

An Analysis of a Start-Up Craft Brewery

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Abstract

Developing an understanding and appreciation of the important role financial management plays in business is critical for all business students. However, concepts in this knowledge area are often perceived as difficult by undergraduate and graduate students alike. Business finance curriculum, therefore, particularly benefits from fostering active engagement with the material in a way that offers students an opportunity to experience real life scenarios. Simulations provide a fun and efficient manner to bring financial management concepts to life for students and have been shown to improve decision-making and critical thinking skills more broadly.

This business simulation supports student learning of important business finance skills including but not limited to business plan development, budgeting, variance analysis, capital budgeting and analysis of business valuation. Students act as entrepreneurs of a craft-brewery start-up company of their very own in this eight-step, hands on simulation which provides for a different experience for each student. Every step in the simulation comes with student instructions, peer review questions and an example to showcase one of many possible outcomes. An excel file providing templates for each of the quantitative steps in the simulation is also available upon request. Learning objectives line up well with an eight- or sixteen-week semester and can be used at either the undergraduate or graduate level.

Keywords: Start-Up, Business Finance, Simulation, Cost Elements, Budgeting, Variance Analysis, Breakeven Analysis, Payback, Capital Budgeting, Valuation

JEL Codes: A22, A23, G30, M13

Introduction

Financial management is a critical skill every entrepreneur must know (Mishra, 2020). An ability to discern the strengths and weaknesses of a firm's operational performance and financial position is essential know-how for management. Moreover, entrepreneurs must engage in proactive financial analysis to influence business decisions as well as attract capital from investors and creditors (Pratt, 1994).

Managing cash flow is key as many businesses fail due to cash flow problems. A recent study of unsuccessful entrepreneurs found that most attributed their lack of success to inadequate training with training in cash flow management especially lacking (Rogers, 2020). Having a marketable product or service to sell is not the issue, rather it is inexperience and inadequate training in managing the finances of one's firm that so often leads to stifled growth or worse, failure. A study by the Small Business Administration showed that seven out of ten new employer firms survive at least 2 years, half at least 5 years, a third at least 10 years, and a quarter stay in business 15 years or more (SBA, 2020).

Financial literacy of the entrepreneur clearly matters a great deal. Financial literacy improves entrepreneurs' skills, making them more confident in the decision-making process of savings and financial management of their enterprises (Cossa et al., 2018). Financial literacy is shown to exert large positive impacts on the performance of entrepreneurs, according to Klapper et al. (2018), specifically in terms of income, less debt, and retirement planning.

This business simulation was created to support the active learning of the must-have hard skill of financial management for aspiring entrepreneurs. Acting as entrepreneurs of a craft-brewery start-up company of their own, students engage with the material to learn important business finance skills. Business plan development, budgeting, variance analysis, capital budgeting and analysis of business valuation are at the center of this case.

The curriculum uses an eight-step, hands-on simulation provides a unique experience for each student involved. No two students should arrive at the exact same business outcome or find that they have the same business performance – such as is found in real life. This is accomplished with the use of variables selected by random-draw.

Instructors are supported in their use of this simulation with their students via:

- questions for each of the eight steps that have students reflect on the most important findings.
- an example for each of the eight steps to showcase the step requirements.
- an excel file providing templates for each of the quantitative steps in the simulation. Simply contact the author at cjbradbury@plymouth.edu for this file.

Teaching Strategies

This business simulation may be integrated in support of the active learning of students in an entrepreneurial-focused course and/or business finance-based course. The eight-steps align well with an eight-week or sixteen-week semester. The simulation is considered appropriate for upper-level, undergraduate courses as well as a graduate course. (I have used it in both.)

Instructors have the discretion to share or not share the example provided with each step with their students. The same goes for the excel templates in support of building a proforma, capital investment analysis, valuation, etcetera.

A valuable piece of this simulation curriculum is the peer review component. Since no two craft brewery companies will be exactly alike, students benefit from examining the work of their peers after completing the exercise on their own. This strengthens an understanding of the business finance concepts learned.

