**经济与管理学院-智能决策与风险分析研究所与国际交流处联合举办**

**European Interest Rate Option Pricing ---**

**A Perspective on Treatment of Negative Forward Rates**

By

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Dr. He于上海交通大学获得工程学士和硕士学位，在加拿大滑铁卢大学获得计量金融、数学以及工程方向的硕士以及博士学位。分别在加拿大蒙特利尔银行和加拿大皇家银行担任高级分析员、 经理、 高级顾问、高级经理、和主任等职。主管衍生产品定价模型鉴定, 包括固定收益衍生品, 固定收益与外汇混合衍生品股票和股指衍生品, 外汇和商品衍生品风险管理中的衍生品定价模型。

##### ABSTRACT

In most cases, it is assumed that a process of forward rates of a given index Interest Rate (IR) is strictly positive. Under this well accepted assumption by most practitioners, at least under normal market environment, we usually model the forward rate process by a CEV process. The most popular model assumption leads to a lognormal terminal distribution of an index IR rate at a future time. It is clear then that Negative Forward Rate (NFR) will be an issue in the model when it does occur. Based on current market situations, the

probability of the occurrence of NFR may be of small, however, we probably cannot afford the consequence if our model cannot handle NFR since some Profit/Loss (P&L) and risk numbers may be completely ruined, particularly for option products. From a mathematical modeling view point, it is not that complicated to tackle this issue. There are more than one alternative approaches to handle evaluation of options in cases of NFR.

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