Real Estate Financial Modeling – Certification Quiz Questions

Module 6 – 2-Hour Pre-Sold Condo Development Modeling Test (Heritage Cyrela)

1. **You are working on a model for a pre-sold condominium development in Brazil. The finished property will have 19,209 square meters of condo units, with an average size of 582 square meters. The Developers plan to finish construction in 3.5 years and open the property for move-ins just before Year 4 begins.**

   The units will be pre-sold before construction is complete, with 10-12 units for sale in each phase. Construction in each phase is expected to last for 24 months. Clients will make upfront payments, payments when construction ends, and final payments upon move-in. Fifty percent (50%) or more of total units in the property must be sold before Construction Loan Draws are allowed; before that, the funding will be 100% Equity.

   Some of the market and operational assumptions change in the different scenarios (Base, Upside, and Downside), while others stay the same. Several of the key assumptions are shown below:

Operating Scenario:	*Name*	Base			
			Operating Cases:		
Assumption:		**Selected Case:**	**Downside**	**Base**	**Upside**
Sales Velocity per Month:	*# Units*	1.0	0.5	1.0	1.5
Annual Sales Price Inflation:	*%*	2.5%	1.0%	2.5%	4.0%
Annual Expense Inflation:	*%*	2.5%	2.0%	2.5%	3.0%

Financial Assumptions:	***Units:***	
Lot Price per Square Meter:	*R$ / sq. m.*	R$ 3,000
Lot Asking Price:	*R$*	R$ 16,007,500
Lot Upfront Payment %:	*%*	50.0%
Month # for Upfront Payment:	*Month #*	1
Month # for Remainder of Payment:	*Month #*	6
% of Units Pre-Sold Before Loan Draw:	*%*	50.0%
Construction Loan Interest Rate:	*%*	10.00%
Upfront Client Payment:	*%*	30.0%
Client Payment Upon Construction End:	*%*	30.0%
Client Payment Upon Building Move-In:	*%*	40.0%
% Units Pre-Sold for Construction to Begin:	*%*	30.0%
% Units Pre-Sold for Next Phase to Begin:	*%*	70.0%
# Months in Construction Period:	*# Months*	24
Condo Selling Price per Square Meter:	*R$ / sq. m.*	R$ 28,000
Hard Costs per Gross Square Meter:	*R$ / sq. m.*	15,000
Soft Costs per Gross Square Meter:	*R$ / sq. m.*	3,500
FF&E and Move-In Costs % Monthly Sales:	*%*	10.0%

What is the BIGGEST potential issue with these market and operational assumptions?

a. We are not considering different Condo Selling Prices and Hard Costs in the Base, Upside, and Downside cases, which greatly limits the range of outcomes.

b. Since we assume constant Sales Price and Expense Inflation each year, it will be difficult to incorporate scenarios such as a downturn followed by a recovery, or strong growth followed by a downturn.

c. We should allow the Construction Loan Interest Rate to vary because rates tend to decrease in recessions, as central banks try to spur the economy with lower rates.

d. The Sales Velocity assumptions do not make sense because it is impossible to sell 0.5 Condo Units in a month; only integers should be allowed.

e. The Downside Case assumptions do not make sense because Expenses should not increase more rapidly than Condo Selling Prices.

2. You are now reviewing the assumptions for the Condo Unit Sales in Phase I, Phase II, and Phase III. The Phase II "Monthly Units Sold" formula is shown below:

