Borrower Attributes and the Risk of Default of Conventional Mortgages

SAM R. HAKIM AND MAHMOUD HADDAD*

Using a nationwide sample of 9,000 conventional mortgages, this paper examines their default based on a set of key borrower and loan characteristics. The results of a maximum likelihood failure time model show that the default risk is higher for small mortgages with a high loan-to-value ratio and for borrowers with low income and many dependents. The results also suggest that default is negatively correlated with the age of the property and the borrower's disposable income net of monthly financial obligations. (JEL O53)

Introduction

A special feature of conventional mortgage contracts is their embedded options. Each mortgage contract includes a prepayment call option, which gives the borrower the right to prepay, and a put option that enables him to sell back his property at the face value of the mortgage. Borrowers generally default when they cannot keep their monthly mortgage payments. One probable cause is a change in the borrower's transitory income following a job layoff or a sudden illness. Default of this type is characterized as involuntary because the borrower suddenly finds himself financially constrained.

In general, a homeowner would avoid exercising the default option by borrowing against the equity already accumulated. This presumes that property prices have risen since the time of purchase. In a declining price environment however, equity is diluted and a homeowner may find it advantageous to pull out of his mortgage contract by defaulting on the current loan. When his equity becomes negative, a borrower could limit his loss by selling the property to the lender at a price equivalent to the outstanding mortgage balance. Therefore, a borrower's decision to default can be viewed as the outcome of an intertemporal portfolio maximization process in which he readjusts his portfolio weights to reflect the decline in property prices.

Default of this nature is considered voluntary to the extent that the borrower, seeking freedom from financial constraints, elects to default. In this case, negative equity induces the homeowner to exercise his put option since positive equity creates an incentive to exercise the mortgage call option and to prepay, cashing in on the accumulated equity. Potential causes for voluntary default include regional recessions, a decline in property values, excess supply of housing, and so on.

*University of Nebraska and University of Tennessee—U.S.A. The authors gratefully acknowledge financial support from the Office of Thrift Supervision, Washington, DC.
One advantage of voluntary default is that the borrower can repurchase another comparable property at a lower price. Though his credit will be damaged for a minimum period of seven years following foreclosure, a borrower could still requalify for a new mortgage. By giving up his old property for another at a lower price, the borrower is able to reduce his monthly payments without altering the quality of his housing. However, the lender may seek recourse by suing for a deficiency judgment. In effect, the judgment makes the borrower liable to pay the difference between the market value of the property and the outstanding mortgage balance. In other words, the judgment is proportionate to the extent to which the put option is in the money.

Recent advances in default estimation include Clauretie [1988] who argues that regional economic diversification is significant in explaining foreclosure rates on residential loans. In a more recent study, Clauretie [1990] finds that the loan loss rate accounts for one-fifth of the impact of the loan-to-value ratio (LTV) on the total loss rate, leaving a substantial portion of default unaccounted for.

Canner et al. [1991] evaluated the mortgage loan allocation based on the borrower-perceived default risk. They found that the probability of loan delinquency is positively correlated with household unemployment, receipt of government assistance, divorce, family size, and minority status and is inversely related to the age and liquid asset holdings of a household.

The deficiency judgment resulting from the exercise of the default option is examined in Jones [1993]. He finds that during a period of sizable house price declines, the absence of the deficiency judgment magnifies the incidence of default by two to three times.

By and large, prior studies of mortgage default have attempted to show that the burden of monthly obligations relative to a borrower's income was a significant factor in increasing the likelihood of default. However, when a borrower's equity in the property is sufficiently high, the availability of equity lines of credit relieves him from involuntary default prompted by temporary income constraints. Therefore, it is believed that an important part of loan default is voluntary and driven by equity considerations from borrowers trying to optimize their intertemporal portfolio consumption. Naturally, long-term financial constraints (prolonged unemployment, permanent physical disability, and so on) are valid justifications for involuntary default behavior.

Compared to the previous research, this study offers three important improvements:

1) It adopts a failure-time hazard methodology, which allows various shapes of the baseline default rate.
2) It uses disaggregated and regionally diversified data which includes a large set of borrower characteristics.
3) It allows for both the age of the mortgage and borrower attributes to simultaneously impact the mortgage termination.

The underlying assumption is that, regardless of the borrower's characteristics, any mortgage will always be subjected to a baseline risk of default. Consequently, the findings are expected to be more robust than those showed by previous studies.

The results of this study show that a high default rate is positively correlated with a high loan-to-value ratio and low-income borrowers with a large number of dependents.