CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

METHODS TO SOLVE ASSET BUBBLE IN FINANCE

A thesis submitted in partial fulfillment of the requirements
For the degree of Master of Science in
Applied Mathematics

by

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Dedication

Jas' dedication

Acknowledgements

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ABSTRACT

METHODS TO SOLVE ASSET BUBBLE IN FINANCE

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We will study non parametric estimator Floren Zmirou in local real time on compact domain with stochastic differential equation which has unknown drift and diffusion coeificents. Once we will have volatility from floren zmirou. We will obtain volatility funtion then we will interpolate with cubic spline to see the behavior of the function.

Chapter 1

Numerical Solution, Conclusion and Future Work

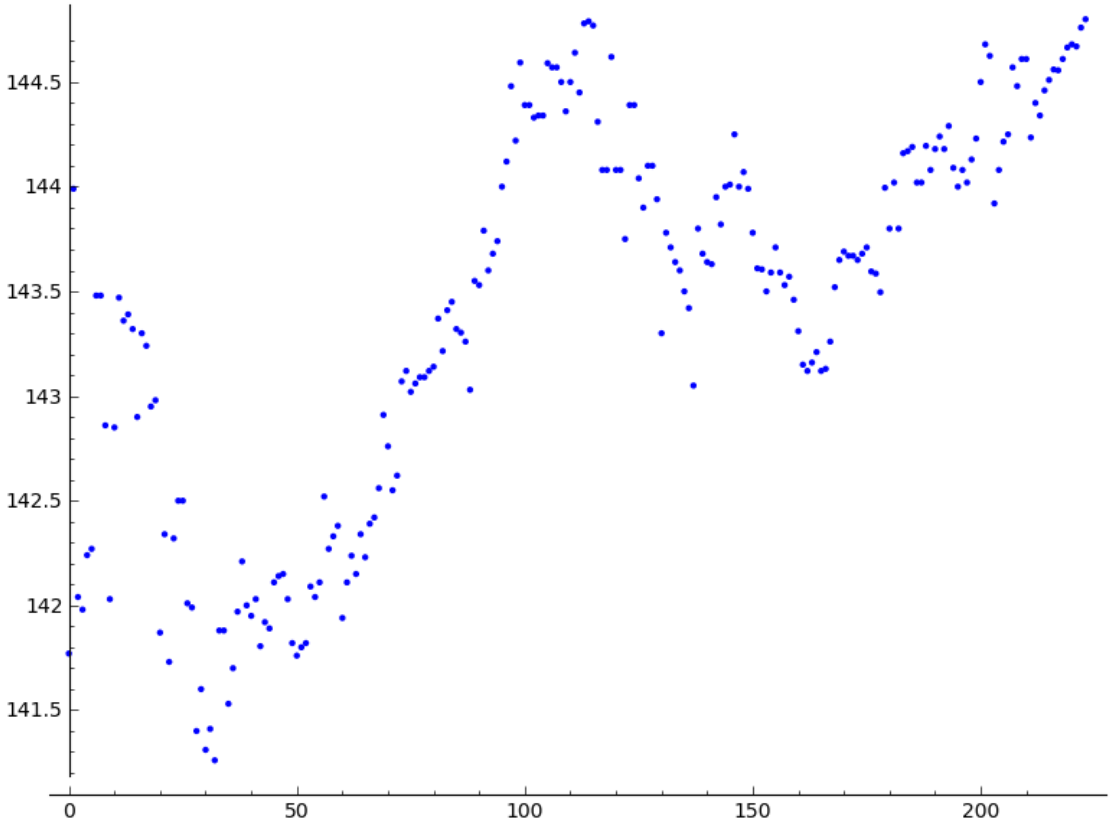
Since we have done lot of good work, now it is the time to check the implementation. We will provide examples which will give better understanding for our problem.

