Since the financial crisis of 2008 short-term interest rates in developed economies, including the US, Eurozone, and Japan, have been at or near zero. Conventional interest rate models essentially break down in this zero lower bound (ZLB) regime. We propose to apply diffusions with sticky boundaries, as originally developed by Feller, Wentzell, Sato and Ueno, and Ikeda and Watanabe, to this problem of modeling interest rates with the ZLB. (Received August 06, 2015)