	10.746	10.727	10.762*	10.823***	10.787
	(0.287)	(0.275)	(0.301)	(0.329)	(0.311)
Log(MPAY)	5.814	5.752	5.982***	5.932***	5.863
	(0.316)	(0.280)	(0.328)	(0.343)	(0.336)
LTV	91.843	91.883	92.488	91.636	91.728
	6.434	(5.896)	(7.898)	(8.136)	(7.696)
ORIGIN 92	0.214	0.326	0.077***	0.039***	0.151
	(0.411)	(0.469)	(0.266)	(0.194)	(0.358)
ORIGIN 93	0.366	0.529	0.179***	0.089***	0.258
	(0.482)	(0.499)	(0.379)	(0.285)	(0.438)
ORIGI N 94	0.249	0.140	0.426***	0.218***	0.183
	(0.433)	(0.347)	(0.495)	(0.413)	(0.387)
ORIGIN 95	0.168	0.020	0.324***	0.160***	0.123
	(0.374)	(0.044)	(0.468)	(0.413)	(0.329)
Sample size	909	509	410	979	1306

[a] all values are at origination unless indicated otherwise
[b] values at termination
[c] values at default
[d] stars indicate statistically significant difference in the means, counseled compared with noncounseled, * at 10 percent level, ** at 5 percent level and *** at 1 percent level.

Table 5. Maximum Likelihood Estimates of a Competing-Risks Model of Mortgage Prepayment and Default

| | Model 1: Loan Originated prior to 1996 | | Model 2: All loans | |
	Prepay	Default	Prepay	Default
COUNSELED	0.589	-1.587	0.498	-2.331
	(2.18)	(1.40)	(1.89)	(2.05)
C* PREPAY	1.704		2.553	
	(1.02)		(1.83)	
C* PROBNEQ		3.543		3.782
		(1.88)		(2.13)
PROBNEQ	-1.563	5.248	-2.267	6.768
	(1.74)	(2.81)	(3.22)	(3.89)
PREPAY	-14.831	17.984	-17.965	18.351
	(6.08)	(5.13)	(9.44)	(6.03)
NMI	-0.452	-0.455	0.058	-0.246
	(1.21)	(0.81)	(0.20)	(0.40)
SHOCK	-0.530	1.615	-0.575	1.755
	(1.52)	(6.88)	(1.88)	(8.05)
LTV	0.056	-0.572	0.356	-0.591
	(1.20)	(3.21)	(0.82)	(3.25)
SFHOUSE	-0.166	-1.792	-0.090	-1.832
	(0.19)	(3.38)	(0.09)	(3.53)
TFHOUSE	-0.255	-1.579	-0.401	-2.012
	(0.27)	(2.04)	(0.38)	(2.54)
LAMOUNT	5.217	26.406	9.136	32.64
	(2.37)	(1.95)	(4.31)	(2.32)
HVALUE	2.291	-35.993	1.530	-35.906
	(1.32)	(2.67)	(0.90)	(2.55)
MPAY	-7.166	9.727	-10.324	3.274
	(4.35)	(3.12)	(6.25)	(1.41)
ORIGIN92			-3.914	-2.741
			(9.80)	(5.38)
ORIGIN 93			-3.346	-1.994
			(9.60)	(4.20)
ORIGIN 94			-2.615	-0.721
			(8.70)	(2.00)
ORIGIN 95			-2.340	-0.399
			(6.91)	(1.07)
Log likelihood	-878	-775	-1202	913
Wald Chi2	113	176	347	238
Joint significance test (p-value)	5.56 (0.058)	5.17 (0.076)	4.15 (0.12)	4.57 (0.102)
No. observations	919	919	1306	1306

t-values are in parentheses.

