**Appendix**

**Matlab Code**

% miltivariate Newton's Method

s = 10.35;

k = [9, 9.5, 10, 10.5, 11];

p = [0.01, 0.02, 0.07, 0.28, 0.68];

sigma = [0.255, 0.2, 0.17, 0.183, 0.218];

x = s ./ k;

a\_init = [1;2;1];

% find A

for i = 0:2

for j = 0:2

A(i+1,j+1) = sum(x.^(i+j));

end

end

%find b

for i = 0:2

b(i+1) = sum(sigma .\* x.^i);

end

%Newton's Method

a0 = [0;0;0];

a = a\_init;

while (norm(a0 - a) > 0.001)

a0 = a;

s = A\(-A \* a + b');

a = a + s;

end

a

fx = a(1) + a(2).\*x + a(3) .\* x.^2;

plot(x, fx)

hold on;

plot(x, sigma)

legend('y=f(x)','sigma')

**Output:**