	A	B	C	D	K	L	M	N	O
35									
36			**Construction Timeline:**	***Units:***	**Jun 18**	**Jul 18**	**Aug 18**	**Sep 18**	**Oct 18**
37									
38			Absolute Year #:	#	1	1	1	1	1
39			Absolute Month #:	#	6	7	8	9	10
40			% of Total Building Units Sold:	%	18.2%	21.2%	27.3%	33.3%	39.4%
41			Total Monthly Units Sold:	#	1.0	1.0	2.0	2.0	2.0
42									
43			Sales Price Inflation:	%	0.21%	0.21%	0.21%	0.21%	0.21%
44			Sales Inflation Multiplier:	#	1.01	1.01	1.02	1.02	1.02
45									
46			Expense Inflation:	%	0.21%	0.21%	0.21%	0.21%	0.21%
47			Expense Inflation Multiplier:	#	1.01	1.01	1.02	1.02	1.02
48									
49			% of Soft Costs Incurred:	%	1.0%	8.0%	4.0%	2.0%	3.0%
50									
51			**Phase I:**						
52			Monthly Units Sold:	#	1.0	1.0	1.0	1.0	1.0
53			Cumulative Units Sold:	#	6.0	7.0	8.0	9.0	10.0
54			Cumulative Percentage Sold:	%	60.0%	70.0%	80.0%	90.0%	100.0%
55			Total Value of Condo Units Sold:	*R$*	R$ 16,016,529	R$ 16,049,521	R$ 16,082,580	R$ 16,115,708	R$ 16,148,903
56									
57			Status (1 = Pre, 2 = Constr, 3 = Post-Constr):	#	2	2	2	2	2
58									
59			**Phase II:**						
60			Monthly Units Sold:	#	=IF(M$39<Ph2_Start_Month,"",MIN(Unit_Sales_per_Month,Phase_2_Units-L61))				
61			Cumulative Units Sold:	#			1.0	2.0	3.0
62			Cumulative Percentage Sold:	%			9.1%	18.2%	27.3%
63			Total Value of Condo Units Sold:	*R$*			R$ 16,424,157	R$ 16,457,988	R$ 16,491,889
64									
65			Status (1 = Pre, 2 = Constr, 3 = Post-Constr):	#			1	1	1

What is the PROBLEM with this formula?

a. There is no problem – it's correct because it displays a blank if Phase II has not yet begun; if it has begun, it displays the Unit Sales per Month until all the Phase II units have been sold.

b. It does not check for the case where the absolute month # (M39 here) might be blank text or not a number.

c. It does not check for the case where the previous month's Cumulative Units Sold (L61) here might be blank text or not a number.

d. It assumes that the Unit Sales per Month are the same in each phase, but they may vary over time.

e. It assumes the total Units to be sold in Phase II are fixed, but they might change depending on the scenario or completion date of Phase I.

3. You are now reviewing the Debt and Equity Schedule in this same model. Based on the descriptions above and the highlighted areas of the screenshot below, which of the following conditions must be true for an Equity Draw to take place?

Gross Income:	*R$*		**(8,963,439)**	**2,788,820**	**2,042,922**	**(4,941,119)**	**(5,706,039)**	**(12,965,246)**
(-) Cash Interest Expense:	*R$*		-	-	-	-	-	-
Cash Flow After Interest, Before Draws:	*R$*		**-R$ 8,963,439**	**R$ 2,788,820**	**R$ 2,042,922**	**-R$ 4,941,119**	**-R$ 5,706,039**	**-R$ 12,965,246**
Debt & Equity Schedules:	***Units:***		**Jan 18**	**Feb 18**	**Mar 18**	**Apr 18**	**May 18**	**Jun 18**
Monthly Interest Rate on Construction Loan:	%		0.80%	0.80%	0.80%	0.80%	0.80%	0.80%
Interest on Construction Loan:	*R$*		R$ -	R$ -	R$ -	R$ -	R$ -	R$ -
Cash Interest on Construction Loan:	*R$*		-	-	-	-	-	-
Interest Accrued to Loan Principal:	*R$*		-	-	-	-	-	-
Equity & Debt Draws:								
(+) Developer Equity:	*R$*		1,792,688	-	-	988,224	1,141,208	2,593,049
(+) Investor Equity:	*R$*		7,170,752	-	-	3,952,896	4,564,832	10,372,197
(+) Construction Loan:	*R$*		-	-	-	-	-	-
Total Equity & Debt Draws:	*R$*		**8,963,439**	**-**	**-**	**4,941,119**	**5,706,039**	**12,965,246**
Cash Generated After Equity & Debt Draws:	*R$*		**-**	**2,788,820**	**2,042,922**	**-**	**-**	**-**
Equity & Debt Balances:								
(+) Developer Equity:	*R$*		1,792,688	1,792,688	1,792,688	2,780,912	3,922,120	6,515,169
(+) Investor Equity:	*R$*		7,170,752	7,170,752	7,170,752	11,123,647	15,688,479	26,060,676
(+) Construction Loan:	*R$*		-	-	-	-	-	-
Total Equity & Debt Balances:	*R$*		**8,963,439**	**8,963,439**	**8,963,439**	**13,904,559**	**19,610,598**	**32,575,845**
Construction Loan Repayments:	*R$*		**-**	**-**	**-**	**-**	**-**	**-**
Cash Flow After Draws & Debt Repayment:	*R$*		**R$ -**	**R$ 2,788,820**	**R$ 2,042,922**	**R$ -**	**R$ -**	**R$ -**

a. Gross Income must be negative, and the % of Total Units Sold must be less than 50%.

