

[Stochastic Models](#) >Volume 36, 2020 - [Issue 1](#)517 | 15 | 0
Views | CrossRef citations to date | Altmetric

Original Articles

Sticky reflecting Ornstein-Uhlenbeck diffusions and the Vasicek interest rate model with the sticky zero lower bound

Yutian Nie & Vadim Linetsky 

Pages 1-19 | Received 05 Nov 2018, Accepted 03 Jun 2019, Published online: 20 Jun 2019

 Cite this article  <https://doi.org/10.1080/15326349.2019.1630287> Check for updates

Sample our
Mathematics & Statistics
Journals
>> [Sign in here](#) to start your access
to the latest two volumes for 14 days

[Full Article](#) [Figures & data](#) [References](#) [Citations](#) [Metrics](#)[Reprints & Permissions](#)[Read this article](#)[Share](#)

Abstract

This article studies Ornstein-Uhlenbeck (OU) diffusions with sticky reflection at zero. Sticky reflecting OU diffusions are defined as weak solutions of a system of SDEs involving the local time at the boundary at zero. The transition semigroup and the distribution of the first hitting time up are characterized analytically via their spectral representations. The results are applied to the Vasicek interest rate model with the sticky zero lower bound, where the interest rate follows a sticky reflecting behavior at zero, with the stickiness parameter explicitly controlling how fast the interest rate leaves the zero lower bound.

Keywords:

[Sticky reflecting diffusion](#)[Ornstein-Uhlenbeck process](#)[interest rate models](#)[zero lower bound](#)

Additional information

Funding

This research was supported by the National Science Foundation under grant DMI-0200429.

Related research

People also read

Recommended articles

Cited by
15

[Standard and fractional reflected Ornstein-Uhlenbeck processes as the limits of square roots of Cox-Ingersoll-Ross processes >](#)

Yuliya Mishura et al.

Stochastics

Published online: 17 Mar 2022



Information for

[Authors](#)

[R&D professionals](#)

[Editors](#)

[Librarians](#)

[Societies](#)

Opportunities

[Reprints and e-prints](#)

[Advertising solutions](#)

[Accelerated publication](#)

[Corporate access solutions](#)

Open access

[Overview](#)

[Open journals](#)

[Open Select](#)

[Dove Medical Press](#)

[F1000Research](#)

Help and information

[Help and contact](#)

[Newsroom](#)

[All journals](#)

[Books](#)

Keep up to date

Register to receive personalised research and resources by email



Sign me up



Copyright © 2026 Informa UK Limited [Privacy policy](#)

[Cookies](#) [Terms & conditions](#) [Accessibility](#)

Registered in England & Wales No. 01072954
5 Howick Place | London | SW1P 1WG

 Taylor and Francis
Group