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Honolulu, HI. *Mathematical Tools for Modeling Negative Interest Rates*. Preliminary report.

Standard mathematical models in finance give only positive interest rates. At the same time, negative nominal interest rates have occurred several times in financial practice, as it happened in the 2008/2009 global financial crisis, in Switzerland in the 1970s or in Japan in 2003. As it is demonstrated in (Burgin, M. and Meissner, G. Negative Probabilities in Modeling Random Financial Processes, *Integration*, v. 2, No. 3, 2010, pp. 305 - 322), negative probabilities allow economists to overcome some shortcomings of the standard models. However, some problems demand other types of probabilistic tools. In this work, a mathematical theory of inflated probability, which may take larger than one values, is developed and its applications to financial problems in the context of the Black-Scholes-Merton framework are explained. Different properties of inflated probability are obtained. Some of these properties are similar to properties of the classical probability, while other properties are essentially different. (Received May 23, 2012)