

The Legal Environment and the Choice of Default Resolution Alternatives: An Empirical Analysis

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Abstract. In addition to standard foreclosure, three other methods of resolution for mortgage defaults are available: bankruptcy protection, surrender of deed to the lender, and pre-foreclosure sale. This paper develops a model that specifies the choice of resolution method as a function of the state-specific legal environment and local area economic conditions. A large national data set is used to estimate a multinomial logit choice model for the 1987 to 1991 period. The results indicate that the choice of default resolution alternative is sensitive to the legal environment. The results imply that selected legal reforms will tend to improve the efficiency of the default resolution process.

Introduction

When mortgage loan defaults occur, lenders bear legal, administrative and opportunity costs that accrue in direct proportion to the total time required to resolve the default (Clauret, 1987). For this reason, recent research has focused on methods to expedite the default resolution process. In general, the focus of this research is the effect of various statutes and regulations on resolution time. For example, Clauret (1989) finds that private mortgage insurers (conventional loans) have higher aggregate loss rates in states that use the judicial method of foreclosure, have right of redemption laws and prohibitions against deficiency judgment liens (these terms are explained below). Clauret (1990) also analyzes a large number of FHA defaults and finds that losses per default are higher in judicial foreclosure and right of redemption states. Bible (1988) analyzes the average time for a sample of Louisiana (a judicial state) foreclosures. He argues that judicial states, other factors being equal, are likely to be associated with a longer average time to foreclosure.

The results of these studies imply that lender costs (losses) can be reduced by specific legal reforms that will reduce the average time required to foreclose on a delinquent loan. The present research contributes to the analysis of default resolution by recognizing that borrowers face a “menu” of choices for delinquency resolution. In addition to the standard foreclosure procedure other alternatives, such as voluntary surrender of deed to the lender (friendly foreclosure), sale of the property prior to foreclosure, and filing bankruptcy are available. Our approach presumes that these choices will be influenced by the legal environment and that the mix of statutes available in a given state will effect the

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resolution choice. We employ a large national data set to generate multinomial logit estimates of the effects of the legal environment on the default resolution choice. The results indicate that the non-foreclosure resolution choices, which are generally more efficient, will tend to be promoted by elimination of redemption and deficiency prohibition statutes. Because these outcomes usually involve cooperation among lenders and borrowers, the results imply that specific steps to encourage such outcomes will tend to reduce default losses. In addition, the results allow inference on the legal environment that is most conducive to reduced default resolution time. The paper is organized as follows: section one details the empirical model; section two presents a description of the data used in the analysis; section three summarizes the results.

The Model

The foreclosure and liquidation of residential properties is initiated by the decision of borrowers to default. A large literature has analyzed the determinants of both the probability and timing of defaults.¹ However, as noted, given that default occurs, the borrower and lender face additional choices regarding the resolution of the defaulted loan. In addition to standard judicial or power of sale foreclosures (*FORECLOSE*), defaults may also be resolved by: filing of bankruptcy protection (*BANKRUPT*), surrender of deed to the lender (*DEED*), and sale of the property prior to foreclosure (*PRESALE*). Two of the choices are unilateral by the borrower: *BANKRUPT* and *FORECLOSE*. While foreclosure is technically initiated by the lender, the borrower's choice not to seek other methods of resolution initiates the process. The remaining two choices are bilateral in that they indicate cooperation among the parties to resolve the delinquency. Note, however, that the borrower makes the choice to pursue these options by initiating contact with the lender.

The *BANKRUPT* choice is a delaying action: it does not resolve the default. It is treated as a resolution alternative in our model due to the extended delays associated with the bankruptcy process. Because of these delays, the *BANKRUPT* choice imposes additional costs on the lender. These costs include losses on the nonperforming loan as well as administrative and legal expenses. Since these costs are borne exclusively by the lender, they are not relevant for the borrower. However the *BANKRUPT* choice is not costless for the borrower: costs include legal fees, reduced access to credit and intangible costs such as damage to personal reputation. The *BANKRUPT* choice is selected when the benefits to the borrower (relative to all other choices) exceed the costs associated with bankruptcy.²

With the *DEED* choice, title to the property is voluntarily surrendered to the lender (also known as "friendly" foreclosure). In the usual case, the borrower will be subject to deficiency claims because the loan balance plus costs borne by the lender is likely to exceed the sale proceeds. However the lender often writes off the deficiency in exchange for a relatively small fee. The advantage for the lender is reduced losses due to a reduced resolution time. The benefit for the borrower is a reduction in the costs of default: the credit history will not show a foreclosure.

