Reading: Klann.ReinsComm (tax effect HARD - Ex 1) 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	70%		
primary insurer RESERVE direct(net)	1,100,000	=	${}_pR^-_{gross}$
primary insurer ULTIMATE direct(net)	1,900,000	=	${}_pU^-_{gross}$
discount factor for primary insurer	0.820		
discount factor for reinsurer	0.880		

REINSURER'S carried loss reserves (prior to commutation)
are higher than the INSURED'S carried reserves by: -6%

REINSURER'S ultimate loss reserves, as a result of
commutation, increased by: -5%

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	=	28,210	*(increase)*
reinsurer	=	-22,666	*(decrease)*

(tax effect HARD - Ex 1) y-Answer

70% quota-share reinsurance means that 70% is CEDED to reinsurer:

$_pR^-_{ceded}$	=	$_pR^-_{gross}$	x	***qs%***		
	=	1,100,000	x	70%	=	770,000
$_{re}R^-_{gross}$	=	$_pR^-_{ceded}$	x	0.94		
		770,000	x	0.94	=	723,800

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

$_pP^-_{gross}$ =	primary insurer PAID LOSS direct	=	$_pU^-_{gross}$	-	$_pR^-_{gross}$	
		=	1,900,000	-	1,100,000	
		=	800,000			
$_pP^-_{ceded}$ =	primary insurer PAID LOSS ceded	=	$_pP^-_{gross}$	x	***qs%***	
(also equals $_{re}P^-_{gross}$*)*			800,000	x	70%	
		=	560,000			
		=	$_{re}P^-_{gross}$	(reinsurer PAID LOSS gross)		
$_{re}U^-_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}P^-_{gross}$	+	$_{re}R^-_{gross}$	
		=	560,000	+	723,800	
		=	1,283,800			

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	95%
			1,283,800	x	95%
		=	1,219,610		

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

	price	=	1,219,610	-	560,000
		=	659,610		

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

change in taxable income for primary insurer	=	28,210	*(increase)*
change in taxable income for reinsurer	=	-22,666	*(decrease)*

Reading: Klann.ReinsComm (tax effect HARD - Ex 2) 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(net)	1,200,000	=	$_pR^-_{gross}$
primary insurer ULTIMATE direct(net)	1,840,000	=	$_pU^-_{gross}$
discount factor for primary insurer	0.860		
discount factor for reinsurer	0.910		

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

REINSURER'S ultimate loss reserves, as a result of
commutation, increased by: 4%

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	=	79,968	*(increase)*
reinsurer	=	-55,416	*(decrease)*

(tax effect HARD - Ex 2) y-Answer

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

$_pR^-_{ceded}$	=	$_pR^-_{gross}$	x	***qs%***		
	=	1,200,000	x	30%	=	360,000
$_{re}R^-_{gross}$	=	$_pR^-_{ceded}$	x	1.02		
		360,000	x	1.02	=	367,200

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

$_pP^-_{gross}$ =	primary insurer PAID LOSS direct	=	$_pU^-_{gross}$	-	$_pR^-_{gross}$	
		=	1,840,000	-	1,200,000	
		=	640,000			
$_pP^-_{ceded}$ =	primary insurer PAID LOSS ceded	=	$_pP^-_{gross}$	x	***qs%***	
(also equals $_{re}P^-_{gross}$*)*			640,000	x	30%	
		=	192,000			
		=	$_{re}P^-_{gross}$	(reinsurer PAID LOSS gross)		
$_{re}U^-_{gross}$ =	reinsurer ULTIMATE LOSS gross	=	$_{re}P^-_{gross}$	+	$_{re}R^-_{gross}$	
		=	192,000	+	367,200	
		=	559,200			

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	104%
			559,200	x	104%
		=	581,568		

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

	price	=	581,568	-	192,000
		=	389,568		

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

change in taxable income for primary insurer	=	79,968	*(increase)*
change in taxable income for reinsurer	=	-55,416	*(decrease)*