Learning Objectives and Appropriate Theory

The eight steps (or learning objectives) of the simulation are identified below. These are discussed in summary detail with the appropriate business finance application/theory shared.

1. Business Plan Summary - Where, What and Who are You?

Students prepare a summary of their brewery's business plan of which must include company summary information, info. on brand image, competition, products and business objective. Students can have fun here and let their creativity drive many of this. An appreciation for the importance of a well-constructed business proposal is critical for any aspiring entrepreneur.

Note: The case simulation starts with qualitative considerations, no numbers or analysis just yet.

2. General Business Model Definition – Cost Elements

In this step, the emphasis is on identifying startup costs, manufacturing costs, and non-manufacturing costs. Some guidance is provided in the instructions. This step seeks to nurture an appreciation for well identifying costs and cost drivers of the proposed business.

3. Proforma Analysis

Relevant assumptions must be identified and shared as well as an assessment of proforma results. Budgeting is a critical financial literacy skill for any entrepreneur. The proforma in this step is prepared on a twelve-month basis for year 1. Students are also encouraged to consider potential issues that may be expected while implementing the plan during Year 1.

Note: This is where the first random draw can be found and is used to determine the sales mix between the company's flagship beers.

4. Capital Structure / Break-Even and Payback Analysis

In this step, the emphasis is on identification of startup funding needs and capital funding sources as well as preparation of a break-even analysis and payback period analysis. This step is important! Entrepreneurs must understand the importance of the repayment schedule on business performance from funding sources. Moreover, business owners must have a firm handle on the impact of sales volume and price on profitability. The impact of Capital Structure and an understanding of Break-Even analysis is critical for any business owner.

Note: Another random draw can be found here providing for varied financing scenarios.

5. General Variance Analysis

Here students will both explore actual vs. budgeted performance by preparing a general variance analysis on a monthly basis as well as discuss some major risks faced by craft brewers. Note: A random draw is used to assign an internal or external environmental condition impacting the brewery in its first year of operation. Unforeseen things happen and entrepreneurs must appreciate this fact and learn to adapt!

6. Year 2 Operations

Operational performance results for year 2 are produced. These are based in part on previous assumptions and a growth rate factor on sales.

Note: The random draw determines the growth rate the student's business will experience in year 2.

7. Capital Budgeting

Step 7 analyzes capital expenditure investments required to sustain operational performance in-house instead of contracting with outside breweries to provide additional capacity. Remember that in step 6, student businesses experienced growth. An appreciation for the impact of this on profit margins and quality is reinforced. An understanding of the analysis of Operating Cash Flow and the Net Present Value criterion are central concepts in this step.

Note: The random draw determines the capital investment scenario for the business.

8. Valuation Analysis

In this final step of the case simulation, students are acclimated to the fact that a variety of techniques are available to assess the valuation of a business. Emphasis in this step is on the income-based approach where students must derive proforma Free Cash Flow, terminal value and the present value of all cash flows to approximate the value of the business. The step provides guidance on calculations, growth rate and cost of capital to be applied.

Note: The random draw is used to determine EBITDA growth and competitive risks associated with valuation of one's business.

Step 1 Assignment: Business Plan Summary - Where, What and Who are You?

Prepare a summary of your brewery's business plan. As a minimum, this should include: 1) Company Summary including brand image, 2) Competition, 3) Products (e.g. flagship beers), and 4) Business Objective.

The business plan summary should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations. (Note that all papers will be peer reviewed.)

1. **Company Summary** – The company summary should include brand image, brewery name, demographic (target market), and your business personality.
2. **Competition** - Identify the US geographical and demographic markets of your brewery. This step requires some research to be able to state why you think the location is suitable, including assessment of competition.
3. **Products** – Identify the beer styles that are your “flagship beers”. This is an important part of your identity, marketing and how you will compete in the marketplace. Choose 2 of the following four beer styles as your foundational products: IPAs, Belgian Ales, Imperial Stouts/Porters and Sours.
4. **Business Objective** – Describe the vision and goals of your brewery in terms of your business objective. Use the SMART (Specific, Measurable, Achievable, Relevant, and specific Timing) acronym as a guide to develop a meaningful, two- or three- sentence business objective.