PRESALE indicates a resolution of the delinquency by sale of the property prior to foreclosure. The *PRESALE* choice involves cooperation between the borrower and lender to expedite sale of the property. In many cases, borrowers in default having a positive equity position will unilaterally initiate sale on their own prior to contact with the lender. This situation is precluded in our analysis since the *PRESALE* cases included

in our data are limited to situations where the borrower has zero or negative equity: the lender's losses are minimized but not eliminated.

The choice of resolution method is modeled in a utility maximizing framework: we assume that the chosen resolution alternative is that one that maximizes borrower utility. The probability of resolution of the delinquent mortgage for each choice is given by:

$$\text{PROB}(\text{CHOICE}_{i,t} = j) = \exp(\beta_j X_{i,t}) / \sum \beta_j X_{i,t}, \quad (1)$$

where $\text{PROB}(\text{CHOICE}_{i,t} = j)$ is the probability that individual i will select choice j ($j = 1-4$; 1 = *FORECLOSE*, 2 = *BANKRUPT*, 3 = *PRESALE*, and 4 = *DEED*) and β_j is the estimated effect of X on this probability. X is given by:

$$X = F(\text{CURRENTLTV}, \text{JUDICIAL}, \text{APPREC}, \text{REDEMPTIME}, \\ \text{DEFICIENCY}, \text{BALANCE}, \text{PERCAPINC}, \text{FLORIDA}, \\ \text{TEXAS}, \text{TIME}), \quad (2)$$

where:

- CURRENTLTV* = the estimated current loan balance to house value ratio;
- JUDICIAL* = a binary variable that equals 1 if the default occurred in a judicial foreclosure state and 0 if it occurred in a power of sale state;
- APPREC* = the annualized average rate of appreciation from default until the date of the title transfer;
- REDEMPTIME* = the statutory redemption period in months (*REDEMPTIME* equals 0 if the state does not have a redemption statutes);
- DEFICIENCY* = a binary variable that equals 1 if the default occurred in a state allowing deficiency judgments and 0 otherwise;
- BALANCE* = the unpaid mortgage loan balance (\$000s);
- PERCAPINC* = per capita income in the quarter of the default;
- FLORIDA* = a binary variable indicating defaults that occurred in Florida and 0 otherwise;
- TEXAS* = a binary variable indicating defaults that occurred in Texas and 0 otherwise;
- TIME* = the number of days in delinquency, where delinquency is defined as the time from default until resolution.

The model is overidentified and estimation requires that restrictions be imposed on the parameters β_j , which measure the effect on the elements of $X_{i,t}$ on the j th choice. The estimation procedure restricts β_j equals 4 to equal 1, and the other β parameters provide relative measures. Because of this restriction, the parameter estimates are not easily interpreted.² However, derivatives of the probability of each choice with respect to the elements of X are readily calculated as follows:

$$\delta(\text{PROB CHOICE}_{it} = j) / \delta X_i = (\text{PROB CHOICE}_{it} = j) * (\beta_j - Z), \quad (3)$$

where:

$$Z = (\text{PROB CHOICE}_{it} = 1) * \beta + (\text{PROB CHOICE}_{it} = 2) \beta + \\ (\text{PROB CHOICE}_{it} = 3) * \beta.$$