1.1 Numberical Solutions using implementation

Example 1

- Ticker: MWI Veterinary Supply Inc
- D : 05/16/2014
- T : 60 seconds
-

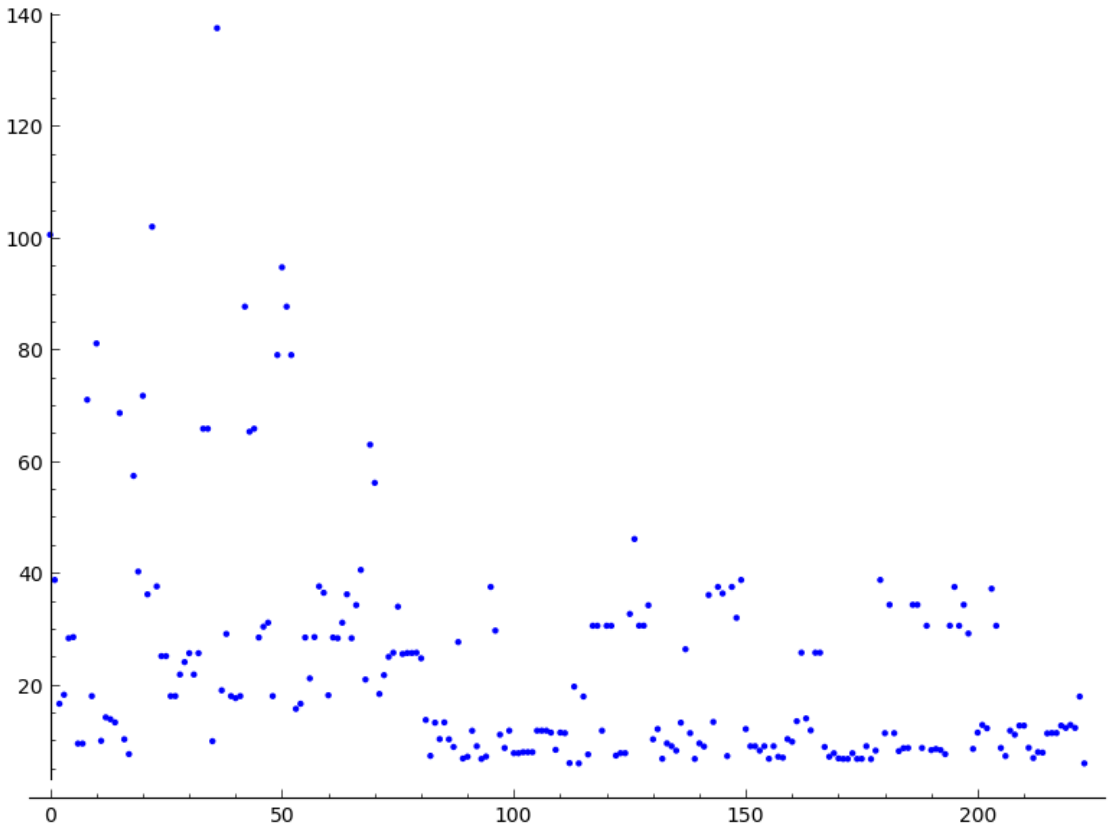
1.2 Stock Class



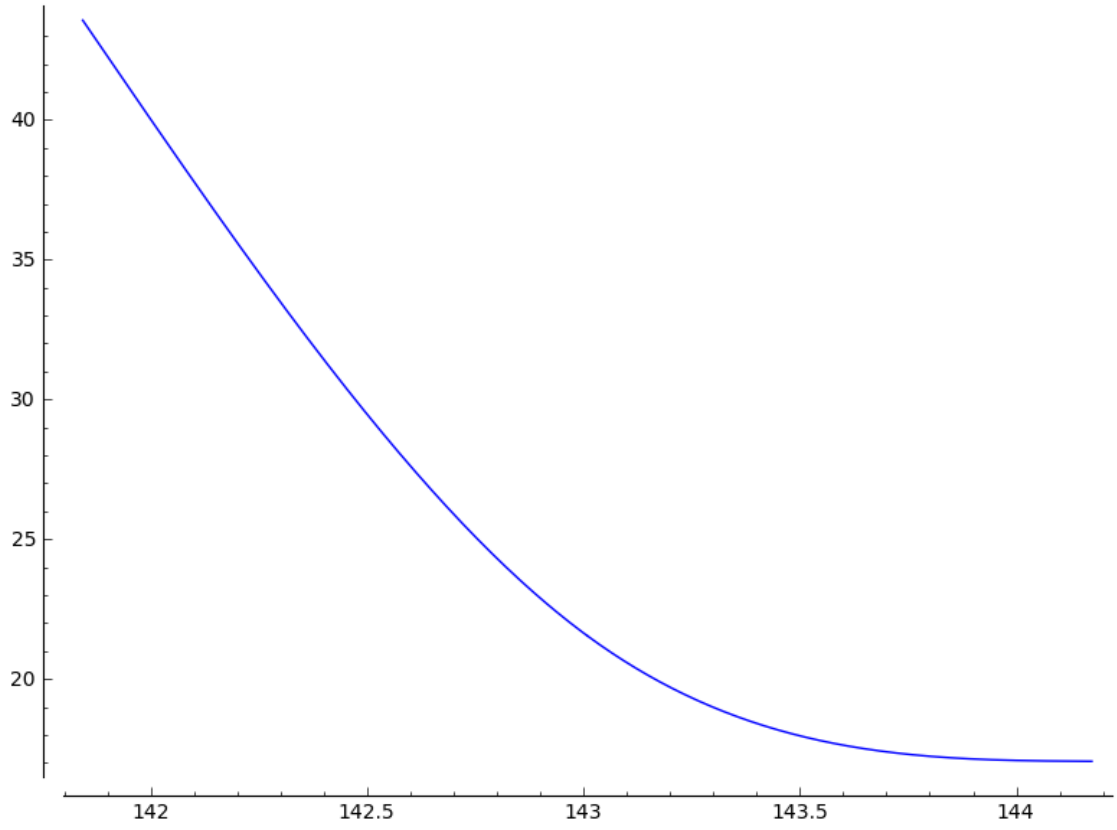
Usable Grid Points	Estimated Sigma Zmirou	Number of Points
141.842890874	1897.69862662	50
144.17445437	290.806107556	108
143.008672622	464.127160557	60