Peer Review Questions

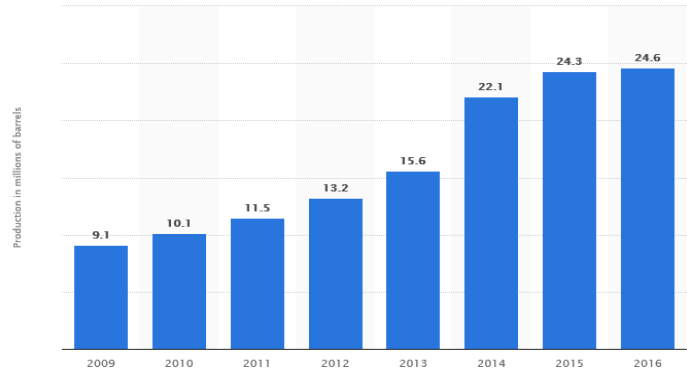
1. Did the Business Plan Summary describe how the brewery will differentiate itself from local and/or regional competitors?
2. Were the company's intended atmosphere, character, and vibe evident and concisely described?
3. Did the Business Objective adhere to the SMART guidelines? Was the objective:
 - a. Specifically identified,
 - b. Measurable by reasonable financial metrics,

- c. Achievable within the financial constraints of the startup,
- d. Relevant to a small business, and included
- e. Timing to achieve the objective is specifically identified?

Step 1 Example:

Blue Line Brewery – The Who, What and Where

Company Summary - Blue Line Brewery combines taproom sales with a self-distribution network to extract the maximum profitability from our production facility. The craft beer market continues to flourish; micro-breweries account for over 60% of the overall craft beer market growth in 2017 (Watson, 2017). Brewpubs are also on an increasing trajectory as they account for 16% of the overall market growth (Watson, 2017).



Craft Beer production has doubled in five years - Inducing many new startups to enter highly competitive market (Barrels produced ..., 2017)

To succeed in this market Blue Line Brewery will use: 1) tight production controls to maintain our image of high quality beer, 2) a balanced capital budgeting plan coupled with an expanding distribution network to support growth, and 3) a strong, personal relationship with clients and local distributors / sales outlets.

Our brand image targets the active millennial market. We provide a warm, unique and inviting atmosphere with clean open spaces. Blue Line Brewery is a safe haven from the chaos of everyday life while offering a venue to watch major sporting events in a small, friendly environment - all while enjoying some of the best craft beer that you've tasted.

Competition – Competition in the craft beer market is fierce with approximately 50% of brewpub startups failing (Gribbens, 2015). Low barriers to entry and relatively low startup costs (~\$300K) make this market attractive to many beer-loving entrepreneurs. Our primary target market is the under 40-year-old age group; 23% of craft beer purchases are made by millennials (Furnari, 2017). In addition, millennials sample over five new brands per month (6 Characteristics ..., 2015) so Blue Line Brewery will offer a variety of beer styles to address consumers' desire to explore new styles and tastes.

We're located in Nashville, TN. Tennessee is ranked in the Top-20 most attractive states for new breweries (Janish, 2014). Janish (2014) considered each State's attractiveness by considering beer consumed, craft beer produced, as well as the population's general interest in craft beer. Nashville's passionate support for the NHL Predators makes a sports themed brewery a natural selection. The large number of local bars also provides a large, natural, local self-distribution network.

Products - Our flagship beers will include IPAs and Porters. The IPA market continues to grow and our New England style IPA will be a cornerstone of our offerings. Porters will offer the necessary variety to satisfy a broad range of consumers.

Business Objective - We're starting as a small, innovative craft-brewery with a focus on the local Nashville market. Our five-year business objective is to achieve 25% year-over-year revenue growth by matching increased production capacity with a broader distribution network.

