APPLICATION OF BREAK-EVEN ANALYSIS FOR IDENTIFYING BREAK-EVEN POINT FOR A PROPOSED START-UP

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Abstract: This is a study of proposed start-up for knowing its break-even point. There are numerous start-ups that they begin with but fails ultimately. Out of total start-up efforts, percentage of successful start-ups are low. Indian start-up, face many problems. They are decision making, facing the criticisms, finding customers, time management, dealing with the unknown and self-doubt, hiring employees, team building & most importantly financial & cash flow management. The attempt is made here to know break-even point for a proposed business proposition made by start-up founders, who approached analysist for knowing the break-even point for their start-up.

Index Terms- Start-up, Innovation, Break-even quantity, Break-even sales, Fixed cost.

Introduction:

The break-even point is that point of activity (sales volume) where total revenues and total expenses are equal, it is the point of zero profit.

For any newly started or proposed business it is very essential to know at what point of time they are going to recover the investment or expenditure done in a business. That point of time we can get when a business will achieve specific number of sells in terms of quantity of produce or service or achieve sales revenue for a given price.

The term start-up is used to represent a young company, founded by one or more entrepreneurs. These are the firms or companies which are to produce or develop a unique product or service and to bring it to the market. With the information explosion, advent in science and technology, support from the varies organizations, startup kind of initiatives are getting fuel for their further development. There are government programmes to promote startups, incubation programmes, private companies' initiatives, programmes run by academia, angel investors and venture capitalist are the factors which are promoting young generation to innovate and venture into a new business with commercial business proposition.

Though there are great efforts by various institutions to promote start-up, Indian start-up, face many problems. They are decision making, facing the criticisms, finding customers, time management, dealing with the unknown and self-doubt, hiring employees, team building & most importantly financial & cash flow management.

If it is a boot-strapped start-up, then all the finances have to be borne by start-up founder/owners themselves. If they have to obtain funds from other financers especially from the angel funds or venture capitalist, they need to be very sound in their pitching so as to convince financers. A start-up proposal can become a good or convincing business proposal only when it gives clear picture on returns on capital invested. Break-even analysis is a good measure in this regard. It enables the analyst to take different price figures along with different quantity figures for the product/service that will be sold for specific period and thus estimate invested capitals recovery.

Founders of this start-up proposal (start-up under our case study discussion) are working on for pitching to get investment from their parents & near relatives. They want to present returns on their investments from this start-up. They have taken help from the academia to estimate these returns. The proposed investments, expenditures, sales revenue & the break-even analysis about the start-up under our case is discussed in this paper.

About Break-even Analysis:

A business start-up can use break-even analysis technique to know whether it would be financially viable to go with the new product/service as a new venture. This analysis is a useful & common tool used in developing a business plan. The formulas used to calculate break-even point are relatively simple but can be difficult to decide with projected sales, variable cost & for selecting the right sales price.

Usually the Break-even point is either the number of units that will be sold or sales in rupees required to cover the costs. It can be defined or stated in two ways. First is the point where an investment will start generating positive result, the second one is the point at which total costs is equal to total revenue.

The linear cost-volume-profit model acts as a basis for the formulas that are used to calculate break-even point.

The break-even equation & the terms used are as below.

{ Total fixed cost(TFC) + Total variable cost (TVC)] } = { [Selling price(P) * Number of units produced & sold (X)] }

TFC + TVC = P * X

TFC + (V*X) = P * X

Where TFC is total fixed cost. It is assumed that this TFC is constant for payback period & is not depend on the number of units produced. The fixed costs include salaries, real estate taxe rent, accounting fees, advertising, insurance etc.

TVC is the total variable cost which includes direct material & labour cost which goes into production & other expenditure which are directly proportional to the number of units produced & sold.

P is a sales price under linear model. One assumption made is sales price per unit remains constant.

X is the number of units sold in that period.

V is variable cost per unit.

TR is the total revenue obtained by multiplying P * X

Using this basic formula, we can calculate any one thing with other things given. e.g. we can calculate the sales in rupees (in monetary terms) required to break-even, for all other things constant. We can calculate the

price of the product to be kept so as to attain break-even and then the payback period (how long it will take us to break-even).

