



The University of Chicago
Department of Statistics

Master's Seminar

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**A Monte Carlo Approach to Price Colombian
Volatility Reducing Options**

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ABSTRACT

Colombian currency markets have evolved rapidly in the last 10 years. Since the introduction of a floating currency regime, the Colombian Central Bank has been using various methods to intervene the currency market with the purpose of controlling international reserves levels and volatility. One of such methods is to auction currency options. In this paper I explore volatility reducing options. These options are emitted when certain conditions are satisfied in the Colombian currency market. Additionally, they have early exercise features and conditions limiting the opportunity for them to be exercised. Hence, standard option pricing techniques (e.g. Black Scholes model) cannot be used to price them. Using geometric Brownian motion and Least Squares Monte Carlo (see Longstaff and Schwartz, 2001), I develop a new model to value such options. The model is then used to analyze the volatility reducing options past emission prices and the option holders exercising strategy. This shows that in the past volatility reducing options have been mispriced, allowing option buyers to benefit from the price. Additionally, a sensibility analysis on the volatility reducing options is made. Volatility and starting spot price are the two variables that have a greater impact in the option's price and optimal exercising strategy.