Step 2 Assignment: General Business Model Definition – Cost Elements

Prepare a summary of your brewery's business model that builds on the business plan and value proposition (e.g. differentiation from competitors) proposed in Step 1. In this step, the emphasis is on identifying startup costs, manufacturing costs, and non-manufacturing costs.

The business model description and discussion of cost elements should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations.

(Note that all papers will be peer reviewed.)

- **Manufacturing Capacity / Distribution Model** – First, describe the capacity and distribution model for your brewery at the start of your business. Balancing production capacity with a distribution model is critical for successful startup companies. Clearly state what should be considered as part of this decision-making process. Furthermore, use the geographical market/brand image from Step 1 to support your reasoning. Choose one of the following:
 - 3 BBL Nano-brewery with tasting room only [Cantebury Aleworks, Garrison City (Dover)]
 - 3 BBL Nano-brewery with self-distribution [Swift Current Brewery (Manchester)]
 - 15 BBL Craft-brewery with 50% tasting room and 50% self-distribution [Lithermans Limited (Concord), Able Ebenezer (Merrimack)]
 - 15 BBL Craft-brewery with 50% tasting room and 50% use distributor [Concord Craft (Concord), Woodstock Station (Woodstock)]
- **Startup Costs** – Identify the major startup costs for a craft brewery in pareto format (i.e. largest cost driver to the smallest).
- **Manufacturing Cost Drivers** – Identify cost drivers associated with craft beer manufacturing.
- **Period Costs** – Identify period costs associated with non-manufacturing aspects of the brewery, including but not limited to sales, marketing, and general administration costs of the brewery.

Peer Review Questions – Please support your responses with fact-based discussions

1. Was the proposed capacity and distribution plans consistent with the business plan described in Step 1?
2. Was the list of cost drivers presented with a discussion of the most significant manufacturing cost drivers?

3. Were all reasonable period costs identified including costs associated with marketing, distribution methods and general administration?

Step 2 Example:

General Business Model Definition (Cost Elements)

Manufacturing Capacity / Distribution Model – Blue Line Brewery is a 15 BBL craft-brewery production facility. Our goal is to produce 2,250 barrels of IPA and Porter per year. Assuming 3 brews per week, 15 BBL capacity, and 50 weeks during a year; we’ll produce 2,250 barrels (15 x 3 x 50) per year which provides over 700,000 servings (1 BBL = 330 12 oz. servings).

50% of the product will be sold in our tap room and 50% will be self-distributed throughout the Nashville area. Even though Nashville is not in the top 10 cities in terms of bars per capita (Forbes, 2012), it is a destination city for personal entertainment and corporate events. The local cultural scene is a natural outlet for our product; the Predators and Tennessee Titans are mainstays in the city. Using celebrity endorsers / influencers will solidify our brand as a Nashville brand – the intent is to use our hockey and football contacts to bring on a high-profile celebrity. S

Startup Costs – Having enough startup funds available is a critical success factor for every new small business. The largest startup investment will be the 15 BBL brewing system. The next largest startup costs will be the kegging and bottling/canning costs. Legal and licensing fees will also be required prior to opening the doors. Finally, the business will need working capital to conduct day-to-day operations.

Manufacturing Costs – Manufacturing and product costs typically include direct materials, direct labor and allocation of factory overhead. Direct labor consists of brewers and other manufacturing personnel. The majority of the direct material is related to the ingredients including the grain/malt, yeast and hops (Pomranz, 2017). Note that the cost of materials will vary dramatically from batch to batch. The containers (kegs, bottles, or cans) will also represent a significant cost, and is an important decision moving forward (Pricing Craft Beer ...). Just providing kegs is the simplest from an operations perspective, but it severely restricts local distribution. Cleaning supplies and maintenance costs will also need to be included in manufacturing costs. It is assumed that IPAs and Porters require about the same amount of time to produce per barrel so our overhead costs will not be allocated to product type.