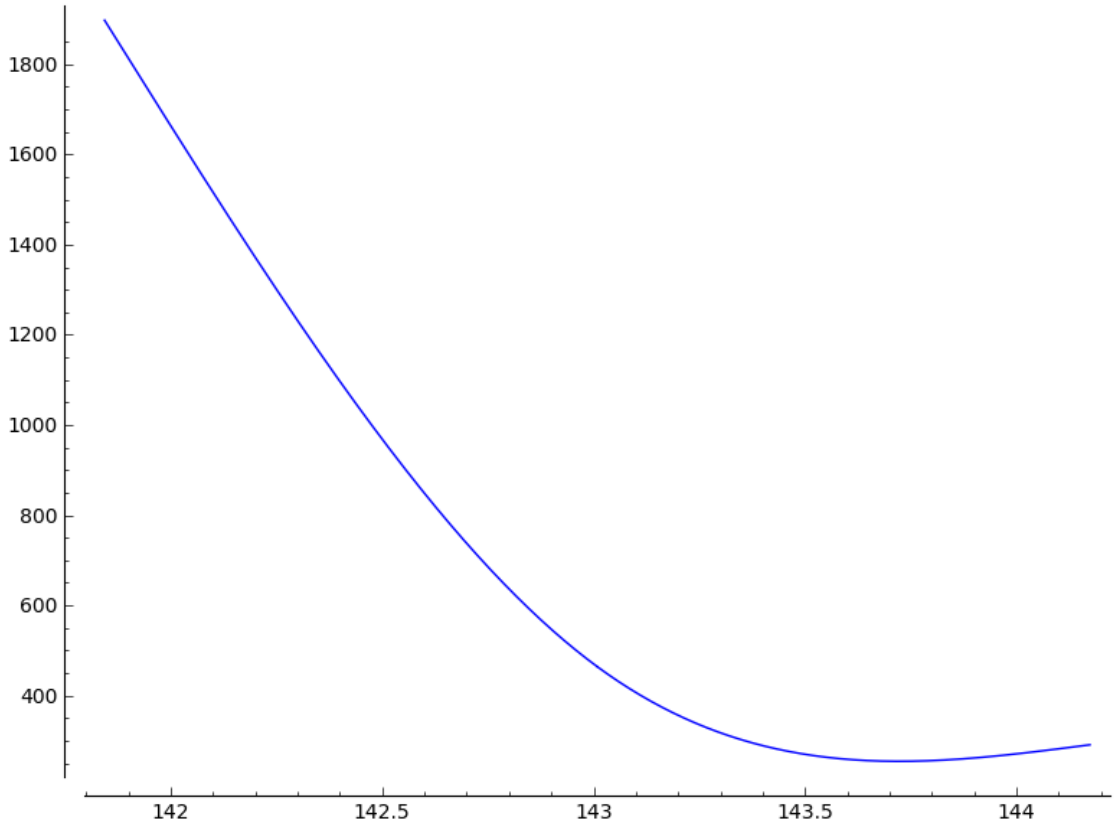
1.3 Floren Zmirou Estimation

$$S_n(x) = \frac{\Sigma_{i=1}^{n} 1_{\{|S_{t_i} - x| < h_n\}} n(S_{t_i+1} - S_{t_i})^2}{\Sigma_{i=1}^{n} 1_{\{|S_{t_i} - x| < h_n\}}} \tag{1.1}$$



