

# Leverage Cycle over the Life Cycle: A Quantitative Model of Endogenous Leverage

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## Abstract

This paper provides a quantitative model that rationalizes two well-established facts on the US housing market: leverage moves in tandem with housing prices, whereas mortgage spreads move in the opposite direction. In this model, a large number of overlapping generations accumulate housing assets using leverage. They select mortgage contracts from a menu that specifies interest rates for various levels of loan-to-value ratio (LTV), often called a Credit Surface. Within this framework, large negative endowment shocks not only reduce housing prices due to households' decreased purchasing power but also reinforce the decline by weakening the ability of houses to serve as collateral for borrowing. The Credit Surface rises and gets steeper as interest rates and spreads increase in downturns. In an application calibrated to the Great Recession, my model matches the 10-percentage-point drop in the leverage of first-time homebuyers that was observed at that time.

**JEL Classification:** E20, E44, G51, C68, D52, D53

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