Among all these most commonly used are

Break-even units and Break-even sales,

Break-even Units (X)

X = TFC/(P-V)

Break-even sales

S = TFC/ (1-V/P)

(1-V/P) is also known as contribution margin ratio.

The above formulas are useful for companies producing only one kind of products. In reality we find companies that offer variety of products. It is possible to calculate break-even point of a company with more than one product. For that we should know sales percentage of each variety in the total sales mix. Then this information is used in calculating weighted average selling price & weighted average variable expenses.

For the companies offering multiple products with different price, formula used is as follows.

Beak-Even point = Total fixed expenses / (Weighted average selling price – weighted average Variable expenses)

Where,

Weighted average selling price = (sales price of product A * sales percentage of product A) + (sales price of product B * sales percentage of product B) + (sales price of product C * sales percentage of product C) + …….

Weighted average variable expenses = (variable expense of product A * sales percentage of product A) + (variable expense of product B * sales percentage of product B) + (variable expense of product C * sales percentage of product C) + ….

The Start-Up Case:

Cost factors for starting a paan shop includes Business, License, Name registration, Tax ID, Infrastructure cost like occupancy, Small counter, few shelves, big umbrella & small seating arrangements is also proposed by this start-up. Equipment's required includes few containers to keep snacks, foils etc. Refrigerator is a must.

The innovetors in this start-up have produced two types of paan which they claim not obtained elsewhere & named them as birbal paan & Champak paan. Along with these two innovated formulas they are planning to keep traditional as well as some trendy paans like mint paan & fire paan.

They planned to keep some accompaniments with their innovative produce & includes few candies, snacks, cookies & cram rolls. They think that these items are synonymous with paan shop. They decided not to keep cigarettes & tobacco products. Their uniqueness in service includes home delivery. Home

delivery of a kit which they have developed as one more innovative concept, this product will suffice the need of the family of 4 for three days. The area limit for home delivery is also fixed within 5 km. radius. The battery operated two wheeler is kept for that purpose.

For calculating break-even period one has to decide about price of the product and the variable cost. Now like other paan shops this start-up is also decided to offer variety of paans having different costings.

The total fixed cost/expenses for this start-up is Rs. 5,50,000/-. For the price decision, according to costing the founders have grouped their products in 5 categories. Let us use legend A,B,C,D,E to note these products . They are sadha-A, masala-B (includes many varieties having same costing), special paans-C, Birbal & champak (innovative variety)-D & paan kit- E.

One founder member has paan shop as their ancestral business. From his that experience and the primary survey that they have done for the proposed site chosen, their estimate is to sell 4000 items in the first month. . It will be in multiples of this number for first few months at least for first six months they guess. After that the growth will be reduced and by the year end it will be stable.

The start-up has decided to have round figure pricing for each variety & estimated around 40% profit on each. The price & cost figures would be as follows.

Table 1: Price and Cost Figures for proposed Start-up

	PRODUCTS				
	A	**B**	**C**	**D**	**E**
Sales price per unit	10	20	30	50	240
Variable expenses per unit	6	12	18	30	144

The start-up expects the sale of five products in following ratio.

Product A : 15%

Product B : 40%

Product C : 20%

Product D : 15%

Product E : 10%

The product D & E which are new & unique product of this start-up needed some efforts in terms of promotion. This expense in included in decided price, so as to retain 40% profit.

The weighted average selling price

= (10*15%)+(12*40%)+(18*20%)+(30*15%)+(240*10%)

= 1.5+8+6+7.5+24

= 47

The weighted average variable expenses

= (6*15%)+ (12*40%) + (18*20%) + (30*15%) + (144* 10%)

= 0.9 + 4.8 +3.6 + 4.5 + 14.4

= 28.2

Break-even point = Total fixed expenses / (Weighted average selling price – weighted average Variable expenses)

= 550000/47-28.2 = 550000/18.8 = 29,256

The start-up will have to sell 29,256 units to break-even.

