

# The non-negative constraint on the nominal interest rate and the effects of monetary policy

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## Abstract

This paper analyzes the effects of monetary policy shock when there is a non-negative constraint on the nominal interest rate. I employ two algorithms: the piecewise linear solution and Holden and Paetz's (2012) algorithm (the HP algorithm). I apply these methods to a dynamic stochastic general equilibrium (DSGE) model which has sticky prices, sticky wages, and adjustment costs of investment. The main findings are as follows. First, the impulse responses obtained with the HP algorithm do not differ much from those obtained with the piecewise linear solution. Second, the non-negative constraint influences the effects of monetary policy shocks under the Taylor rule under some parameters. In contrast, the constraint has little effects on the response to money growth shocks. Third, wage stickiness contributes to the effects of the non-negative constraint through the marginal cost of the product.

The result of money growth shock suggests that it is important to analyze the effects of the zero lower bound (ZLB) in a model which generates a significant liquidity effect.

**Keywords:** Zero lower bound; Monetary policy shock; Wage stickiness; Liquidity effect

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