1.4 Cublic Spline

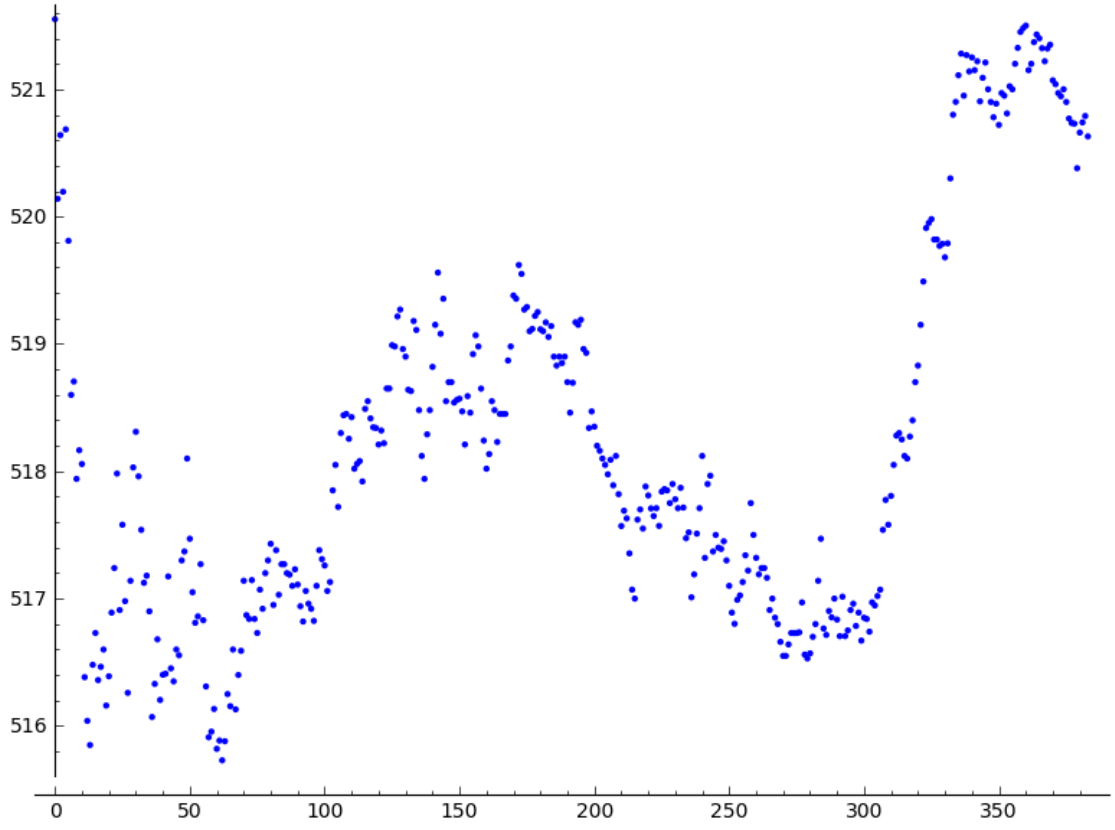



1800
1600
1400
1200
1000
800
600
400
142
142.5
143
143.5
144

Example 2

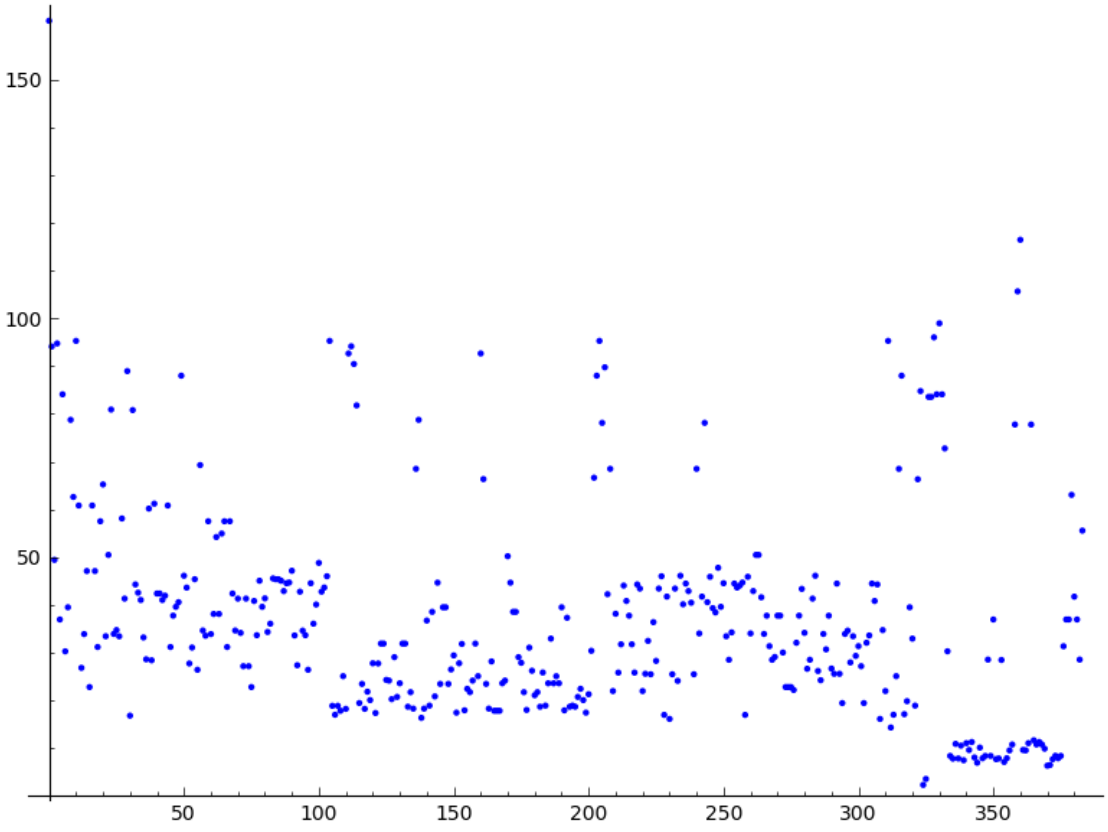
- Ticker: Google
- D : 05/16/2014
- T : 60 seconds
-

1.5 Stock Class



Usable Grid Points	Estimated Sigma Zmirou	Number of Points
516.530717358	1457.28946616	139
519.733586789	1665.54754231	49
518.132152074	1599.68642575	143
521.335021505	927.719546048	53

1.6 Floren Zmirou Class



1.7 Cubic Spline