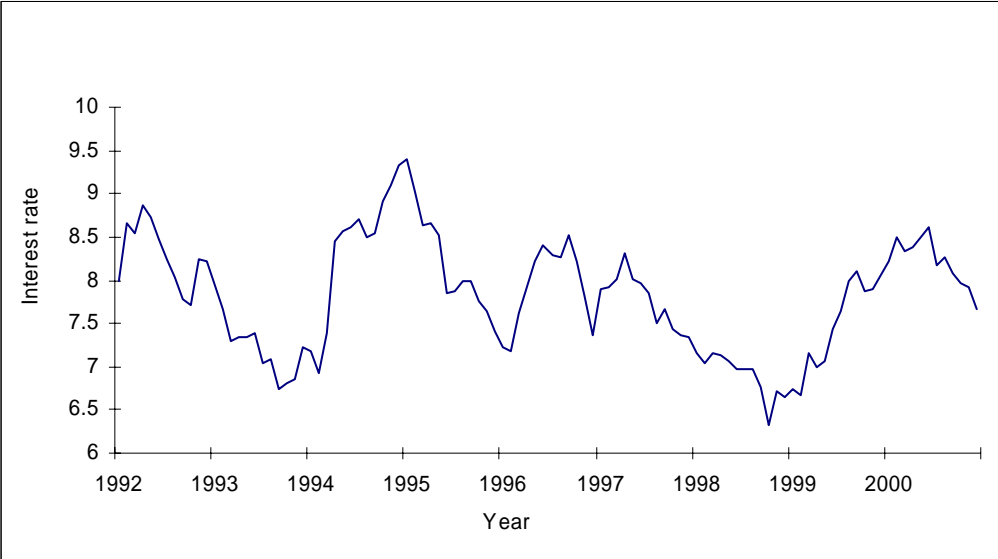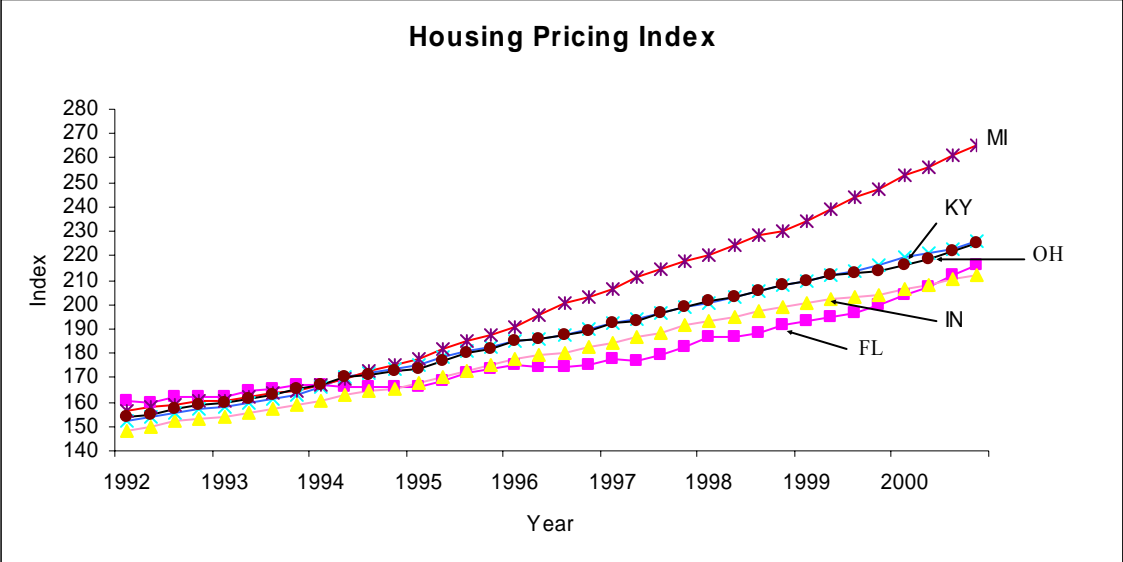Figure 1. Fannie Mae 60-Day Averages for 30-Year Fixed Rate Mortgages

Figure 2. Housing Price Index by State

Housing Pricing Index

[1] Without adjustment for endogeneity, Hirad and Zorn (2002) find that delinquency rates were the lowest in individual homeownership counseling programs, followed by classroom counseling, with telephone counseling being least effective.

[2] The borrower may also choose to make a partial repayment.

[3] Most empirical applications of option theory, however, recognize that the decision to terminate the mortgage is not purely financial and depends on other variables as well.

[4] The community churches and the outreach consulting firm collaborated not only in the CCB project, where the bank was the third partner, but also in other areas such as education, employment, alcohol and substance abuse, health care, community relations, and crime. This collaboration relied on and improved the social capital in the community and helped the bank to recruit more creditworthy borrowers (Hartarska and Gonzalez-Vega, 2004).

[5] In 12 cases, the bank granted loans bigger than $75,000 to customers recruited through the community churches.

[6] All counseling was prepurchasing counseling, the focus was on the credit side of the mortgage loan, and counseling did not include topics on responsibilities of homeowners.

[7] In the absence of credit scoring methods, estimations of standard debt ratios and borrower net worth were among the most important determinants of creditworthiness, as perceived by the bank. The bank started using credit scores only in 1998, and this is why credit scores cannot be used in this analysis.

[8] Monthly payment and loan amount are not necessarily equivalent and are both included because, although most of the loans were 30-year fixed rate loans, on occasion the bank granted fixed rate loans for 10, 15, 20, or 25 years. No information on these outliers was available, however.

[9] Since data on whether a second mortgage was used are not available, this variable may be a poor proxy for the impact of down payment.

[10] Models 1 and 2 were re-estimated by restricting the sample only to loans in Ohio, as all noncounseled loans were to borrowers in Ohio. No qualitative differences were found, and the results from the full sample are reported because the goal here is to evaluate the effectiveness of the complete program.

[11] Since these variables are correlated (with coefficients above 0.80), results should be interpreted with caution.

[12] This variable is somewhat flawed, however, because we have no data on the use of a second mortgage.

[13] Borrowers in our sample are less wealthy, with the average loan amount of $46,000, than borrowers in the comparable study of counseling's effect on delinquency by low-income borrowers conducted by Hirad and Zorn (2002), where the average loan for a comparable period (1993-1998) was $94,000.