Chapter 27

HOW TO CONSTRUCT YOUR OWN RETIREMENT SCENARIOS MODELING SYSTEM

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CONSTRUCTION OF RETIREMENT SCENARIO MODEL

Retire Year	Year	Age	Spouse Age	Child 1 Age	Opening Asset Balance	Inflation Rate	Annual Expenses	Asset After Withdrawal	Asset Gain/(Loss)	Asset Expensed	Asset Balance	Average Return Rate	Return Sum	Return Sum Reinvested	Additional Asset	Income	Closing Balance
1	2017	45	40			3.00%		0,000			0,000	5.00%	0,000				0,000
2	2018	46	41		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
3	2019	47	42		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
4	2020	48	43		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
5	2021	49	44		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
6	2022	50	45		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
7	2023	51	46		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
8	2024	52	47		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
9	2025	53	48		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
10	2026	54	49		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
11	2027	55	50		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
12	2028	56	51		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
13	2029	57	52		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
14	2030	58	53		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
15	2031	59	54		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
16	2032	60	55		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
17	2033	61	56		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
18	2034	62	57		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
19	2035	63	58		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
20	2036	64	59		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
21	2037	65	60		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
22	2038	66	61		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
23	2039	67	62		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
24	2040	68	63		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
25	2041	69	64		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
26	2042	70	65		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
27	2043	71	66		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
28	2044	72	67		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
29	2045	73	68		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
30	2046	74	69		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
31	2047	75	70		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
32	2048	76	71		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
33	2049	77	72		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
34	2050	78	73		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
35	2051	79	74		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
36	2052	80	75		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
37	2053	81	76		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
38	2054	82	77		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
39	2055	83	78		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
40	2056	84	79		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
41	2057	85	80		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
42	2058	86	81		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
43	2059	87	82		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
44	2060	88	83		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
45	2061	89	84		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
46	2062	90	85		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
47	2063	91	86		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
48	2064	92	87		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
49	2065	93	88		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
50	2066	94	89		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
51	2067	95	90		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
52	2068	96	91		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
53	2069	97	92		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
54	2070	98	93		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000
55	2071	99	94		0,000	3.00%		0,000			0,000	5.00%	0,000				0,000

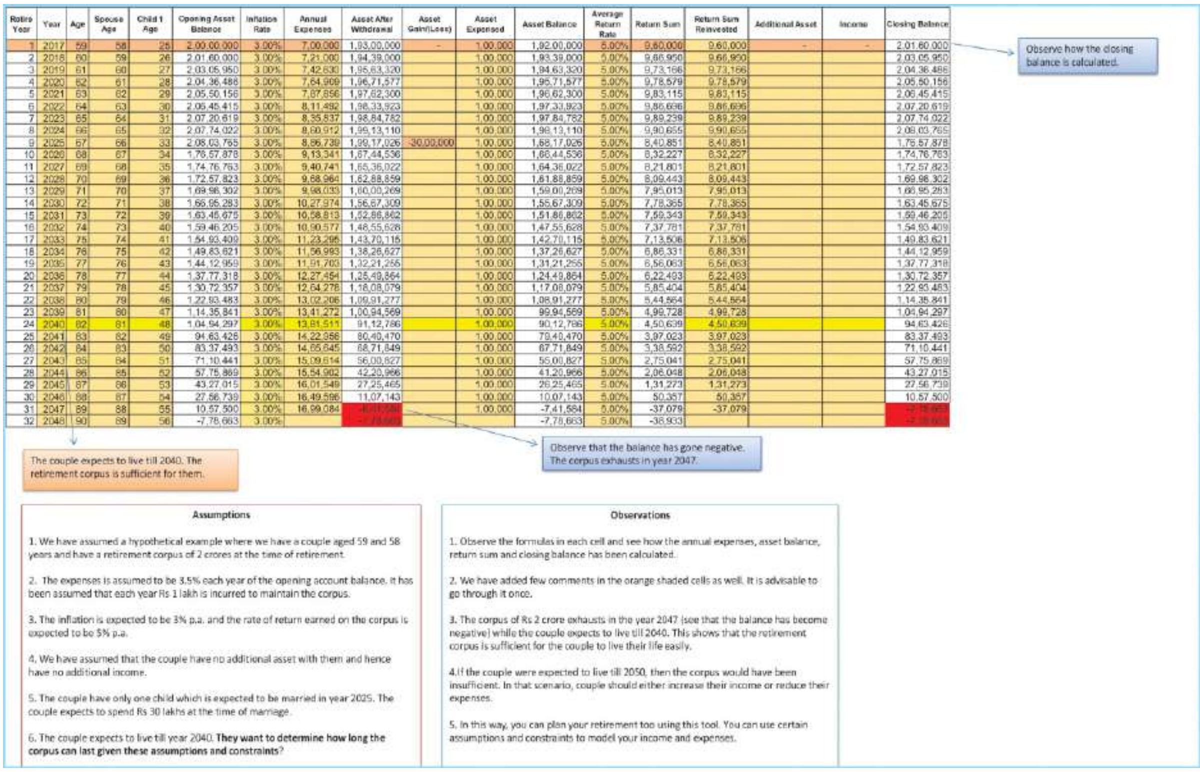
Retirement scenario modeling can be used to plan your retirement effectively. It helps you to estimate how your retirement roadmap would look lke if certain events happen at certain age. You can use this tool to make certain assumptions about your retirement such as your age, spouse 's age , income, expenses etc.

