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Xiaoyue Luo* (xluo@linfield.edu), 900 SE Baker St, McMinnville, OR 97128. *Application of generalized local regularization to an inverse problem in option pricing.*

We investigate the application of the recently developed generalized local regularization theory to a financial problem in option pricing. Our goal is to determine the volatility function from noisy call option prices. This is an important problem not only in theory but also for practitioners working in the financial world. However, there is simply not enough market data available to uniquely determine the value of the volatility function. Moreover, the solution of underlying functional does not depend continuously on the data. Consequently the problem of determining the volatility function is ill-posed. However, well-known regularization methods such as Tikhonov requires an appropriate a-priori guess of the volatility which may not be applicable in practice. To overcome these difficulties, we apply generalized local regularization method and show that our method does not require any a-priori estimate of the volatility. In addition, unlike other classical regularization methods, our method retains the causal structure of the original problem and allows for fast sequential numerical solution. We also give a parameter selection strategy coupled with our regularization method. Finally, we use examples to verify the effectiveness of our method. (Received September 04, 2014)