Selecting the Proper Tools of Risk management

Example:

- **Suppose that a business is exposed to accidental property losses (fire) that are described by the following PD:**

Loss	0	3000	30000	60000	300000
Prob.	0.700	0.160	0.120	0.018	0.002

- ***Further assume that the risk manager must decide among of five courses of action:***

1) Retain the possible accident losses.

2) Retain the possible accident losses, but introduce some loss control measure (sprinkler) with cost $2,500 that will change the probabilities in the above prob. dist.as follow:

Loss	0	2,000	23,000	52,000	260,000
Prob.	0.800	0.100	0.090	0.009	0.001

3) Purchase an insurance policy that will cover accidental losses up to $30,000 for a prem. $6,840.

4) Purchase an insurance policy that will cover accidental losses up to $300,000 but not the first $3,000 (deductible) for a prem. $7,080.

5) Purchase an insurance policy that will cover all losses for a prem. $8,400.

- ***<u>As a risk manager, determine the proper tool using:</u>***

A)The minimum expected tangible loss criteria.

B)The worry method (total losses; tangible & intangible losses) if the cost of worry (or anxiety) the risk manager assigned respectively are:

4,000 , 3,000 , 2,000 , 500 , 0

A) The minimum expected tangible loss criteria.

- **Tangible losses matrix**

Loss:	0	3,000	30,000	60,000	300,000
Prob.:	0.700	0.160	0.120	0.018	0.002

1-Retention:

Loss:	0	3,000	30,000	60,000	300,000
Cost:	0	3,000	30,000	60,000	300,000

1-The expected tangible loss of the first tool =

(0 x 0.7) + (3,000 x 0.16) + (30,000 x 0.12) + (60.000 x 0.018) + (300,000 x 0.002) = 5,760

- **Tangible losses matrix**

Loss:	0	2,000	23,000	52,000	260,000
Prob.:	0.800	0.100	0.090	0.009	0.001

2-Retention with loss control with cost $ 2,500:

Loss:	0	2,000	23,000	52,000	260,000
Cost:	0	2,000	23,000	52,000	260,000

2-The expected tangible loss of the second tool = (0 x 0.8) + (2,000 x 0.1) + (23,000 x 0.09) + (52,000 x 0.009) + (260,000 x 0.001) + 2,500 = **5,498**

Tangible losses matrix

Loss:	0	3,000	30,000	60,000	300,000
Prob.:	0.700	0.160	0.120	0.018	0.002

3-Insurance up to $ 30,000 for $ 6,840 prem.:

Loss:	0	3,000	30,000	60,000	300,000
Cost:	0	0	0	30,000	270,000

3-The expected tangible loss of the third tool = (0 x 0.7) + (0 x 0.16) + (0 x 0.12) + (30,000 x 0.018) + (270,000 x 0.002) + 6,840 = **7,920**

Tangible losses matrix

Loss:	0	3,000	30,000	60,000	300,000
Prob.:	0.700	0.160	0.120	0.018	0.002

4-Insurance up to $ 300,000 with $ 3,000 deductible for $ 7,080 prem.:

Loss:	0	3,000	30,000	60,000	300,000
T.C.:	0	3,000	3,000	3,000	3,000

4-The expected tangible loss of the fourth tool =

(0 x 0.7) + (3,000 x 0.16) + (3,000 x 0.12) + (3,000 x 0.018) + (3,000 x 0.002) + 7,080= **$7,980**

Tangible losses matrix

Loss:	0	3,000	30,000	60,000	300,000
Prob.:	0.700	0.160	0.120	0.018	0.002

5- Insurance up to $ 300,000 (full insurance) for $ 8,400 prem.:

Loss:	0	3,000	30,000	60,000	300,000
T.C.:	0	0	0	0	0

5-The expected tangible loss of the fifth tool =

(0 x 0.7) + (0 x 0.16) + (0 x 0.12) + (0 x 0.018) + (0 x 0.002) + 8,400 = **8,400**

A) The minimum expected tangible loss criteria:

1-The expected tangible loss of the 1st tool = 5,760

2-The expected tangible loss of the 2nd tool = 5,498

3-The expected tangible loss of the 3rd tool = 7,920

4-The expected tangible loss of the 4th tool = 7,980

5-The expected tangible loss of the 5th tool = 8,400

- **Then the proper tool under the expected tangible loss criteria is the second one (Retention with loss control).**

B) The worry method (total losses; tangible and intangible losses):

1-The expected total loss (tangible and intangible loss) of the 1st tool =5,760 + 4,000 = 9,760

2-The expected total loss (tangible and intangible loss) of the 2nd tool = 5,498 + 3,000 = 8,498

3-The expected total loss (tangible and intangible loss) of the 3rd tool = 7,920 +2,000 = 9,920

4-The expected total loss (tangible and intangible loss) of the 4rth tool = 7,980 + 500 = 8,480

5-The expected total loss (tangible and intangible loss) of the 5th tool = 8,400 + 0 = 8,400

- Then the optimal tool under the worry method (expected total loss) criteria is the 5th one (full insurance).