You can use the above retirement planning tool to model your income and expenses. In the next sheet, we would be discussing a hypothetical example which would help you to understand this tool in a better way.

This is the retirement scenario modeling sheet that you can use to estimate how your retirement roadmap would look like if certain events happen at certain years that you can proactively adjust from this sheet itself. This is an instruction on how to use it. Now, this is the first year when you do retire from what you are normally working on. You put in the year everything is in peach color these are the column that you should fill in and everything that is in white are columns you can ignore. You have a year, your age and age of your spouse, you have children put their age in, so you can see that when they go to university what are the years, their age and what are the years when they need to incur significant expenses. In the first column, this is our retirement year or the years that can be used to fund your retirement asset. For example, property sold, whatever your investments or bank account.

In the second column, you don't need to fill it because it's linked to this, whatever it was a closing balance which will go to in a short while. The closing balance will be linked to that year when we carry forward to the following year. This is why this number you don't need to change it. You can put the inflation rate flexibly. You can put in 2 or 3 or 4 percent, it is up to you. So the next column is annual expenses. If you have the post-retirement money expenses that you think you need you can put that in here. If you need it to be inflated then you can just use some formula to get plus 3 percent effect to every year and these expenses will be inflated. There will be one time changes along the way that will deplete or increase your annual expenses. So you can make some manual formula over here. This is quite an asset withdrawal which means that this essentially is what you have an opening asset for that year here and it's deducting the annual expenses that you need and this will be the balance. So assuming that at the start of any retirement year you have allocated your annual expenses upfront although that might not be the case. But this is the way where we can project everything in a very systematic manner. And this is the column that is meant to put in investment asset gain or loss. You might have gained a certain maybe a windfall thing like that. So these are the column that you can utilize to say what are the other asset that is one time be added into your total asset of that year. That could be used to fund your retirement. And as the expense is things like you need to pay cash to buy for a car or in the U.S. where you need to spend for your children's education or a lump sum that you can spend for the vacation. This is the expense known as your dream money or gift money. Instead of putting it here because this is where you should only put your survival money and what is the recurring things like your food your health medical things like that that you expect your medical premium, your recurring maintenance, and whatnot so this will be a normal expense but expenses recurring one time and in the big amount actually education going for a vacation, put it here so that it's more visible for the balance.

Here is an equation whereby asset after withdrawal, you plus or minus this column and also of minus one is the asset being an expense and you have an asset balance over here. And thereafter this asset balance you assume that you are investing it in a portfolio maybe just a very concentrated putting in cash deposit a few 2 percents to 3 percent or it could be a mix of a few assets. So these are the average return rate. This is where we go as average return of everything some assets are higher returns some assets are lower returns. But you put in some indicative figure of return, going forward 5 percent per annum is a very conservative and very doable, very viable. This will be quite a return sum formula whereby, it is a percentage of return over your asset balance, your total investable asset for your retirement. Some investor reflects whatever return that you generated from, this thing with time and they are being practical not everything being invested. If you put something in your bank account and it generates almost zero percent of interest or return then this is something that will be omitted from this column. So this column was only concerned about what is the asset that is being reinvested.