The predicted relationships of the explanatory variables are as follows: *CURRENTLTV* raises the likelihood of cooperative resolution (*DEED* or *PRESALE*). As *CURRENTLTV* is higher, the ratio of the loan balance to market value is larger. There is a greater incentive for both parties to cooperate to reduce losses. Because of the incentives to cooperate, there is a reduced likelihood of resolution by *BANKRUPT* or *FORECLOSE*. *JUDICIAL* indicates states that use the judicial method of foreclosure. In the judicial foreclosure method, the lender must initiate a costly court action to acquire title to the property. The alternative is the power of sale method which expedites the process because a trustee may initiate foreclosure without a court order. Because *JUDICIAL* states are associated with a longer resolution time there is an increased likelihood of resolution by standard foreclosure (*FORECLOSE*). *JUDICIAL* is predicted to negatively effect the probability of the *BANKRUPT* choice because of the increased incentive to file bankruptcy in power of sale states. Due to the shorter duration of the foreclosure process in such states, gains from costless shelter are increased with the *BANKRUPT* choice. *JUDICIAL* is also predicted to lower the probability of the cooperative choices. Because power of sale states hasten the foreclosure process and impose higher costs on defaulters, there is a higher probability of resolution by *PRESALE* and *DEED*.

Higher *APPREC* values indicate a stronger regional housing market. Such markets are generally associated with a reduction in market time and a higher contract to ask price ratio. The relative ease of liquidation raises the costs of the unilateral choices (*BANKRUPT* and *FORECLOSE*) and lowers the probability that they will be chosen. Both parties are predicted to benefit from a cooperative resolution. With resolution by *PRESALE*, lender losses are reduced due to the expected higher percentage of principal recovered. Because deficiencies are lower, lenders are more inclined toward discharge which clearly benefits borrowers.

REDEMPTION indicates delinquencies that occur in states having redemption statutes. These laws provide the option to recover a foreclosed property for some period after the fact by payment of principal balance and all costs. From the lenders' perspective redemption rights are equivalent to a conditional lien which raises liquidation costs because marketing is more difficult.³ Thus longer *REDEMPTION* periods impose additional costs on lenders which increases the incentive for a cooperative resolution. With resolution by *PRESALE* or *DEED*, redemption rights are suspended.

DEFICIENCY identifies defaults that occur in states having laws that permit judgment liens to satisfy foreclosure sale deficiencies. Because lenders have the right to recover all administrative, legal, marketing, and other costs, there is an incentive for the borrower to cooperate with the lender. Thus there is a greater likelihood of resolution by *PRESALE* or *DEED*. However states having deficiency provisions are predicted to increase the probability that the borrower will seek bankruptcy protection. This is because bankruptcy settlements usually result in the discharge of deficiencies. In effect, the discharge feature of the bankruptcy code has the effect of nullifying deficiency recovery provisions.

The variable *BALANCE* indicates the amount of the unpaid principal balance. A larger *BALANCE* increases the incentive for lenders to seek a cooperative resolution because of the increased losses on the nonperforming loan. *PERCAPINC* proxies for the overall economic strength of the region and the unknown income of the borrower at the time of default. Higher *PERCAPINC* values correlate with increased housing demand

Exhibit 1
Predicted Effects

	<i>BANK</i>	<i>PRESALE</i>	<i>DEED</i>	<i>FORECLOSE</i>
<i>CURRENTLTV</i>	-	+	+	-
<i>JUDICIAL</i>	-	-	-	+
<i>APPREC</i>	-	+	+	-
<i>REDEMPTION</i>	-	+	+	?
<i>DEFICIENCY</i>	+	+	+	-
<i>BALANCE</i>	+	+	+	-
<i>PERCAPINC</i>	-	+	+	-

and the likelihood of the *PRESALE* choice is higher. In addition, insofar as *PERCAPINC* proxies for individual earnings, the probability of *BANKRUPT* is predicted to be lower. The rationale is that a stronger economy and increased individual earning potential raises the costs of bankruptcy, which may include reduced employment opportunities. *FLORIDA* and *TEXAS* are included in the model to control for housing market conditions that were specific to these states. The economic conditions and the magnitude of defaults in these states increases the likelihood of resolution by *BANKRUPT* and *FORECLOSE* relative to the entire sample.

TIME is included in the model to control for the effect of the length of time since default: a longer *TIME* increases the likelihood of resolution by standard foreclosure (*FORECLOSE*). Exhibit 1 lists the predicted relationship for each of the variables included in the model.

The Data and Descriptive Statistics

The primary sources of data are the servicing and foreclosure tracking systems of a large national lender. During the period analyzed, this institution serviced more than 100,000 residential and commercial mortgage loans distributed over the entire U.S. The data analyzed are the subset of defaulted (residential only) loans recorded by the tracking system. Included are a total of 2,612 defaults that occurred between August 1987 and December 1991. For all observations, the data contain detailed information on the location of the property, the original purchase price, the contract mortgage interest rate, the principal balance at default, the month of default, and the date of default resolution.

