

In this work we start from well-known closed formulas to price bonds using a popular model for the interest rate, the Vasicek model. We then expand these models by adding a two-factor stochastic volatility and following the work of J-P. Fouque, G. Papanicolaou, R. Sircar and K. Solna. In the latter, they use perturbation theory and asymptotic analysis to obtain closed formulas for the bond price.

Finally, we fit the model to Brazilian market data, confirming that the model with stochastic volatility, though more complicated, gets better results. The improvement on the results, however, does not come with an increased computational cost, since the closed formula obtained is simple and easy to implement, which is of great value to financial institutions.