APPENDIX A

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(1) Following MATLAB program computes power of the likelihood ratio test for testing shape parameter of ELN distribution when scale parameter is known.

```
sm1=0;sm2=0;
p=0;a2=2.4;
for d=1:2
        for n=1:1000
        global  q u1 u2 u3 u4 u5 u6 u7 u8 u9 b a;
        a1=a2;
        u=rand(1,25);
        u1=u.^(1/a1);
        x=exp(norminv(u1,3,1));
        y=logninv(u1,3,1);
        m1=2.5;
        u9=.0001;

        while (u9 > 0)
                m1=m1+0.1;
                u2=normcdf(log(x),m1,1);
                u3=log(u2);
                for j=1:25
                        b(j)=log(x(j))-m1;
                        q(j)=quadl('1./sqrt(2*pi).*exp(t.^2/(-2)).*t',-11,b(j));
                end
                u4=q./u2;
                a=-25/sum(u3);
                u9=(a-1)*sum(u4)+sum(b);
        end

                m1=m1-.1;
                u9=.0001;
        while (u9 > 0)
                m1=m1+0.01;
                u2=normcdf(log(x),m1,1);
                u3=log(u2);
                for j=1:25
                        b(j)=log(x(j))-m1;
```

```
                q(j)=quadl('1./sqrt(2*pi).*exp(t.^2/(-2)).*t',-11,b(j));
            end
            u4=q./u2;
            a=-25/sum(u3);
             u9=(a-1)*sum(u4)+sum(b);
        end

l=25*log(a)-sum(log(x))+(a-1)*sum(u3)+sum(log(lognpdf(x,m1,1)));
m2=sum(log(x))/25;
l0=sum(log(lognpdf(x,m2,1)))-sum(log(x));
        if -2*(l0-l) > 3.841
                p=p+1;
        end
end

        disp('The Power of the test is');
        power=p/1000
        a2=2.6;
end
```

(2) Following MATLAB program computes power of the likelihood ratio test for testing shape parameter of ELN distribution when location parameter is known.

```
p=0;
for n=1:1000
global  q u2 u3 u4 u5 u6 u7 s1 b a;
a=2.4;
u=rand(1,25);
u1=u.^(1/a);
x=exp(norminv(u1,0,2));
s1=1.5;u7=.0001;

while (u7 > 0)
   s1=s1+0.1;
   u2=normcdf(log(x),0,s1);
   u3=log(u2);
        for j=1:25
          b(j)=log(x(j))/s1;
          q(j)=quadl('1./(sqrt(2*pi)).*exp(-t.^2/2).*t.^2',-11,b(j));
        end
   u4=q./(u2.*s1);
   u5=log(x).*log(x);
```

```
    u6=u4./s1;
    a=-25/sum(u3);
    u7=(a-1)*sum(u6)-25*(a-1)/s1+sum(u5)/s1^3-25/s1;
  end

  u7=.01;s1=s1-.1;
  while (u7 > 0)
    s1=s1+0.01;
    u2=normcdf(log(x),0,s1);
    u3=log(u2);
          for j=1:25
            b(j)=log(x(j))/s1;
            q(j)=quadl('1./(sqrt(2*pi)).*exp(-t.^2/2).*t.^2',-11,b(j));
          end
    u4=q./u2;
    u5=log(x).*log(x);
    u6=u4./s1;
    a=-25/sum(u3);
    u7=(a-1)*sum(u6)-25*(a-1)/s1+sum(u5)/s1^3-25/s1;
  end

      l=25*log(a)-sum(log(x))+(a-1)*sum(u3)+sum(log(lognpdf(x,0,s1)));
      s0=sqrt(sum(log(x).^2)/25);
      l0=sum(log(lognpdf(x,0,s0)))-sum(log(x));
        if -2*(l0-l) > 3.841
          p=p+1;
        end
  end

  disp('The Power of the test is');
  power=p/1000
```

(3) Following MATLAB program computes asymptotic confidence interval for scale parameter for mixture of EE distribution and Degenerate distribution at zero for Vanmann data Schedule 1.

```
global  u1 u2 u3;
y=[0.0463741 0.0894855 0.4 0.43517 0.623441 0.6491 0.733446 1.35851
1.77112 1.86047 2.12125 2.12389];
p=.3;a=1.1815;l=0.9186;
n=40;r=1;s=0;
```

```
while (r <13)
   u1=y(r)*y(r);
   u2=(exp(-l*y(r)))^2;
   u3=(1-exp(-l*y(r)))^(a-3);
   s=s+u1*u2*u3;
   r=r+1;
end

f=p/l^2+a*(a-1)*l*p*s;
v=1/(n*f)
l-1.96*sqrt(v)
l+1.96*sqrt(v)
```

(4) Following MATLAB program computes asymptotic confidence interval for scale parameter for mixture of EE distribution and Degenerate distribution at zero for Vanmann data Schedule 2.

```
global  u1 u2 u3;
y=[0.116959 0.147126 1.04689 1.28773 1.47259 1.60173 2.00512 3.39663
3.63681 4.61681 4.9062 5.07603 5.59082 7.27442 7.90795 8.09091
9.37275 10.8699 11.9457 12.7577 14.5444 18.1969 19.4321 22.5941
25.7477 29.7297 32.4324];
p=.675;a=0.8952;l=10.5741;
n=40;r=1;s=0;

while (r <28)
   u1=y(r)*y(r);
   u2=(exp(-l*y(r)))^2;
   u3=(1-exp(-l*y(r)))^(a-3);
   s=s+u1*u2*u3;
   r=r+1;
end

f=p/l^2+a*(a-1)*l*p*s;
v=1/(n*f)
l-1.96*sqrt(v)
l+1.96*sqrt(v)
```