The default month is defined as the first month that the full principal and interest payment is not received. *TIME* is the number of days from the beginning of the default month until resolution by *FORECLOSE*, *DEED* or *PRESALE*.⁴

Exhibit 2 presents descriptive information on the data and the geographic distribution of sample observations. Possibly reflecting the effect of adverse regional economic conditions for the period analyzed, Florida, Texas and Colorado have the largest number of defaults. The states are listed in descending order of average *TIME* values. Note that *JUDICIAL* states tend to have longer average *TIME* values.

Supplemental data were used to construct other variables used in the empirical analysis. *APPREC*, the estimate of housing appreciation during the default period, is computed using the Fannie Mae–Freddie Mac repeat sales index which is computed for

Exhibit 2
Summary Statistics by State

State	No. of Observs	<i>TIME</i>	<i>PRESALE</i>	<i>DEFICIENCY</i>	<i>REDEMPTION</i>	Foreclose Method
New Jersey	25	506	3	no	no	Judicial
Pennsylvania	17	497	7	yes	no	Judicial
New Mexico	29	422	18	yes	yes	Judicial
Minnesota	11	415	2	yes	yes	Power of sale
Washington	44	405	18	yes	yes	Judicial
Florida	844	400	313	yes	no	Judicial
Virginia	29	391	11	yes	no	Power of sale
California	48	376	16	no	no	Power of sale
Nevada	38	373	24	yes	no	Power of sale
Oregon	19	370	9	yes	no	Power of sale
Utah	40	363	19	yes	yes	Judicial
Georgia	135	359	50	yes	no	Power of sale
N. Carolina	10	347	4	no	no	Power of sale
S. Carolina	40	339	12	yes	no	Judicial
Tennessee	31	338	11	no	no	Power of sale
Arizona	115	334	56	yes	no	Judicial
Alaska	20	325	13	no	no	Power of sale
Oklahoma	165	317	69	yes	no	Judicial
Idaho	14	302	10	yes	no	Power of sale
Colorado	295	275	104	yes	yes	Power of sale
Texas	601	264	253	yes	no	Power of sale

each state (Li, 1995). *APPREC* is the percentage change in the index for the relevant state from default until transfer of the title.

Exhibit 3 presents descriptive statistics for the variables included in the model and other variables of interest. The 2,612 observations were nearly equally divided among *JUDICIAL* (52%) and power of sale states (48%) states. Only 13% of the sample observations were not resolved by *FORECLOSE: DEED* (3%) and *PRESALE* (10%). A small percentage of the states in the sample (16%) have *REDEMPTION* statutes. Almost all of the states (94%) have *DEFICIENCY* provisions.

Exhibit 3 indicates that the average length of time from origination until default was four years and four months: the average *TIME* value was 342. The average original property value at origination was \$91,781 and the average original mortgage loan amount was \$78,767, so that the average sample loan-to-value ratio was .88.

Exhibit 4 presents the means for the same variables by the type of resolution. Exhibit 4 indicates that 218 (8%) of defaults involve the *BANKRUPT* choice, 82 (3%) are resolved by the *DEED* choice, and 271 (10%) are resolved via *PRESALE*. For defaults accompanied by *BANKRUPT* filings, the average *TIME* value increased to 524 days, a 58% increase over the average *TIME* for all defaults (342 days). *DEED* and *PRESALE* resolutions are associated with lower *TIME* values on average at 235 and 234 days, respectively. The mean *TIME* value for judicial states is 386 days and 295 days for power of sale states.