Blue Line Brewery General Business Model - Cost Elements	
Startup Costs	
15 BBL Brewing System	
Bottling line (filler, crowner, labeler)	
Licencing / Legal	
Operating cash	
Manufacturing / Product Costs	
Direct labor	
Head brewers	
Other brew / operations staff	
Direct Material	
Malt / Hops	
Bottles / Cans	
Other ingredients	
Replacement parts / equipment	
Cleaning supplies	
Carriers	
Factory Overhead Allocation	
Period Costs	
Rent / Lease	
Advertising and marketing	
Labor (distribution)	
Tap room labor	
Accounting / Legal	
Utilities	
Building maintenance	
Licenses / Fees	
Equipment (depreciation)	
Insurance	

Period Costs – Period costs are associated with time, and not directly related to the product or manufacturing costs so they do not vary with the level of manufacturing. Period costs include selling and administrative activities. Rent expenses are the largest of the period costs. Labor for marketing, accounting, periodic maintenance and tap room will be accomplished by owners and friends / family to the maximum extent possible to avoid cash draws on the business.

Step 3 Assignment: Proforma Analysis

Prepare an annual proforma analysis, and show on a monthly basis. A random draw will be used to determine the sales mix between your two flagship beers. Please discuss all relevant assumptions used in preparing the proforma and further provide for an assessment of proforma results. Also, discuss what issues may be expected while implementing the plan during Year 1. Clearly identify any assumptions (including those from Step 1 and Step 2) used to complete the proforma.

The discussion should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations. (Note that all papers will be peer reviewed.)

For your proforma please make the following assumptions:

- Annual production volume: brewery size produced per week x 50 weeks per year x 3 brew sessions per week.
- Direct Labor, Direct Material and Variable manufacturing cost information per beer style per BBL: IPAs = \$200/BBL, Belgian Ale = \$175/BBL, Imperial Stouts/Porters = \$180/BBL and Sours = \$225/BBL.
- Gross margins on tasting room sales are 75% of revenues, self-distributed wholesale of kegs / cans is at 60% of revenues, and a distributor wholesale of kegs / cans at 45% of revenues. (Hint: Note that to find revenues, divide unit variable manufacturing cost by [1-margin].)
- Manufacturing Overhead cost information based on size of brewery: 3BBL = \$3,500/month, and 15BBL = \$12,000/month.
- Period costs are the administrative and sales costs not associated with production operations. Management salaries not included below:

\$2,500/mo.	3 BBL	Nano brewery – tasting room only
\$2,000/mo.	3 BBL	Nano brewery – self-distribution only
\$4,850/mo.	15 BBL	Craft brewery – 50% tasting room and 50% self-distribution
\$3,250/mo.	15 BBL	Craft brewery – 50% tasting room and 50% use distributor
- Management salaries set at \$4,500/month. Upon reaching full brewery production capacity, an additional 5% of sales will be taken in management compensation.

Random Draw – A random draw will be used to determine the sales mix between your two flagship beers.

- A. 50/50
- B. 60/40
- C. 70/30
- D. 80/20

Peer Review Questions – Please support your responses with fact-based discussions

1. Are the proforma assumptions properly addressed?
2. Is the annual proforma analysis in the spreadsheet accurate based upon the assumptions?
3. Does the proforma assessment appear on point, and were potential issues associated with Year 1 implementation reviewed?

Step 3 Example:

Proforma Analysis

Major Assumptions/Year 1 Issues Acknowledged – The major assumptions used in the analysis are summarized in the table below. The flagship beer ratio was 50% Porter and 50% IPA (Random Draw A). The distribution was assumed to be 50% tap room and 50% self-distribution from Step 2. In addition to the data provided, production volume was assumed to increase as the year progressed to address risks associated with lower than expected demand. For the 1st quarter, our assumption was that 40% of the brewery capacity was used. During the 2nd quarter, 60% of the capacity was used (see table below for major assumptions). For the last two quarters, the brewery was assumed to be producing at 75% and 100% of full-capacity, respectively. This production ramp-up rate seems reasonable for a startup brewery (Thread ..., 2015). Product quality for our initial brews is also a risk. Again, a slow ramp to full production minimizes our financial exposure to potentially low-quality batches. Note that additional management compensation at 5% of sales starts in the fourth quarter when production reaches full capacity. Tennessee also imposes a sales tax on beer and alcohol. Therefore, a 9% tax on all sales was included.