Retire Year	Year	Age	Spouse Age	Child 1 Age	Opening Asset Balance	Inflation Rate	Annual Expenses	Asset After Withdrawal	Asset Gain/(Loss)	Asset Expensed	Asset Balance	Average Return Rate	Return Sum	Return Sum Reinvested	Additional Asset	Income	Closing Balance
1	2017	59	58	25	2,00,00,000	3.00%	7,00,000	1,93,00,000	-	1,00,000	1,92,00,000	5.00%	9,60,000	9,60,000	-	-	2,01,60,000
2	2018	60	59	26	2,01,60,000	3.00%	7,21,000	1,94,39,000		1,00,000	1,93,39,000	5.00%	9,66,950	9,66,950			2,03,05,950
3	2019	61	60	27	2,03,05,950	3.00%	7,42,630	1,95,63,320		1,00,000	1,94,63,320	5.00%	9,73,166	9,73,166			2,04,36,486
4	2020	62	61	28	2,04,36,486	3.00%	7,64,909	1,96,71,577		1,00,000	1,95,71,577	5.00%	9,78,579	9,78,579			2,05,50,156
5	2021	63	62	29	2,05,50,156	3.00%	7,87,856	1,97,62,300		1,00,000	1,96,62,300	5.00%	9,83,115	9,83,115			2,06,45,415
6	2022	64	63	30	2,06,45,415	3.00%	8,11,492	1,98,33,923		1,00,000	1,97,33,923	5.00%	9,86,696	9,86,696			2,07,20,619
7	2023	65	64	31	2,07,20,619	3.00%	8,35,837	1,98,84,782		1,00,000	1,97,84,782	5.00%	9,89,239	9,89,239			2,07,74,022
8	2024	66	65	32	2,07,74,022	3.00%	8,60,912	1,99,13,110		1,00,000	1,98,13,110	5.00%	9,90,655	9,90,655			2,08,03,765
9	2025	67	66	33	2,08,03,765	3.00%	8,86,739	1,99,17,026	-30,00,000	1,00,000	1,68,17,026	5.00%	8,40,851	8,40,851			1,76,57,878
10	2026	68	67	34	1,76,57,878	3.00%	9,13,341	1,67,44,536		1,00,000	1,66,44,536	5.00%	8,32,227	8,32,227			1,74,76,763
11	2027	69	68	35	1,74,76,763	3.00%	9,40,741	1,65,36,022		1,00,000	1,64,36,022	5.00%	8,21,801	8,21,801			1,72,57,823
12	2028	70	69	36	1,72,57,823	3.00%	9,68,964	1,62,88,859		1,00,000	1,61,88,859	5.00%	8,09,443	8,09,443			1,69,98,302
13	2029	71	70	37	1,69,98,302	3.00%	9,98,033	1,60,00,269		1,00,000	1,59,00,269	5.00%	7,95,013	7,95,013			1,66,95,283
14	2030	72	71	38	1,66,95,283	3.00%	10,27,974	1,56,67,309		1,00,000	1,55,67,309	5.00%	7,78,365	7,78,365			1,63,45,675
15	2031	73	72	39	1,63,45,675	3.00%	10,58,813	1,52,86,862		1,00,000	1,51,86,862	5.00%	7,59,343	7,59,343			1,59,46,205
16	2032	74	73	40	1,59,46,205	3.00%	10,90,577	1,48,55,628		1,00,000	1,47,55,628	5.00%	7,37,781	7,37,781			1,54,93,409
17	2033	75	74	41	1,54,93,409	3.00%	11,23,295	1,43,70,115		1,00,000	1,42,70,115	5.00%	7,13,506	7,13,506			1,49,83,621
18	2034	76	75	42	1,49,83,621	3.00%	11,56,993	1,38,26,627		1,00,000	1,37,26,627	5.00%	6,86,331	6,86,331			1,44,12,959
19	2035	77	76	43	1,44,12,959	3.00%	11,91,703	1,32,21,255		1,00,000	1,31,21,255	5.00%	6,56,063	6,56,063			1,37,77,318
20	2036	78	77	44	1,37,77,318	3.00%	12,27,454	1,25,49,864		1,00,000	1,24,49,864	5.00%	6,22,493	6,22,493			1,30,72,357
21	2037	79	78	45	1,30,72,357	3.00%	12,64,278	1,18,08,079		1,00,000	1,17,08,079	5.00%	5,85,404	5,85,404			1,22,93,483
22	2038	80	79	46	1,22,93,483	3.00%	13,02,206	1,09,91,277		1,00,000	1,08,91,277	5.00%	5,44,564	5,44,564			1,14,35,841
23	2039	81	80	47	1,14,35,841	3.00%	13,41,272	1,00,94,569		1,00,000	99,94,569	5.00%	4,99,728	4,99,728			1,04,94,297
24	2040	82	81	48	1,04,94,297	3.00%	13,81,511	91,12,786		1,00,000	90,12,786	5.00%	4,50,639	4,50,639			94,63,426
25	2041	83	82	49	94,63,426	3.00%	14,22,956	80,40,470		1,00,000	79,40,470	5.00%	3,97,023	3,97,023			83,37,493
26	2042	84	83	50	83,37,493	3.00%	14,65,645	68,71,849		1,00,000	67,71,849	5.00%	3,38,592	3,38,592			71,10,441
27	2043	85	84	51	71,10,441	3.00%	15,09,614	56,00,827		1,00,000	55,00,827	5.00%	2,75,041	2,75,041			57,75,869
28	2044	86	85	52	57,75,869	3.00%	15,54,902	42,20,966		1,00,000	41,20,966	5.00%	2,06,048	2,06,048			43,27,015
29	2045	87	86	53	43,27,015	3.00%	16,01,549	27,25,465		1,00,000	26,25,465	5.00%	1,31,273	1,31,273			27,56,739
30	2046	88	87	54	27,56,739	3.00%	16,49,596	11,07,143		1,00,000	10,07,143	5.00%	50,357	50,357			10,57,500
31	2047	89	88	55	10,57,500	3.00%	16,99,084	[illegible]		1,00,000	-7,41,584	5.00%	-37,079	-37,079			[illegible]
32	2048	90	89	56	-7,78,663	3.00%		[illegible]			-7,78,663	5.00%	-38,933				[illegible]

