Reading: Klann.ReinsComm (tax effect HARD - Ex A) x-Question
Model: 2017.Spring #26b
Problem Type: change in taxable income

Given The following pertains to a reinsurance contract that was commuted:

quota-share percentage	30%		
primary insurer RESERVE direct (gross)	1,210,000	=	${}_pR^-_{gross}$
primary insurer ULTIMATE direct (gross)	1,830,000	=	${}_pU^-_{gross}$
discount factor for primary insurer	0.900		
discount factor for reinsurer	0.810		

REINSURER'S carried loss reserves (prior to commutation)
are higher than the INSURED'S carried reserves by: -9%

REINSURER'S ultimate loss reserves, as a result of
commutation, increased by: 11%

Find change in taxable income for both insurer and reinsurer

Notation

P	=	commutation price
${}_pR^-_{ceded}$	=	CEDED carried reserve for primary insurer
${}_{re}R^-_{gross}$	=	GROSS carried reserve for reinsurer
d_1	=	discount factor for primary insurer
d_2	=	discount factor for reinsurer

Formulas

change in taxable income for primary insurer	=	price - $({}_pR^-_{ceded}) \times d_1$
change in taxable income for reinsurer	=	$({}_{re}R^-_{gross}) \times d_2$ - price

insurer	=	60,426	*(increase)*
reinsurer	=	-119,559	*(decrease)*

(tax effect HARD - Ex A) y-Answer

30% quota-share reinsurance means that 30% is CEDED to reinsurer:

$_pR^-_{ceded}$	=	$_pR^-_{gross}$	x	***qs%***		
	=	1,210,000	x	30%	=	363,000
$_{re}R^-_{gross}$	=	$_pR^-_{ceded}$	x	0.91		
		363,000	x	0.91	=	330,330

The hard part of this problem is calculating the commutation price P:

$_pP^-_{gross}$ =	primary insurer PAID LOSS direct	=	$_pU^-_{gross}$	-	$_pR^-_{gross}$	
		=	1,830,000	-	1,210,000	
		=	620,000			
$_pP^-_{ceded}$ =	primary insurer PAID LOSS ceded	=	$_pP^-_{gross}$	x	***qs%***	
(also equals $_{re}P^-_{gross}$*)*			620,000	x	30%	
		=	186,000			
		=	$_{re}P^-_{gross}$	(reinsurer PAID LOSS gross)		
$_{re}U^-_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}P^-_{gross}$	+	$_{re}R^-_{gross}$	
		=	186,000	+	330,330	
		=	516,330			

But this is the GROSS ultimate loss PRIOR to commutation. **AFTER** commutation, we have:

$_{re}U^+_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}U^-_{gross}$	x	111%
			516,330	x	111%
		=	573,126		

now, reinsurer's reserve goes to 0, and the "extra" money in the ultimate must be the commutation price:

	price	=	573,126	-	186,000
		=	387,126		

We now have what we need to substitute into the **given formulas** for change in taxable income:

change in taxable income for primary insurer	=	60,426	*(increase)*
change in taxable income for reinsurer	=	-119,559	*(decrease)*

Reading: Klann.ReinsComm (tax effect HARD - Ex B) x-Question
Model: 2017.Spring #26b
Problem Type: change in taxable income

Given The following pertains to a reinsurance contract that was commuted:

quota-share percentage	25%		
primary insurer RESERVE direct (gross)	1,350,000	=	${}_pR^-_{gross}$
primary insurer ULTIMATE direct (gross)	2,130,000	=	${}_pU^-_{gross}$
discount factor for primary insurer	0.810		
discount factor for reinsurer	0.890		

REINSURER'S carried loss reserves (prior to commutation)
are higher than the INSURED'S carried reserves by: -5%

REINSURER'S ultimate loss reserves, as a result of
commutation, increased by: 15%

Find change in taxable income for both insurer and reinsurer

Notation

P	=	commutation price
${}_pR^-_{ceded}$	=	CEDED carried reserve for primary insurer
${}_{re}R^-_{gross}$	=	GROSS carried reserve for reinsurer
d_1	=	discount factor for primary insurer
d_2	=	discount factor for reinsurer

Formulas

change in taxable income for primary insurer	=	price - $({}_pR^-_{ceded}) \times d_1$
change in taxable income for reinsurer	=	$({}_{re}R^-_{gross}) \times d_2$ - price

insurer	=	124,594	*(increase)*
reinsurer	=	-112,613	*(decrease)*

(tax effect HARD - Ex B) y-Answer

25% quota-share reinsurance means that 25% is CEDED to reinsurer:

$_pR^-_{ceded}$	=	$_pR^-_{gross}$	x	***qs%***		
	=	1,350,000	x	25%	=	337,500
$_{re}R^-_{gross}$	=	$_pR^-_{ceded}$	x	0.95		
		337,500	x	0.95	=	320,625

The hard part of this problem is calculating the commutation price P:

$_pP^-_{gross}$ =	primary insurer PAID LOSS direct	=	$_pU^-_{gross}$	-	$_pR^-_{gross}$	
		=	2,130,000	-	1,350,000	
		=	780,000			
$_pP^-_{ceded}$ =	primary insurer PAID LOSS ceded	=	$_pP^-_{gross}$	x	***qs%***	
(also equals $_{re}P^-_{gross}$*)*			780,000	x	25%	
		=	195,000			
		=	$_{re}P^-_{gross}$	(reinsurer PAID LOSS gross)		
$_{re}U^-_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}P^-_{gross}$	+	$_{re}R^-_{gross}$	
		=	195,000	+	320,625	
		=	515,625			

But this is the GROSS ultimate loss PRIOR to commutation. **AFTER** commutation, we have:

$_{re}U^+_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}U^-_{gross}$	x	115%
			515,625	x	115%
		=	592,969		

now, reinsurer's reserve goes to 0, and the "extra" money in the ultimate must be the commutation price:

	price	=	592,969	-	195,000
		=	397,969		

We now have what we need to substitute into the **given formulas** for change in taxable income:

change in taxable income for primary insurer	=	124,594	*(increase)*
change in taxable income for reinsurer	=	-112,613	*(decrease)*