Reading: Bahnemann.Chapter6 Bahnemann_Consistency (Problem 1)
Model: Source Text
Problem Type: Check increased limits factors for consistency

Given

Per Occurrence Limit	Increased Limit Factor
$100,000	1.000
$200,000	1.240
$250,000	1.340
$500,000	1.515
$1,000,000	1.915

Find Determine if the ILFs satisfy the consistency test, and if not then identify the range of factors which would work.

Solution

We need to measure the incremental rate as coverage increases and then check that the amounts decrease

	Per Occurrence Limit, L	ILF	Marginal Rate per $1,000 Coverage
(a)	$100,000	1.000	NA
(b)	$200,000	1.240	0.0024
(c)	$250,000	1.340	0.0020
(d)	$500,000	1.515	0.0007
(e)	$1,000,000	1.915	0.0008

Sample calculation:

Marginal rate (c) = $(ILF_c - ILF_b) / [(L_c - L_b) / 1{,}000]$

The increased limit factors FAIL the consistency test because the marginal rate does not always decrease.

Observe the marginal rate for row (e) is greater than the marginal rate for row (d). This is why the test failed.
To correct it, we need the marginal rate for row (e) to be less than or equal to the marginal rate for row (d).
So we need

$(ILF_e - ILF_d) / [(L_e - L_d) / 1{,}000] \quad \leq 0.0007$

That is,

$ILF_e \leq 0.0007 * ((Le - Ld) / 1{,}000) + ILFd$

$= 1.865$

However, to avoid illogical rating, we also require $ILF_e \geq ILF_d$

So the acceptable range of values for ILF_e is

$1.515 < ILFe < 1.865$

Reading: Bahnemann.Chapter6 Bahnemann_Consistency (Problem 2)
Model: Source Text
Problem Type: Check increased limits factors for consistency

Given

Per Occurrence Limit	Increased Limit Factor
$100,000	1.000
$200,000	1.470
$300,000	1.820
$500,000	2.280
$1,000,000	3.830

Find Determine if the ILFs satisfy the consistency test, and if not then identify the range of factors which would work.

Solution

We need to measure the incremental rate as coverage increases and then check that the amounts decrease

	Per Occurrence Limit, L	ILF	Marginal Rate per $1,000 Coverage
(a)	$100,000	1.000	NA
(b)	$200,000	1.470	0.0047
(c)	$300,000	1.820	0.0035
(d)	$500,000	2.280	0.0023
(e)	$1,000,000	3.830	0.0031

Sample calculation:

Marginal rate (c) = $(ILF_c - ILF_b) / [(L_c - L_b) / 1,000]$

The increased limit factors FAIL the consistency test because the marginal rate does not always decrease.

Observe the marginal rate for row (e) is greater than the marginal rate for row (d). This is why the test failed.
To correct it, we need the marginal rate for row (e) to be less than or equal to the marginal rate for row (d).
So we need

$(ILF_e - ILF_d) / [(L_e - L_d) / 1,000] \quad \leq 0.0023$

That is,

$ILF_e \leq 0.0023 * ((Le - Ld) / 1,000) + ILFd$

$= 3.430$

However, to avoid illogical rating, we also require $ILF_e \geq ILF_d$

So the acceptable range of values for ILF_e is

$2.28 < ILFe < 3.43$