Proforma Results – At full production, the brewery is expected to yield 93.75 BBL per month for both IPAs and Porters. This production will generate approximately \$116K of revenue on a monthly basis. After subtracting direct labor, direct material, factory overhead, sales/administrative costs and sales tax, approximately \$43K of EBITDA will remain. If production and sales go according to plan, the annual revenue for the Year 1 Proforma will be \$955K and the EBITDA expectation is \$302K.

Sales Mix (IPA/Porter) - From Random Draw				
IPA	50%			
Porter	50%			
Distribution				
Tap Room GM	50%			
Self-distribution	50%			
Total Monthly Production (Full Capacity)	187.5	BBL		
IPA Monthly Production	93.75	BBL		
Porter Monthly Production	93.75	BBL		
Production System	15	BBL		
Number of Brew Weeks	50			
Brews per Week	3			
Period Costs (Monthly)	\$ 4,850			
Management Salaries	\$ 4,500	and	5%	of sales when reaching full capacity
Direct Labor / Direct Material				
IPA DL/DM	\$ 200	per BBL		
Porter DL/DM	\$ 180	per BBL		
Gross Margin				
Tap Room GM	75%			
Self-distribution GM	60%			
Manufacturing OH				
15 BBL	\$ 12,000	per month		
Rate of Production Sales/Growth				
	Q1	Q2	Q3	Q4
Taproom Growth (% of max cap)	40%	60%	75%	100%
Distribution Growth (% of max cap)	40%	60%	75%	100%
Estimated TN Sales Tax	9%			
Blue Line Brewery Proforma Analysis Assumptions				

