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	25%		
primary insurer DIRECT loss reserve	1,250,000	=	${}_pR^-_{gross}$
primary insurer DIRECT ultimate loss	2,550,000	=	${}_pU^-_{gross}$
discount factor for primary insurer	0.875		
discount factor for reinsurer	0.875		

REINSURER'S carried loss reserves (prior to commutation)
are higher than the INSURED'S carried reserves by: 15%

REINSURER'S ultimate loss, as a result of
commutation, increased by: 10%

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	=	154,375	*(increase)*
reinsurer	=	-113,359	*(decrease)*

(tax effect HARD - Ex A) y-Answer

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

$_pR^-_{ceded}$	=	$_pR^-_{gross}$	x	***qs%***		
	=	1,250,000	x	25%	=	312,500
$_{re}R^-_{gross}$	=	$_pR^-_{ceded}$	x	1.15		
		312,500	x	1.15	=	359,375

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

$_pP^-_{gross}$ =	primary insurer PAID LOSS direct	=	$_pU^-_{gross}$	-	$_pR^-_{gross}$	
		=	2,550,000	-	1,250,000	
		=	1,300,000			
$_pP^-_{ceded}$ =	primary insurer PAID LOSS ceded	=	$_pP^-_{gross}$	x	***qs%***	
(also equals $_{re}P^-_{gross}$*)*			1,300,000	x	25%	
		=	325,000			
		=	$_{re}P^-_{gross}$	(reinsurer PAID LOSS gross)		
$_{re}U^-_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}P^-_{gross}$	+	$_{re}R^-_{gross}$	
		=	325,000	+	359,375	
		=	684,375			

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	110%
			684,375	x	110%
		=	752,813		

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

	price	=	752,813	-	325,000
		=	427,813		

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

change in taxable income for primary insurer	=	154,375 *(increase)*
change in taxable income for reinsurer	=	-113,359 *(decrease)*