

APPENDIX B

- (5) Following MATLAB program computes MSE, Average Bias of MLE of R and coverage percentages and average length of bootstrap confidence interval for EG distribution.

```
a=2;b=4;ssr=0;bias=0;
c=0;len=0;ro=a/(a+b);
for l=1:500
global u1 u9 u2 u3 u4 u5 u6 u7 u8;
global v1 v9 v2 v3 v4 v5 v6 v7 v8;
n=5;
u=rand(1,15);v=rand(1,20);
u1=u.^(1/2);v1=v.^(1/4);
x=gaminv(u1,n,1/4);y=gaminv(v1,n,1/4);

u7=.0001; lam=3.3;
while (u7 > 0)
    lam=lam+.01;
    u2=gampdf(x,n,1/lam);v2=gampdf(y,n,1/lam);
    u1=gampdf(x,n+1,1/lam);v1=gampdf(y,n+1,1/lam);
    u3=gamcdf(x,n,1/lam);v3=gamcdf(y,n,1/lam);
    u4=log(u3);v4=log(v3);
    u5=gamcdf(x,n+1,1/lam);v5=gamcdf(y,n+1,1/lam);
    u6=(u5./u3)-1;v6=(v5./v3)-1;
    u9=(u1./u2)-1;v9=(v1./v2)-1;
    u8=sum(u4);v8=sum(v4);
    a=-15/u8;b=-20/v8;
    u7=(a-1)*(-n/lam*sum(u6))-(n/lam)*sum(u9)+(b-1)*(-n/lam*sum(v6))-
(n/lam)*sum(v9);
end
a1=a;b1=b;lama=lam;
for k=1:100
u=rand(1,15);v=rand(1,20);
u1=u.^(1/a1);v1=v.^(1/b1);
x=gaminv(u1,n,1/lama);y=gaminv(v1,n,1/lama);

u7=.0001;lam=3.3;
while (u7 > 0)
    lam=lam+.01;
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u2=gampdf(x,n,1/lam);v2=gampdf(y,n,1/lam);
u1=gampdf(x,n+1,1/lam);v1=gampdf(y,n+1,1/lam);
u3=gamcdf(x,n,1/lam);v3=gamcdf(y,n,1/lam);
u4=log(u3);v4=log(v3);
u5=gamcdf(x,n+1,1/lam);v5=gamcdf(y,n+1,1/lam);
u6=(u5./u3)-1;v6=(v5./v3)-1;
u9=(u1./u2)-1;v9=(v1./v2)-1;
u8=sum(u4);v8=sum(v4);
a=-15/u8;b=-20/v8;
u7=(a-1)*(-n/lam*sum(u6))-(n/lam)*sum(u9)+(b-1)*(-n/lam*sum(v6))-
(n/lam)*sum(v9);
end
a(k)=a;b(k)=b;lam(k)=lam;
r(k)=a(k)/(a(k)+b(k));
end
sr=sort(r);
if and(ro>=sr(3),ro<=sr(98))
    c=c+1;
end
len=len+(sr(98)-sr(3));
ssr=ssr+(mean(r)-ro)^2;
bias=bias+(mean(r)-ro);
end

disp('Results of Coverage, Average length, MSE, Average bias');
cov=c/500
avlen=len/500
mse=ssr/500
avbias=bias/500

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- (6) Following MATLAB program computes Power based on Asymptotic, Exact distribution of R & Non-parametric WMW_test for EGUM distribution.

```

a=2;
m1=10;m2=10;
for b=.2:.2:2
    ro=a/(a+b);
    p1=0;p2=0;p3=0;nosim=10000;
    for n=1:nosim
        global u1 u u2 u3 u4 a1 r;
        global v1 v v2 v3 v4 b1;

```

```

u=rand(1,m1);v=rand(1,m2);
u1=u.^(1/2);v1=v.^(1/b);
x=-log(-log(u1));y=-log(-log(v1));
f1=finv(1-.01,2*m1,2*m2);
u2=exp(-x);v2=exp(-y);
a1=m1/sum(u2);b1=m2/sum(v2);
c(n)=a1;d(n)=b1;
r(n)=c(n)/(c(n)+d(n));
f2=(0.25*sqrt((m1+m2)/(m1*m2)))*2.3263);
if (r(n)-0.5)>f2
    p1=p1+1;
end
if (r(n)/(1-r(n)))>f1
    p2=p2+1;
end
[p,h]=ranksum(x,y,0.01);
if h>0
    p3=p3+1;
end
end

disp('The Power based on Asymp. & Exact dist. are ');
asymp=p1/10000
exactp=p2/10000
disp('The Power based on Non-parametric MWW_test');
nparp=p3/10000
end

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