

FROZEN FOOD PRODUCTS

Introduction

Maria D'souza planned to expand her business by introducing a new product line of frozen foods. Her firm was manufacturing tropical fruit pulp-purees and concentrates as per customer requirements. The firm had been founded by her father in the early 1980s as a privately owned company. The expansion plan was intended to double the business potential of her company. D'souza wanted to estimate the attractiveness of the new expansion by estimating Net Present Value (NPV) of the expected cash flows. As a first step to value the project, D'souza prepared projected earnings for the coming five years. She also prepared projected balance and estimated free cash flows. Although the growth rate over the five-year forecast period was high, she felt that the growth would stabilize at 5 percent per year after the initial high growth phase. Her main concern was to find a suitable discount rate to be applied to cash flows to ascertain the NPV of the project.

She called on one of her friends, who was a local financial consultant, and posed the problem to him:

"How can I estimate the cost of capital of our firm to evaluate the new expansion plan? Ours is a private firm and other than meeting our personal expenses, all profits are reinvested in the business. This was the reason for the steady growth of our business over the years. Can you find a way out to ascertain the cost of capital of our company?"

Her consultant friend asked her to analyze the cost of capital for similar companies operating in the same industry. The basic principle is that firms in the same industry have similar customers, operations, and assets; therefore, they bear similar risks and should have similar costs of capital. However, companies' total risk also includes risk due to financial leverage. If risk due to financial leverage can be isolated, the business risk of comparable companies should not vary too much. D'souza's consultant suggested examining the unlevered cost of equity for comparable companies operating in the food processing industry.

Operations of the Firm

The firm sourced fruits and vegetables from its orchards and nearby farms. The firm had always maintained strong and long-standing ties with the agricultural community in the nearby areas, which made it possible for an uninterrupted supply of fresh fruits and vegetables.

Fruit extracts had to be handled with extreme care before the thermal processing and stored at controlled temperatures. To add preservative value, the fruit juices were pasteurized by heating to nearly 100°C, followed by rapid cooling. The company used both canning processing and aseptic processing to add preservative value to fruit juice.

In the canning process, hot juice at 70°C to 80°C is poured into containers (cans or jars), and the containers are sealed and heated at 100°C to 105°C for up to 10 minutes and then cooled immediately. The heating and cooling should be done as fast as possible as slow heating and cooling would spoil the quality of the product.

In aseptic processing, the product is packaged in a container and heated between 91° to 146°C by a flash-heating process to achieve sterility. This method permits processed food to be stored for longer periods without the addition of preservatives. The products are packed in soft packages, typically a mix of paper (70 percent), polyethylene (LDPE) (24 percent), and aluminum (6 percent), with an inside layer of polyethylene film. This type of packaging forms a tight seal against microbiological organisms, contaminants, and degradation, eliminating the need for refrigeration. Another advantage of aseptic packs is its adaptability to different sized containers from single serving 200 ml pouches to bulk packs.

Expansion Plan

The demand for processed foods was growing in India, and there was a lot of potential for exports. However, the company could not realize its hidden potential as investment in capital expenses over the last few years was not adequate. D'souza felt new equipment needed to be installed on a priority basis and capital expenditures had to be continued to sustain the growth of the firm.

D'souza planned to introduce a new processing line for frozen foods using individual quick freezing (IQF) technology. In this freezing method, raw fruit and vegetables can be stored for more than a year by preserving the color, flavor, and texture of the products in farm-fresh conditions. This method of preservation enabled the availability of certain seasonal fruits and vegetables throughout the year.

Another advantage of the process is that the fruit and vegetable pieces are frozen individually using a fluidization technique that uses a blast of cold air directed on the food products to rapidly freeze them. Rapid freezing improves the texture of the food pieces and prevents lump formation to keep the product free flowing. The user of the frozen product need not thaw or defrost the whole package. As product pieces remain separate, the required quantity can be taken out from the packaging for immediate consumption, and the remaining portion can be kept frozen until required again.

Market for the Frozen Products

India was one of the world's largest food producers, and food production would continue to increase in the next decade. This created a large opportunity for investment in food and food processing technologies in the country.

The major market segments were retail outlets for direct consumption: hotels, restaurants, caterers, eateries, and other industries that use fruits and vegetables as raw material. Frozen fruits and vegetables also had an enormous demand in neighboring countries and offered

attractive export potential. Rapid growth of the fast-food industry in the sub-continent also enlarged business opportunities for frozen foods.

Financial Evaluations

The company was established in 1980 as a small private company and had steadily increased its operations. The frozen food plant was conceived as a wholly owned subsidiary of the parent firm; however, D'souza wanted to maintain separate accounts for the new project so that the performance of the new expansion could be monitored independently.

