

Temporal correlation of defaults in subprime securitization

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Abstract: The securitization of subprime mortgages in instruments like mortgage-backed securities and collateralized debt obligations is one of the key ingredients to the current financial crisis. During 2007 and 2008, subprime defaults increased sharply, displaying high serial correlation in their arrival. Subprime default events depend on house price changes. We establish a link between the dynamics of house price changes and the dynamics of default rates in the Gaussian copula framework by specifying a time series model for a common risk factor. We show analytically and in simulations that serial correlation propagates from the common risk factor to default rates. We simulate prices of mortgage-backed securities, which are securitized from pools of mortgages using a waterfall structure. We find that subsequent vintages of these securities inherit temporal correlation from the common risk factor. The findings in this paper normalize one important dynamic of the subprime crisis: transmission of the decline in housing prices after 2006 into financial derivatives based on subprime mortgages.