**Project 2**

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Physics 250 Econophysics, Winter 2013

Below is the Matlab code used to generate the plots. Each plot has relevant values in the title.

%You will assume 1 trade (1 cluster) on each time step,

%and you will use 10,000,000 time steps

time\_step = 10.0e6;

%Need to generate a random number, p, between 0 and 1

p = rand(time\_step,1);

t = 2.857;

s = (p).^(-1/t); %s is the size of the trader-cluster

r = rand(time\_step,1);

r2 = rand();

phi = r<r2; % This generates a random binary array

phi = 2\*phi - 1; %This simple procedure produces a matrix with +1, and -1

delta\_P = s.\*phi;%multiplies two vectros element by element

mu = mean(delta\_P);

sigma = std(delta\_P);

x = (-200:.1:200);

new = histc(delta\_P,x);

new1 = log10(new);

HG = (time\_step)\*exp(-(1/2)\*((x-mu)/(sigma)).^2)/(sigma\*sqrt(2\*pi));

HG2 = log10(transpose(HG));

new2 = HG2>0;

HG2 = HG2.\*new2;

figure(2)

plot(x,HG2,x,new1)

title(['Histogram of 10e6 price changes,', '\mu =', num2str(mu),'\sigma =', num2str(sigma),'\tau =', num2str(t)])

ylabel('Log\_{10} H(\Delta P)')

xlabel('\Delta P')

legend('H(\Delta P`)','H(\Delta P)');

%set(gca, 'Yscale', 'log')

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