Exhibit 3
Descriptive Statistics

	Mean	Std Dev.
<i>JUDICIAL</i> State	.52	
Power of Sale State	.48	
<i>BANKRUPT</i>	.08	
<i>DEED</i>	.03	
<i>PRESALE</i>	.10	
<i>FLORIDA</i>	.32	
<i>TEXAS</i>	.23	
<i>REDEMPTION</i>	.16	
<i>DEFICIENCY</i>	.94	
Origination to Default (months)	56	18
<i>TIME</i>	342	145
Loan Amount	78,762	50,751
Purchase Price	91,781	66,973
Original Loan Amount to House Value Ratio	87.9	11.9
<i>BALANCE</i>	80,530	51,549
Contract Interest Rate	10.7	1.5
Monthly Payment	765	492

Exhibit 4
Means by Resolution Method

	All	<i>JUDICIAL</i>	Power of Sale	<i>BANKRUPT</i>	<i>DEED</i>	<i>PRESALE</i>
N	2612	1348	1264	218	82	271
<i>JUDICIAL</i>	.52			.39	.68	.48
Power of Sale	.48			.61	.32	.52
<i>BANKRUPT</i>	.08	.06	.10			.03
<i>DEED</i>	.03	.04	.02			
<i>PRESALE</i>	.10	.10	.11	.03		
<i>FLORIDA</i>	.32	.63		.19	.50	.28
<i>TEXAS</i>	.23		.48	.25	.02	.15
<i>REDEMPTION</i>	.16	.23	.09	N/A	N/A	N/A
<i>DEFICIENCY</i>	.94	.97	.91	N/A	N/A	N/A
Orig. to Default (Months)	56	56	55	50	58	61
<i>TIME</i>	342	386	295	524	235	234
Loan Amount	78,762	68,274	89,946	95,957	77,635	90,056
Purchase Price	91,781	79,373	105,013	114,857	89,630	101,802
Original Loan to Value Ratio	85.8	86.0	85.7	83.5	86.6	88.5
<i>BALANCE</i>	80,530	69,881	91,889	97,267	79,870	92,793
Contract Interest Rate	10.7	10.7	10.7	10.6	10.6	10.7
Monthly Payment	765	656	880	920	752	883

Results

Exhibit 5 presents the results of the logit derivative estimates. The derivative estimates and *t*-statistics are reported for each value of *CHOICE*. As detailed in Exhibit 5, the derivative estimates generally have the predicted signs and almost all are highly significant.

The results indicate that *CURRENTLTV* has a large impact on *CHOICE*. As *CURRENTLTV* increases there is, other factors being constant, a greater likelihood of the *PRESALE* outcome and lower probabilities of *FORECLOSE* and *BANKRUPT*. This result corresponds to expectations: as anticipated losses for the lender increase (costs to the borrower), there is a greater incentive to resolve the default in a cooperative fashion. *JUDICIAL* states are associated with a reduced likelihood of *BANKRUPT* and *PRESALE* choices and are more likely to be resolved via the *FORECLOSE* option. This is probably due to the increased time associated with judicial foreclosures which reduces the incentive for borrowers to file bankruptcy. Alternatively, in power of sale states, which are associated with a shorter foreclosure time period, there is an increased likelihood that the borrower will file bankruptcy. *JUDICIAL* states reduce the likelihood of a

Exhibit 5
Multinomial Logit Derivative Estimates

	<i>BANK</i>	<i>PRESALE</i>	<i>DEED</i>	<i>FORECLOSE</i>
Constant	.043** (6.12)	-.660** (-6.33)	-.080** (-3.87)	.697** (10.09)
<i>CURRENTLTV</i>	-.075** (-6.22)	.178** (6.34)	.016 (1.73)	-.118** (-8.47)
<i>JUDICIAL</i>	-.049** (-6.23)	-.028** (-6.24)	.001 (.266)	.076** (9.68)
<i>APPREC</i>	-.001** (-6.04)	.004** (6.31)	-.001* (-1.85)	-.004** (-8.65)
<i>REDEMPTION</i>	-.034** (-6.22)	.011** (6.47)	.003 (1.27)	.020** (9.21)
<i>DEFICIENCY</i>	.060** (6.23)	.098** (6.30)	.016** (3.04)	.174** (-10.37)
<i>BALANCE</i>	.000** (6.25)	.003** (6.32)	.000** (3.09)	-.001** (-10.30)
<i>PERCAPINC</i>	-.000** (-6.22)	.000** (6.34)	-.000 (-1.07)	-.000** (-4.30)
<i>FLORIDA</i>	-.036** (-6.21)	-.002** (-3.72)	-.008 (-1.60)	.030** (6.36)
<i>TEXAS</i>	-.035** (-6.24)	-.082** (-6.31)	-.052** (-5.66)	.169** (10.33)
<i>TIME</i>	-.001** (-6.22)	.002** (6.36)	.000* (2.15)	.001** (-7.67)

Chi-square = 263 (d.f. = 30).