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
IPA Monthly Production (BBL)	37.50	37.50	37.50	56.25	56.25	56.25	70.31	70.31	70.31	93.75	93.75	93.75	773.44
Porter Monthly Production (BBL)	37.50	37.50	37.50	56.25	56.25	56.25	70.31	70.31	70.31	93.75	93.75	93.75	773.44
Revenue													
IPA - Taproom	\$ 15,000	\$ 15,000	\$ 15,000	\$ 22,500	\$ 22,500	\$ 22,500	\$ 28,125	\$ 28,125	\$ 28,125	\$ 37,500	\$ 37,500	\$ 37,500	\$ 309,375
Porter - Taproom	\$ 13,500	\$ 13,500	\$ 13,500	\$ 20,250	\$ 20,250	\$ 20,250	\$ 25,313	\$ 25,313	\$ 25,313	\$ 33,750	\$ 33,750	\$ 33,750	\$ 278,438
IPA - Self-distribution	\$ 9,375	\$ 9,375	\$ 9,375	\$ 14,063	\$ 14,063	\$ 14,063	\$ 17,578	\$ 17,578	\$ 17,578	\$ 23,438	\$ 23,438	\$ 23,438	\$ 193,359
Porter - Self-distribution	\$ 8,438	\$ 8,438	\$ 8,438	\$ 12,656	\$ 12,656	\$ 12,656	\$ 15,820	\$ 15,820	\$ 15,820	\$ 21,094	\$ 21,094	\$ 21,094	\$ 174,023
Total	\$ 46,313	\$ 46,313	\$ 46,313	\$ 69,469	\$ 69,469	\$ 69,469	\$ 86,836	\$ 86,836	\$ 86,836	\$ 115,781	\$ 115,781	\$ 115,781	\$ 955,195
DL/DM													
IPA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 11,250	\$ 11,250	\$ 11,250	\$ 14,063	\$ 14,063	\$ 14,063	\$ 18,750	\$ 18,750	\$ 18,750	\$ 154,688
Porter	\$ 6,750	\$ 6,750	\$ 6,750	\$ 10,125	\$ 10,125	\$ 10,125	\$ 12,656	\$ 12,656	\$ 12,656	\$ 16,875	\$ 16,875	\$ 16,875	\$ 139,219
Total	\$ 14,250	\$ 14,250	\$ 14,250	\$ 21,375	\$ 21,375	\$ 21,375	\$ 26,719	\$ 26,719	\$ 26,719	\$ 35,625	\$ 35,625	\$ 35,625	\$ 293,906
Manufacturing OH	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 144,000
Period Costs	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 58,200
Management Salaries - Fixed Cost	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 54,000
Management Salaries - Variable Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 17,367
Revenue	\$ 46,313	\$ 46,313	\$ 46,313	\$ 69,469	\$ 69,469	\$ 69,469	\$ 86,836	\$ 86,836	\$ 86,836	\$ 115,781	\$ 115,781	\$ 115,781	\$ 955,195
Less DL/DM	\$ 14,250	\$ 14,250	\$ 14,250	\$ 21,375	\$ 21,375	\$ 21,375	\$ 26,719	\$ 26,719	\$ 26,719	\$ 35,625	\$ 35,625	\$ 35,625	\$ 293,906
Less Manufacturing OH	\$ 32,063	\$ 32,063	\$ 32,063	\$ 48,094	\$ 48,094	\$ 48,094	\$ 60,117	\$ 60,117	\$ 60,117	\$ 80,156	\$ 80,156	\$ 80,156	\$ 661,289
Less Period Costs (Except Mgt Salaries)	\$ 20,063	\$ 20,063	\$ 20,063	\$ 36,094	\$ 36,094	\$ 36,094	\$ 48,117	\$ 48,117	\$ 48,117	\$ 68,156	\$ 68,156	\$ 68,156	\$ 517,289
Less Management Salaries	\$ 15,213	\$ 15,213	\$ 15,213	\$ 31,244	\$ 31,244	\$ 31,244	\$ 43,267	\$ 43,267	\$ 43,267	\$ 63,306	\$ 63,306	\$ 63,306	\$ 459,089
Less Estimated Sales Tax	\$ 4,168	\$ 4,168	\$ 4,168	\$ 6,252	\$ 6,252	\$ 6,252	\$ 7,815	\$ 7,815	\$ 7,815	\$ 10,420	\$ 10,420	\$ 10,420	\$ 85,968
EBITDA	\$ 6,544	\$ 6,544	\$ 6,544	\$ 20,492	\$ 20,492	\$ 20,492	\$ 30,952	\$ 30,952	\$ 30,952	\$ 42,597	\$ 42,597	\$ 42,597	\$ 301,754

Blue Line Brewery Proforma Analysis

Step 4 Assignment: Capital Structure / Break-Even Analysis & Payback Period

Prepare a summary of your brewery's capital structure that builds on the business plan and financial data (and resulting EBITDA) prepared in previous steps. In this step, the emphasis is on identification of startup costs, associated repayment schedule, and preparation of a break-even analysis and payback period analysis.

The discussion of assumptions and results should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations. (Note that all papers will be peer reviewed.)

Start-up funding needs (uses) and capital funding sources – Generally speaking, funding will be necessary to support start-up operations of your brewery. Please use the estimated startup costs from the table below based on your brewery size and distribution methods identified in previous steps.

\$135,000	3BBL Nano brewery – tasting room only
\$80,000	3 BBL Nano brewery – self-distribution
\$350,000	15 BBLCraft brewery – 50% tasting room and 50% self-distribution
\$300,000	15 BBLCraft brewery – 50% tasting room and 50% use distributor

Random Draw – A random draw will be used to select one of the following financing scenarios.