b. Cash Flow After Interest, Before Draws must be negative, and the % of Total Units Sold must be less than 50%.

c. If it's the last month of the project (the "post-construction phase end"), there must be an outstanding Construction Loan balance that has not yet been paid off.

d. If it's the last month of the model timeline, there must be an outstanding Construction Loan balance that has not yet been paid off.

e. Condition A or C.

f. Condition A or D.

g. Condition B or C.

h. Condition B or D.

4. **The Waterfall Returns Schedule in this model has a Preferred Return of 1.0x Invested Equity for the Investors, followed by a 1.0x Catch-Up Return for the Developers, followed by an 80% / 20% split between a 1.0x Total Equity Multiple and a 20% IRR, 70% / 30% between a 20% IRR and 2.0x Total Equity Multiple, and 60% / 40% above a 3.0x Multiple.**

   In the screenshot below, what is the correct LOGIC for the "Tier 2 Accrual Distribution" formula?

Cash Flow Avail. for Tier 1 Distributions:	*R$*		-	-	-	-	-	-
Tier 1 - 1.0x Multiple Up to 20.0% IRR:								
(+) Beginning Balance:	*R$*		-	8,963,439	6,311,845	4,365,553	9,373,507	15,223,050
(+) Investor Injections:	*R$*		8,963,439	-	-	4,941,119	5,706,039	12,965,246
(+) Investor Accruals:	*R$*	20.0%	-	137,226	96,631	66,834	143,503	233,057
(-) Preferred and Catch-Up Distributions:	*R$*		-	(2,788,820)	(2,042,922)	-	-	-
(-) Tier 1 Accrual Distribution:	*R$*		-	-	-	-	-	-
Ending Balance:	*R$*		**8,963,439**	**6,311,845**	**4,365,553**	**9,373,507**	**15,223,050**	**28,421,353**
Investor Cash Flow:	*R$*	80.0%	-	-	-	-	-	-
Developer Cash Flow:	*R$*	20.0%	-	-	-	-	-	-
Cash Flow Avail. for Tier 2 Distributions:	*R$*		-	-	-	-	-	-
Tier 2 - 20.0% IRR to 3.0x Multiple:								
(+) Beginning Balance:	*R$*		-	26,890,318	24,101,498	22,058,575	36,881,934	54,000,052
(+) Investor Injections:	*R$*		8,963,439	-	-	4,941,119	5,706,039	12,965,246
(+) Investor Accruals:	*R$*	3.00 x	17,926,879	-	-	9,882,239	11,412,079	25,930,492
(-) Preferred and Catch-Up Distributions:	*R$*		-	(2,788,820)	(2,042,922)	-	-	-
(-) Tier 1 Accrual Distribution:	*R$*		-	-	-	-	-	-
(-) Tier 2 Accrual Distribution:	*R$*		-	-	-	-	-	-
Ending Balance:	*R$*		**26,890,318**	**24,101,498**	**22,058,575**	**36,881,934**	**54,000,052**	**92,895,791**
Investor Cash Flow:	*R$*	70.0%	-	-	-	-	-	-
Developer Cash Flow:	*R$*	30.0%	-	-	-	-	-	-
Cash Flow Avail. for Tier 3 Distributions:	*R$*		-	-	-	-	-	-
Tier 3 - Above 3.0x Multiple:								
Investor Cash Flow:	*R$*	60.0%	-	-	-	-	-	-
Developer Cash Flow:	*R$*	40.0%	-	-	-	-	-	-
Remaining Cash to Distribute:	*R$*		**R$** -	**R$** -	**R$** -	**R$** -	**R$** -	**R$** -

a. Compare the (Beginning Balance + Investor Injections + Investor Accruals, minus Preferred, Catch-Up, and Tier 1 Distributions) to the Cash Flow Available for Tier 2 Distribution, and take the lesser of those two numbers; ensure that this can only be negative or 0.

