

Abstract: Main goal of this thesis is improvement of an order book model so that it behaved more realistically, based on a model developed by J. Plačková in her diploma thesis in 2011. We consider this simple model for evolution of order book in which limit orders of unit size arrive according to independent Poisson processes. Frequency of buy limit orders below resp. sell limit orders above a given price level is described by demand and supply functions. Buy (resp. sell) limit orders that arrive with price above (resp. below) the current ask (resp. bid) price are converted into market orders and cancellation of orders is not allowed. We extend this model by introducing market makers who place at the same time one buy and one sell limit order with current bid and ask prices. We show how introducing market makers reduces the spread that in the original model was unrealistically large and also show a method of calculating the precise rate of market makers needed to reduce the spread to zero.