***Additional Topics***

***Additional Mathematics Topics in General insurance (property and liabiloity)***

1. ***Net or Pure Premium***

If the loss distribution follows *the normal distribution*, the pure premium P will be calculated as follow:

**P =  + z %9.99**

If the number of insured = 1 then:

P1 = x1 + **z** %9.99 where **z% 9.99** is the standard value for the confidence degree 99.9% & z = 3.09 (we will approximate it to 3 to facilitate the calculation).

P2 = 2 + **z** %9.99

P3 = 3 + **z** %9.99

P100 = 100 + **z** %9.99

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P1000 = 1000 + **z** %9.99

P10000 = 10000 + **z** %9.99

P1000000 = 1000000 + **z** %9.99

***Example***

Based on the previous value of  =1000 & =1500 then

**If n = 1 (**i.e. if there is only one insured), then the premium for one insured would be:

P1 = 1 + **z** %9.99

P1 = 1000 + **3** = 1000 + 4500 =5500

If n = 2 (i.e. if there are only two insureds), then the premium for two insureds would be:

P2 = 2 + **z** %9.99

P2 = 1000×2 + × ) × 3)

= 2000 + ((1500× 1.4142) ×3)

=2000 + 6363.96 =8363.96

Then the premium for each insured = = = 4141.98

If n = 3 (i.e. if there are only three insureds) then the premium for three insureds would be:

P3 = 3 + **z** %9.99

P3 = 1000× 3 + × ) × 3)

=3000 + ((1500× 1.732051) ×3)

= 3000 + 7794.23 = 10794.23

Then the premium for each insured = = = = 3598.08

**If n = 100** (i.e. if there are100 insureds) then the premium for 100 insureds would be:

P100 = 100 + **z** %9.99

P100 = 1000× 100 + × ) × 3)

= 100000 + ((1500× 10) ×3)

= 1000000 +45000 = 145000

Then the premium for each insured = = = 1450

**If n = 10000** (i.e. if there is 10000 insureds), then the premium for 10000 insureds would be:

P10000 = 10000 + **z** %9.99

P10000 = 1000× 10000+ × ) × 3)

= 10000000+ ((1500× 100) ×3)

= 10000000 +450000 = 145000 = 10450000

Then the premium for each insured = = = 1045

**If n = 1.000.000** (i.e. if there are 1000000 insureds), then the premium for 1000000 insureds would be:

P1000000 = 1000000 + **z** %9.99

P1000000  = (1000× 1000000) + × ) × 3)

= 1000000000+ ((1500× 1000) ×3)

= 1000000000 +4500000 = 145000 = 1004500000

***Then* the net premium for each insured** = = = 1004.5

And,

**The gross premium =**

Given = 30 %

So, **the gross premium** = =1435 (1004.2 pure premium and 430.5 loadings).