It's possible to compute number of each variety to be sold for this break-even

Product A = 29256 * 15% = 4388

Product **B** = 29256 * 40% = 11703

Product C = 29256 * 20% = 5851

Product D = 29256 * 15% = 4388

Product E = 29256 * 10% = 2926

29256 units

Its possible to calculate sales revenue generated by each variety of paan and the total sales revenue generated by this break-even quantity sales. It is as below.

Sadha paan – A = 4388 * 10 = 43880/-

Masala paan –B = 11703 * 20 = 234060/-

Special paan –C = 5851 * 30 = 175530/-

Birbal paan – D = 4388 * 50 = 219400/-

Paan kit – E = 2926 * 240 = 702240/-

1375110 /-

Break-even sales = Rs. 13,75110/-

Break-Even Chart for this start-up can be prepared as below-

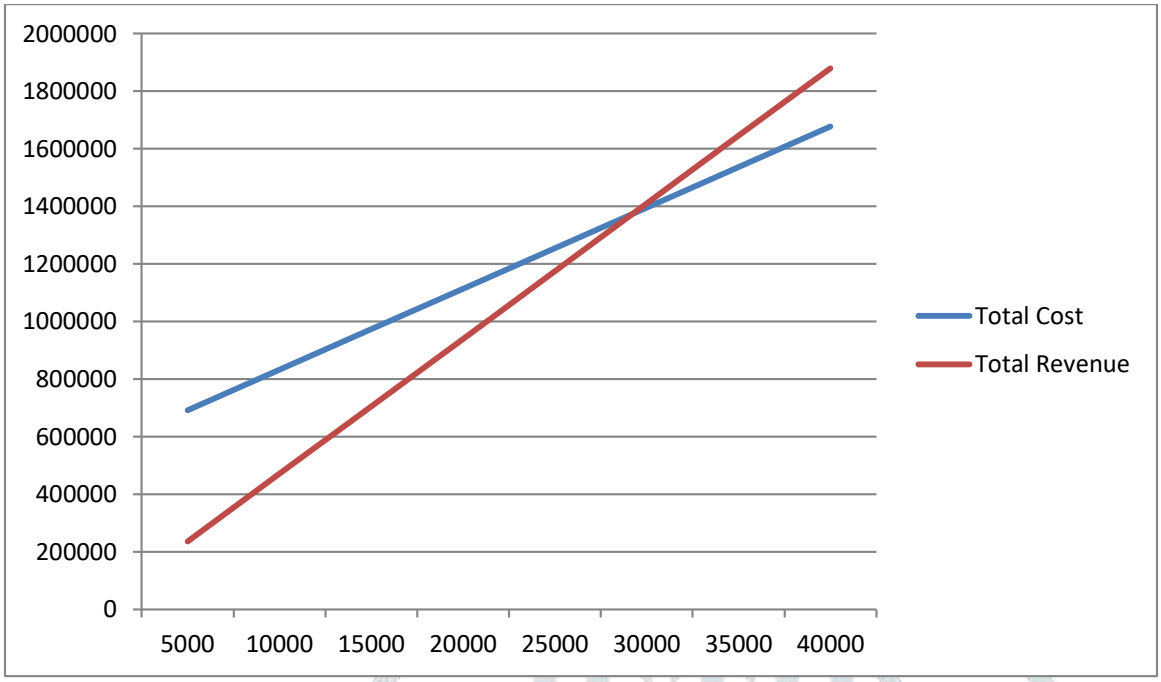

Chart 1: Break-even Chart

Results and Discussion:

As per the start-up preposition, the break even units are 29256 and break even sales is Rs.1375110/-. In reality when production increase happens , the expenditure considered as a fixed cost, tend to increase. This happens because some factors increase as business grows. Cost factors like insurance, rent, number of salaried employee change etc. tend to change after a year and that has a bearing on the fixed cost calculations. The analyst need to see this and should revisit the analysis with corrected cost figures, over a period. The break-even period also can be calculated as start-up founders have estimated sales figures which they can achieve per month for initial period after they start their operations. They have expressed that the sales will be 4000 items in the first month and then in multiples of it in next few successive month. With this estimate, to reach beak-even sales figure of 29256, this start-up will take 4 months period.

References:

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