Exhibit 1: Projected Income Statement ('000)

Year	Revenue	Expenses	EBITDA	Interest Payments @ 8%	Depreciation @ 15%	Profit Before Tax	Tax @ 30%	Profit After Tax
1	4400	2400	2000	165	900	935	281	655
2	4900	2700	2200	175	945	1080	324	756
3	5400	3000	2400	185	983	1232	370	862
4	5900	3300	2600	194	1016	1390	417	973
5	6400	3600	2800	202	1043	1554	466	1088

Exhibit 2: Projected Balance Sheet ('000)

Year	Equity	Debt	Total Liabilities	Gross Fixed Assets	Less Accumulated Depreciation	Net Fixed Assets	Working Capital	Total Assets
0	6000	2000	8000	6000	0	6000	2000	8000
1	6375	2125	8500	7200	900	6300	2200	8500
2	6754	2251	9005	8400	1845	6555	2450	9005
3	7104	2368	9472	9600	2828	6772	2700	9472
4	7429	2476	9906	10800	3844	6956	2950	9906
5	7734	2578	10313	12000	4887	7113	3200	10313

To estimate the profitability of the new project, D'souza could easily estimate free cash flow to the firm for the next five years from the projected financial statements. Though the operations were expected to grow at a high rate during the next five years, D'souza felt that such high growth may not be sustainable in the long run and considered a perpetual growth rate of 5 percent per year in cash flows beyond the initial five years. The main problem was to find a suitable discounting rate for the company. As the company was not listed on any stock exchanges, the project beta and riskiness of cash flows could not be ascertained.

According to the consultant's suggestion, D'souza should evaluate the riskiness of a similar food processing company listed in the market and estimate the cost of capital of that company using publicly available information. As it was very difficult to identify a single company whose risk profile would exactly match the frozen food project, it was decided to review the cost of capital of all major food processing companies operating in the country. Since many frozen food companies were managed privately, the comparison was limited to companies listed on the stock exchanges. The following companies were classified under

the Food and Food Processing category in the S&P CNX 500 index, and D'souza decided to use the business risk of these companies as her reference point.

Exhibit 3: Particulars of Food and Food Processing Companies in S&P CNX 500 Index

Company	Year Ending	Face Value (Rs.)	Book Value (Rs.)	M Cap (Rs. million)	Net Income (Rs. million)	Equity (Rs. million)	Debt (Rs. million)	Equity Beta
Advanta India Ltd.	Dec-11	10	222.1	8,704.0	142.2	3,744.2	5,738.3	0.5472
Britannia Industries Ltd.	Mar-12	2	43.5	58,237.8	1678.7	5,200.4	281.5	0.2638
GlaxoSmithkline Consumer Healthcare Ltd.	Dec-11	10	272	121,160.1	3,552	11,441.8	0	0.0959
Jubilant Foodworks Ltd.	Mar-12	10	46	74,938.8	1073.4	2,995.5	0	0.9856
Kwality Dairy (India) Ltd.	Mar-12	1	8.9	6,116.3	909.9	910.5	4,248	0.6357
Rei Agro Ltd.	Mar-12	1	26.6	8,966.9	2,347.4	23,611.8	38,540.5	0.5393
Venky's (India) Ltd.	Mar-12	10	336.3	4,669.2	351.6	3,157.9	985.7	0.669
Zydus Wellness Ltd.	Mar-12	10	47.8	15,336.9	676.5	1,868.6	0	0.5372

The beta (β) of a stock measures the correlated volatility of an equity stock in relation to the volatility of the benchmark asset. A stock market index is generally used as a benchmark.

The formula for estimating the equity beta of a firm is:

$$\beta_{equity} = \frac{Cov(r_{equity}, r_{market\ index})}{Var(r_{market\ index})}$$

Where:

r_{equity} = the rate of return from the equity,

$r_{market\ index}$ = the rate of return of the market portfolio, and

$Cov(r_{equity}, r_{market\ index})$ = the covariance between the two rates of return.

Beta can also be estimated by regressing the return series of the stock against a stock market index. The equity betas of these companies were calculated using the daily stock prices of these companies and the value of a popular stock market index (BSE Sensex 30).

Historically, from 1998 until 2012, the 10-year India Government Bond yielded an average 8.0 percent return. The return varied from an all-time high of 12.3 percent in February 1999

to the low of 5.0 percent in October of 2003. The last reported benchmark interest rate was at 8.00 percent. In India, interest rate decisions are taken by the Reserve Bank of India's Central Board of Directors. The benchmark repurchase rate can be considered as the official interest rate. Considering these factors, D'souza decided to take the risk-free rate at 8 percent per year. This rate also closely matched the discounting rate of long maturity treasury bills.

Estimating the expected market premium was too confusing for Maria. She decided to use a recent survey report where the market risk premium of several countries was compiled. Fernandez et al. carried out a survey to measure the Market Risk Premium (MRP) used to calculate the required return to equity in different countries. As per the study, the market risk premium of India was 8 percent. The corresponding premium for Canada and the United States were 5.4 percent and 5.5 percent, respectively.

The Task Ahead

D'souza was confident these inputs were adequate to ascertain the cost of capital for her firm. To keep the analysis simple, she assumed a uniform tax rate of these companies at 30 percent. Further, the debts of these companies, including her company, were considered risk-free, and an identical cost of debt of 8 percent was taken for the valuation of the expansion plan.