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	45%		
primary insurer RESERVE direct(net)	1,390,000	=	${}_pR^-_{gross}$
primary insurer ULTIMATE direct(net)	2,010,000	=	${}_pU^-_{gross}$
discount factor for primary insurer	0.910		
discount factor for reinsurer	0.820		

REINSURER'S carried loss reserves (prior to commutation)
are higher than the INSURED'S carried reserves by: -2%

REINSURER'S ultimate loss, as a result of
commutation, increased by: 6%

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	=	97,304	*(increase)*
reinsurer	=	-163,858	*(decrease)*

(tax effect HARD - Ex A) y-Answer

45% quota-share reinsurance means that 45% is CEDED to reinsurer:

$_pR^-_{ceded}$	=	$_pR^-_{gross}$	x	***qs%***		
	=	1,390,000	x	45%	=	625,500
$_{re}R^-_{gross}$	=	$_pR^-_{ceded}$	x	0.98		
		625,500	x	0.98	=	612,990

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

$_pP^-_{gross}$ =	primary insurer PAID LOSS direct	=	$_pU^-_{gross}$	-	$_pR^-_{gross}$	
		=	2,010,000	-	1,390,000	
		=	620,000			
$_pP^-_{ceded}$ =	primary insurer PAID LOSS ceded	=	$_pP^-_{gross}$	x	***qs%***	
(also equals $_{re}P^-_{gross}$*)*			620,000	x	45%	
		=	279,000			
		=	$_{re}P^-_{gross}$	(reinsurer PAID LOSS gross)		
$_{re}U^-_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}P^-_{gross}$	+	$_{re}R^-_{gross}$	
		=	279,000	+	612,990	
		=	891,990			

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	106%
			891,990	x	106%
		=	945,509		

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

	price	=	945,509	-	279,000
		=	666,509		

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

change in taxable income for primary insurer	=	97,304	*(increase)*
change in taxable income for reinsurer	=	-163,858	*(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	65%		
primary insurer RESERVE direct(net)	1,250,000	=	${}_pR^-_{gross}$
primary insurer ULTIMATE direct(net)	2,020,000	=	${}_pU^-_{gross}$
discount factor for primary insurer	0.920		
discount factor for reinsurer	0.920		

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

REINSURER'S ultimate loss, as a result of
commutation, increased by: 19%

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	=	227,451	*(increase)*
reinsurer	=	-294,726	*(decrease)*

(tax effect HARD - Ex B) y-Answer

65% quota-share reinsurance means that 65% is CEDED to reinsurer:

$_pR^-_{ceded}$	=	$_pR^-_{gross}$	x	***qs%***		
	=	1,250,000	x	65%	=	812,500
$_{re}R^-_{gross}$	=	$_pR^-_{ceded}$	x	0.91		
		812,500	x	0.91	=	739,375

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

$_pP^-_{gross}$ =	primary insurer PAID LOSS direct	=	$_pU^-_{gross}$	-	$_pR^-_{gross}$	
		=	2,020,000	-	1,250,000	
		=	770,000			
$_pP^-_{ceded}$ =	primary insurer PAID LOSS ceded	=	$_pP^-_{gross}$	x	***qs%***	
(also equals $_{re}P^-_{gross}$ *)*			770,000	x	65%	
		=	500,500			
		=	$_{re}P^-_{gross}$	(reinsurer PAID LOSS gross)		
$_{re}U^-_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}P^-_{gross}$	+	$_{re}R^-_{gross}$	
		=	500,500	+	739,375	
		=	1,239,875			

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	119%
			1,239,875	x	119%
		=	1,475,451		

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

	price	=	1,475,451	-	500,500
		=	974,951		

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

change in taxable income for primary insurer	=	227,451	*(increase)*
change in taxable income for reinsurer	=	-294,726	*(decrease)*