b. Compare the (Beginning Balance + Investor Injections + Investor Accruals) to the Cash Flow Available for Tier 2 Distribution, and take the lesser of those two numbers; ensure that this can only be negative or 0.

c. Compare the (Beginning Balance + Investor Injections + Investor Accruals, minus Preferred, Catch-Up, and Tier 1 Distributions) to the Total Cash Flow to Equity Investors, and take the lesser of those two numbers; ensure that this can only be negative or 0.

d. Compare the (Beginning Balance + Investor Accruals) to the Cash Flow Available for Tier 2 Distribution, and take the lesser of those two numbers; ensure that this can only be negative or 0.

5. The sensitivity tables for the Investors are shown below (we are not showing the Developer tables here because the returns patterns do not differ significantly):

Sensitivity Analyses:

Investors - Equity IRR and Scenario vs. Sales Velocity:

Scenario:	Sales Velocity per Month:										
	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
Downside	**10.2%**	12.1%	13.2%	15.5%	17.9%	19.7%	21.5%	25.3%	28.4%	29.4%	38.4%
Base	12.1%	14.0%	14.9%	17.1%	19.5%	**21.2%**	22.9%	26.6%	29.8%	30.8%	40.0%
Upside	14.1%	15.8%	16.6%	18.6%	21.0%	22.6%	24.3%	28.0%	31.2%	32.2%	**41.7%**

Investors - Equity IRR and Scenario vs. Months in Construction Period:

Scenario:	Months in Construction Period:										
	20	21	22	23	24	25	26	27	28	29	30
Downside	11.7%	11.3%	10.9%	10.5%	**10.2%**	9.9%	9.6%	9.4%	9.1%	8.9%	8.6%
Base	22.8%	22.4%	22.0%	21.6%	**21.2%**	20.7%	20.3%	19.9%	19.4%	18.9%	18.4%
Upside	42.4%	42.3%	42.0%	41.9%	**41.7%**	42.4%	43.3%	44.4%	45.8%	47.6%	49.8%

Investors - Equity IRR and Scenario vs. Condo Selling Price per Square Meter:

Scenario:	Condo Selling Price per Square Meter:										
	R$ 22,000	R$ 23,000	R$ 24,000	R$ 25,000	R$ 26,000	R$ 27,000	**R$ 28,000**	R$ 29,000	R$ 30,000	R$ 31,000	R$ 32,000
Downside	0.0%	(3.0%)	0.0%	0.0%	3.3%	6.8%	**10.2%**	13.5%	16.8%	20.1%	23.2%
Base	0.0%	0.0%	(3.9%)	(0.0%)	6.8%	14.3%	**21.2%**	27.1%	32.9%	38.6%	44.0%
Upside	0.0%	0.0%	0.0%	(1.5%)	10.4%	27.0%	**41.7%**	57.9%	74.2%	92.8%	115.6%

Investors - Equity IRR and Scenario vs. Condo Selling Price per Square Meter:

Scenario:	Hard Costs per Gross Square Meter:										
	R$ 10,000	R$ 11,000	R$ 12,000	R$ 13,000	R$ 14,000	**R$ 15,000**	R$ 16,000	R$ 17,000	R$ 18,000	R$ 19,000	R$ 20,000
Downside	37.0%	30.9%	25.4%	20.3%	15.1%	**10.2%**	5.5%	0.8%	0.0%	(3.1%)	0.0%
Base	76.3%	58.8%	47.1%	38.6%	29.7%	**21.2%**	11.6%	1.6%	(2.3%)	0.0%	0.0%
Upside	296.9%	210.7%	140.9%	94.3%	64.8%	**41.7%**	21.7%	0.0%	0.0%	0.0%	0.0%

Based on these tables and the questions, descriptions, and assumptions above, what is the MAIN risk factor in this deal?

a. The Sales Velocity per Month will be lower than expected.

b. The construction may be delayed or take longer than expected to finish.

c. The Condo Selling Price per Square Meter will suddenly fall once development begins.

d. The Hard Costs per Gross Square Meter will suddenly rise once development begins.

e. The Condo Selling Price per Square Meter will keep declining over time instead of staying the same or increasing, due to an ongoing downturn.