Laurentian Bakeries | Capital investment appraisal

Project: Evaluate a proposed $5.2 million manufacturing-capacity expansion over a 10-year horizon.
My contribution: Independently developed the Excel capital-budgeting and quantitative analysis for a team MBA case assignment; other team members handled other deliverables.

$5.2M	10 YEARS	18%
INITIAL OUTLAY	MODEL HORIZON	CASE HURDLE RATE

What the model evaluates

Incremental revenue and cost savings; taxes and capital cost allowance (CCA); recurring capital expenditures; working-capital requirements; discount rates; and project risk.
Model outputs include three operating scenarios, NPV, IRR, sensitivity testing, Monte Carlo simulation, and tornado analysis.

Model conclusion

The expansion has a negative modeled NPV across all three selected scenarios at 18%.
The result is conditional on the assumptions and case information available.

Excel evidence | 10-year project cash flows

Actual rendering of the original spreadsheet; not a recreated illustration.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	**Project Cash Flow — Optimistic (100%)**													
2														
3		**Year 0**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**		
4	Incremental Units		2,200,000	4,000,000	5,300,000	5,300,000	5,300,000	5,300,000	5,300,000	5,300,000	5,300,000	5,300,000		
5	Selling Price per Pizza		$1.70	$1.70	$1.70	$1.70	$1.70	$1.70	$1.70	$1.70	$1.70	$1.70		
6	Incremental Revenue		$3,740,000	$6,800,000	$9,010,000	$9,010,000	$9,010,000	$9,010,000	$9,010,000	$9,010,000	$9,010,000	$9,010,000		
7														
8	Base Operating Income @ 15%		561,000	1,020,000	1,351,500	1,351,500	1,351,500	1,351,500	1,351,500	1,351,500	1,351,500	1,351,500		
9	Unit Cost Savings		174,230	283,100	307,800	307,800	307,800	307,800	307,800	307,800	307,800	307,800		
10	Other Annual Savings		138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000	138,000		
11	Operating Income before CCA (EBIT)		873,230	1,441,100	1,797,300	1,797,300	1,797,300	1,797,300	1,797,300	1,797,300	1,797,300	1,797,300		
12														
13	CCA		434,000	768,000	593,000	461,000	361,000	286,000	229,000	185,000	152,000	1,731,000		
14	Taxes		167,962	257,393	460,524	511,001	549,241	577,921	599,718	616,544	629,163	25,353		
15	After-Tax Operating Income / NOPAT		271,268	415,707	743,776	825,299	887,059	933,379	968,582	995,756	1,016,137	40,947		
16														
17	+ CCA		434,000	768,000	593,000	461,000	361,000	286,000	229,000	185,000	152,000	1,731,000		
18	- Ongoing CapEx		(520,000)	(520,000)	(520,000)	(520,000)	(520,000)	(520,000)	(520,000)	(520,000)	(520,000)	(520,000)		
19	- Change in NWC		(406,532)	(332,617)	(240,223)	0.00	0.00	0.00	0.00	0.00	0.00	979,372		
20	- Initial Project Cost	(5,200,000)												
21	**Free Cash Flow**	**(5,200,000)**	**(221,263)**	**331,090**	**576,552**	**766,299**	**728,059**	**699,379**	**677,582**	**660,756**	**648,137**	**2,231,318**		
22														
23	NPV @ 18%	**(2,865,310)**												
24	NPV @ WACC	**(1,616,145)**												
25	IRR	4.49%												
26														

The schedule bridges incremental operating income to free cash flow, incorporating CCA, ongoing capex, changes in net working capital, and the initial project outlay.

Excel evidence | Scenario analysis

Actual workbook outputs comparing alternative levels of sales and cost-savings realization.

Scenario Analysis

Assumption	Optimistic	Expected (75%)	Pessimistic 50%
U.S. Sales Volume	100%	75%	50%
Unit Cost Savings	100%	75%	50%
1996 Efficiency Ramp	70%	70%	70%

Metric	Optimistic	Expected (75%)	Pessimistic 50%
NPV @ 18%	($2,865,310)	($3,720,645)	($4,575,981)
NPV @ WACC	($1,616,145)	($2,876,717)	($4,137,289)
IRR	4.49%	-1.24%	-8.91%
Decision	Reject	Reject	Reject

Key Driver	Demand and cost savings do not overcome the $5.2M upfront investment and $520,000 annual ongoing CapEx.

All three modeled scenarios indicate a negative NPV at the case hurdle rate.
The 75% scenario is an illustrative operating case, not a probability-weighted expected value.

Excel evidence | Sensitivity and judgment

Actual spreadsheet renderings of the sensitivity and tornado worksheets.

SENSITIVITY ANALYSIS | Laurentian Bakeries

Assumption	Value / reference	Classification
Base NPV	(2,865,310)	Calculated
Sales realization	1	Variable
Cost savings realization	1	Variable
Pizza price	1.7	Contract review
Unit savings	0.019	Variable
Tax rate	0.3824	Fixed
Discount rate	0.18	Base fixed

COMBINED SENSITIVITY | Sales Volume + Cost Savings

Realization	Sales impact PV	Savings impact PV	Estimated NPV
50%	(1,595,188)	(386,724)	(4,847,222)
75%	(797,594)	(193,362)	(3,856,266)
100%	0	0	(2,865,310)
125%	797,594	193,362	(1,874,354)
150%	1,595,188	386,724	(883,397)

LAURENTIAN BAKERIES | TORNADO ANALYSIS

NPV Sensitivity (±5%)

MODEL INPUTS	Value
Base-case NPV	(2,865,310)
Sales NPV impact at +25%	797,594
Savings NPV impact at +25%	193,362
Shock to each driver	5%

MODEL NOTES
Base NPV linked to the original project model via Sensitivity Analysis.
Sales and savings impacts linked to Sensitivity Analysis; ±5% stress test.
Approximate NPV impact; excludes NWC changes

Driver	Low NPV (-5%)	High NPV (+5%)	Low vs Base	High vs Base	NPV swing
Sales volume realization	(3,024,829)	(2,705,791)	(159,519)	159,519	319,038
Cost savings realization	(2,903,982)	(2,826,637)	(38,672)	38,672	77,345

Driver	-5% NPV impact	+5% NPV impact
Sales volume realization	(159,519)	159,519
Cost savings realization	(38,672)	38,672

The original 50%, 75%, 100% case scenarios are not probabilities.

KEY OBSERVATION

Sales volume is the larger NPV driver in the selected tornado stresses. The Monte Carlo sheet is a learning simulation, not a calibrated risk forecast.

Notes: Original workbook by Osmane Sankara. Case materials not reproduced. Academic analysis, not investment advice.