*significant at 5%; **significant at 1%

(. . .) *t*-statistic

cooperative resolution: there is a reduced probability of *PRESALE*, perhaps because borrowers are less inclined to negotiate, and there is no effect on the likelihood of *DEED* surrender.

The results indicate that *APPREC* has the expected effects on choice: the probability of *BANKRUPT* and *FORECLOSE* is reduced and *PRESALE* is increased. Note however, that the magnitude of the effects is very small. *REDEMPTION* time has a negative effect on the *BANKRUPT* choice: a longer redemption time period increases the value of the option to redeem and reduces the gains associated with filing bankruptcy (which voids the redemption option). The probability of resolution by *PRESALE* is, however, increased: lenders have a greater incentive to negotiate and assist in a *PRESALE* in order to avoid the problems that redemption rights create with respect to foreclosure sales. As expected, longer *REDEMPTION* periods increase the likelihood of the normal *FORECLOSE* procedure because borrowers still retain the option to reclaim the property after the foreclosure sale. This implies that borrowers value the option even though it is seldom exercised.

The results indicate that *DEFICIENCY* states increase the likelihood of all resolution choices. The effect of *DEFICIENCY* on *BANKRUPT*, *PRESALE* and *DEED* is as predicted: there are gains for one or both parties with each of these resolution choices. The value of the *BANKRUPT* choice is increased in *DEFICIENCY* states because deficiencies are usually discharged and borrower liability is reduced. Alternatively, there is a greater likelihood of the cooperative choices because, given that bankruptcy is not filed, borrower liability is reduced by agreement with the lender.

PERCAPINC has the predicted effect and is statistically significant but the effects are very small. *PERCAPINC* lowers the probability of the *BANKRUPT* and *FORECLOSE* choices. Recall that these are the only outcomes having adverse effects on an individual's credit history. In a strong regional economy the costs of *BANKRUPT* and *FORECLOSE* may be higher due to the possible adverse impact on employment and investment opportunities.

Conclusion

Previous research has implied that the efficiency of the foreclosure process may be improved with specific legal reforms: First, the implementation of power of sale provisions in all states will reduce resolution time in judicial foreclosure states. Secondly, all states should allow deficiency judgments to be pursued for losses in excess of foreclosure sale recoveries. Third, statutory redemption laws should be repealed. The logit results reported here clarify that such reforms will tend to produce efficiency gains. In addition, the results clarify that the gains derive from the effect of the legal environment on default resolution choices by altering the relative costs and benefits. For example, the results imply that efficiency gains are likely when redemption statutes are eliminated because fewer delinquencies will involve the *BANKRUPT* and *FORECLOSE* outcomes: the benefits of these choices are reduced. Likewise, *DEFICIENCY* provisions, according to our results, will increase the benefits (to borrowers) of the *DEED* or *PRESALE* choice and raise the likelihood that they will be chosen. However, our findings also imply that the efficiency gains from certain of the policy actions may be less than anticipated due to the changes in the behavior of borrowers. For example, the results suggest that borrowers may respond to the implementation of power of sale foreclosure

procedures (intended to reduce *TIME*) by filing bankruptcy. Power of sale provisions increase the benefits of filing bankruptcy and increase the likelihood that it will occur. Thus in some cases policies intended to reduce delinquency time may not produce the expected efficiency gains.

Notes

¹See, for example, Epperson et al. (1985), Springer and Waller (1993).

²There are two benefits to the borrower for the *BANKRUPT* choice. First, the borrower may benefit from costless shelter service until eviction. Secondly, deficiencies (borrower liability for the deficiency of sale proceeds relative to outstanding liabilities) are frequently discharged by the court.

³For details of this procedure, see Green (1993).

⁴Clauret (1989) finds that lender losses are higher in states having right of redemption laws which suggests a longer time in delinquency.

⁵“Workouts,” defined as defaulted loans that were subsequently brought up to date or restructured by the lender, were censored from the database.

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