

# Module 04 – Multiperiod Modeling

## Exploratory Data Analysis

*In this section, you should perform some data analysis on the data provided to you. Please format your findings in a visually pleasing way and please be sure to include these cuts:*

- *Make a nicely formatted table with the needed data on each investment*

Investment Name	Investment Pct	Month Can Start Investing	Years to Maturity	Investment	Inflow	Outflow	Investment	Inflow	Outflow
Lollipop Lane Investments	0.02	1	1	Lollipop Lane Investments	1	2	Lollipop Lane Investments	1	2
LuxeLollipop Asset Management	0.0422	1	2	Lollipop Lane Investments	2	3	LuxeLollipop Asset Management	1	3
Nougat Nest Investments	0.0647	2	3	Lollipop Lane Investments	3	4	TruffleTrust Holdings	1	6
SwizzleStick Strategies	0.087	3	4	Lollipop Lane Investments	4	5	Lollipop Lane Investments	2	3
TruffleTrust Holdings	0.1094	1	5	Lollipop Lane Investments	5	6	Nougat Nest Investments	2	5
				Lollipop Lane Investments	6	7	Lollipop Lane Investments	3	4
				Lollipop Lane Investments	7	8	LuxeLollipop Asset Management	3	5
				Lollipop Lane Investments	8	9	SwizzleStick Strategies	3	7
				Lollipop Lane Investments	9	10	Lollipop Lane Investments	4	5
				LuxeLollipop Asset Management	1	3	Lollipop Lane Investments	5	6
				LuxeLollipop Asset Management	3	5	LuxeLollipop Asset Management	5	7
				LuxeLollipop Asset Management	5	7	Nougat Nest Investments	5	8
				LuxeLollipop Asset Management	7	9	Lollipop Lane Investments	6	7
				Nougat Nest Investments	2	5	Lollipop Lane Investments	7	8
				Nougat Nest Investments	5	8	LuxeLollipop Asset Management	7	9
				SwizzleStick Strategies	3	7	Lollipop Lane Investments	8	9
				TruffleTrust Holdings	1	6	Lollipop Lane Investments	9	10

## Model Formulation

*Write the formulation of the model into here prior to implementing it in your Excel model. Be explicit with the definition of the decision variables, objective function, and constraints*

The decision variables represent the investment from each firm each year. The Objective function minimizes the Fisher and Murr Candy Shop's cost. The amount paid by the firm each year has to be greater than zero.

## Model Optimized for Least Cost out of Pocket

*Implement your formulation into Excel and be sure to make it neat. This section should include:*

- *A screenshot of your optimized final model (formatted nicely, of course)*
- *A text explanation of what your model is recommending*
- *Add some sort of visualization. Some ideas:*
  - o *A pie chart or stacked bar chart to compare money out of pocket vs end amount*
  - o *A line chart to show either current amount or cumulative amount invested in each investment*

Objective Function:

$$\text{MIN } A1+B1+C1$$

Subject to:

Cash Invested at the Beginning of the Month:

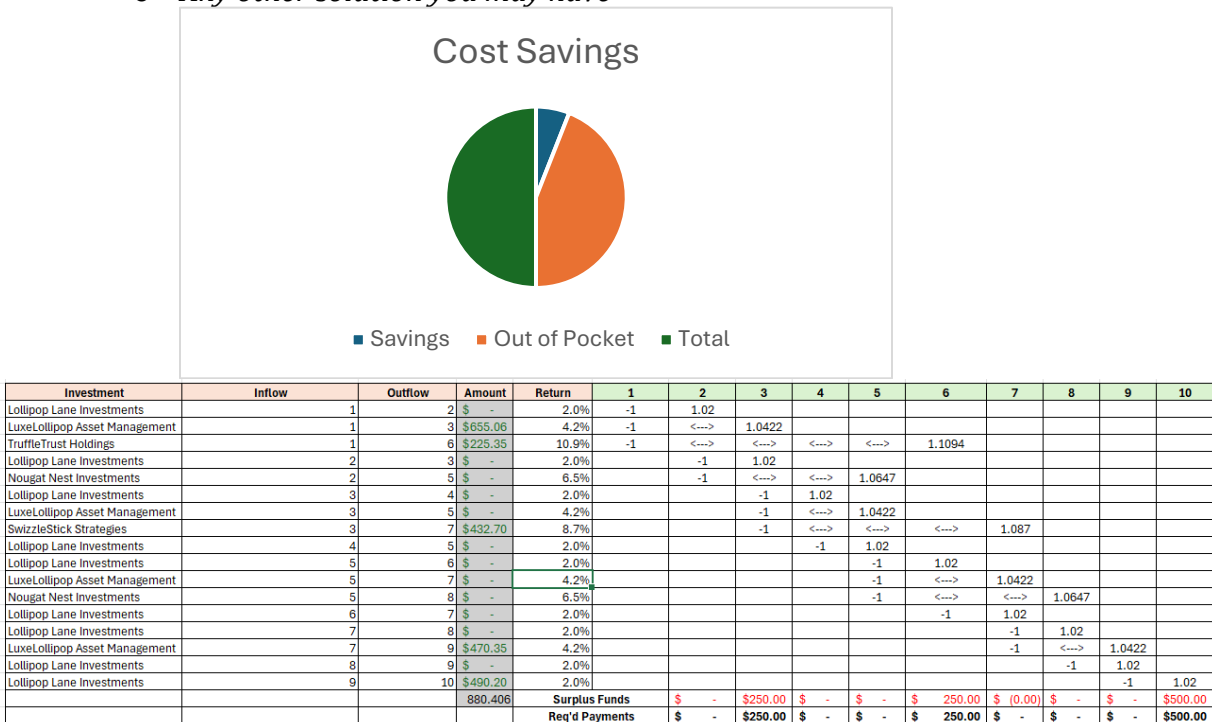
$$1.02a_2 - 1a_2 - 1b_2 = 0 \text{ Month 2}$$

$$1.0422b_1 + 1.02a_2 - 1c_2 - 1a_3 - 1b_3 = 250 \text{ Month 3}$$

$$1.02c_2 - 1c_3 = 0 \text{ Month 4}$$

$1.0647b_2 + 1.0422a_3 + 1.02c_3 - 1a_4 - 1b_4 - 1c_4 = 0$  Month 5  
 $1.1094a_1 + 1.02a_4 - 1a_5 = 250$  Month 6  
 $1.087b_3 + 1.0422b_4 + 1.02a_5 - 1c_5 = 0$  Month 7  
 $1.0647c_4 + 1.02b_5 - 1a_6 = 0$  Month 8  
 $1.0422c_5 + 1.02a_6 - 1b_6 = 0$  Month 9  
 $1.02b_6 = 500$  Month 10

- Any other solution you may have



## Model with Stipulation

Please copy the tab of your original model before continuing with the next part to avoid messing up your original solution.

Try one of these 2 scenarios:

- If we remove the midterm payments and instead pay the entirety at the end of the time period, does your model change at all? If so, why may there be a change?
- An investor normally tries to not be oversubscribed/overexposed to one single investment. Can you add a constraint to your model to limit the amount of exposure in any single investment and describe how the model has changed?

By Delaying payments until the end of the year, you would hold the money for a longer period of time which allows for you to potentially reinvest. If payments are compounded over time, the final amount will be larger.