Observe how the closing balance is calculated.

The couple expects to live till 2040. The retirement corpus is sufficient for them.

Observe that the balance has gone negative. The corpus exhausts in year 2047.

Assumptions

1. We have assumed a hypothetical example where we have a couple aged 59 and 58 years and have a retirement corpus of 2 crores at the time of retirement.

2. The expenses is assumed to be 3.5% each year of the opening account balance. It has been assumed that each year Rs 1 lakh is incurred to maintain the corpus.

3. The inflation is expected to be 3% p.a. and the rate of return earned on the corpus is expected to be 5% p.a.

4. We have assumed that the couple have no additional asset with them and hence have no additional income.

5. The couple have only one child which is expected to be married in year 2025. The couple expects to spend Rs 30 lakhs at the time of marriage.

6. The couple expects to live till year 2040. **They want to determine how long the corpus can last given these assumptions and constraints?**

Observations

1. Observe the formulas in each cell and see how the annual expenses, asset balance, return sum and closing balance has been calculated.

2. We have added few comments in the orange shaded cells as well. It is advisable to go through it once.

3. The corpus of Rs 2 crore exhausts in the year 2047 (see that the balance has become negative) while the couple expects to live till 2040. This shows that the retirement corpus is sufficient for the couple to live their life easily.

4. If the couple were expected to live till 2050, then the corpus would have been insufficient. In that scenario, couple should either increase their income or reduce their expenses.

5. In this way, you can plan your retirement too using this tool. You can use certain assumptions and constraints to model your income and expenses.

Moving on you have additional asset addition like for example properties that are not sold yet but that investment property used to fund your retirement and you don't want to sell it at the point of retirement, you want to keep it until the point where for whatever reasons let's say you want to sell it in 2023. So this is the column where you want to put in the amount that you expect the valuation of the asset would be. I would say this column is for an additional asset when you can put in any windfall inheritance. So any kind of income like mentioned in retirement. We not only want to sit around and watch the grass grow. There will be some passive income there will be some rental income, there will be a part-time job, consulting and whatnot that's been generated and this is where you want to put in any kind of income over here so you have very good visibility of how this whole thing works. This whole thing displayed what is the allocation that comes from my income, additional income, or the allocation that comes from a windfall inheritance or selling a property. In the end, your closing balance for the year is a result of an equation whereby you sum all this together, you sum your asset balance, and your return sum reinvested your additional asset and any kind of income. Some of these together and you will be being carried forward to the following year and you will have a timeline whereby this table will automatically especially the closing balance automatically turns into a red if at any years your retirement assets get debited.