- A. Kickstarter campaign provides 5% of funding need (donation), you inject 10% (do not expect to recoup your investment until after bank and outside investors are paid out!), outside investor provides 35% (debt: terms are 25% APR, 10 year amm), bank financing with Small Business Administration (SBA) guarantee provides final 50% needed (debt: terms are 10% APR and 15 year amm).
- B. You inject 20% (you've been saving, do not expect to recoup your investment until after bank and outside investors are paid out!), friend of the family provides 40% at favorable terms (debt: 8% APR and 20 year amm), bank financing with SBA guarantee provides final 40% needed (debt: terms are 10% APR and 15 year amm).
- C. You inject 10% (do not expect to recoup your investment until after bank and outside investors are paid out), outside investor provides 15% (debt: terms are 25% APR, 10 year amm), outsider investor provides 25% (equity: royalties at 2% of sales), bank financing with SBA guarantee provides final 50% needed (debt: terms are 10% APR and 15 year amm).
- D. Kickstarter campaign provides 10% of funding need (donation), you inject 15% (do not expect to recoup your investment until after bank and outside investors are paid out!), outside investor provides 25% (debt: terms are 25% APR, 10 year amm), outsider investor provides 25% (equity: royalties at 2% of sales), bank financing with SBA guarantee provides final 25% needed (debt: terms are 10% APR and 15 year amm).

Capital Structure – Determine repayment schedule based on finance scenario. Include the monthly payment amount (i.e. principal plus interest) for each loan, as well as the time period when each loan is paid off.

Break-Even Sales Analysis – Perform a breakeven analysis on proforma profit and loss statement and the repayment costs associated with the funding structure.

Procedure:

- Identify the behavior of all costs. Identify whether each is a fixed cost or variable cost.
- Find contribution margin (in dollars) and the contribution margin (CM) ratio on projected sales.
- Find break-even sales dollars by dividing total fixed costs by CM ratio.
- Margin of safety, if it exists, will be projected sales – breakeven sales.

Payback Period Analysis – Perform an analysis of payback period by finding how long it will take projected cash flow to cover the start-up cost.

Procedure:

- Note: Depreciation and Tax Rate – Assume that the tax rate is 25%, and that 75% of the initial investment can be depreciated over 7 years using a straight-line method.
- Find Earnings Before Interest & Taxes (EBIT) by subtracting non-cash items from EBITDA.
- Find Net Operating Profit After Tax (NOPAT) by multiplying EBIT by 1 minus the tax rate.
- Add back non-cash items to NOPAT to derive Operating Cash Flow (OCF).
- Calculate payback period by looking at how long it takes for OCF to cover startup costs.

Peer Review Questions – Please support your responses with fact-based discussions.

1. Is the repayment schedule accurate?
2. Are the break-even, margin-of-safety, and payback period correctly computed?
3. Are the break-even, margin-of-safety, and payback period indicative of a low, moderate, or high-risk investment?

Step 4 Example:

Capital Structure / Break-Even Analysis & Payback Period

Start-Up Funding Needs – As discussed in Step 2, having enough startup funds available is a critical success factor for every new small business. The total startup investment will be \$350K with the 15 BBL brewing system cost the most demanding. The next largest startup costs will be the kegging and bottling/canning costs. Bottling / canning costs add a significant layer of manufacturing equipment costs, but are required to support our self-distribution goals. Legal and licensing fees will also be required prior to opening the doors. Finally, the business will need working capital to handle day-to-day operations.

Blue Line Brewery General Business Model - Cost Elements	
Startup Costs	
15 BBL Brewing System	
Bottling line (filler, crowner, labeler)	
Licencing / Legal	
Operating cash	

Capital Structure – Random Draw A was assigned and the funding sources are summarized in the table below. Two funding sources require repayment per the agreed-to terms. The outside investment option will require a \$2,787 monthly repayment of principle and interest over ten years. The Small Business Administration (SBA) guaranteed loan will require a \$1,881 monthly payment over 15 years. Note that the personal loan will not be repaid until out investors have

Startup Cost		\$ 350,000 15 BBL, 50% tasting room and 50% self-distribution				
Financing Secenario #1		Amount	APR	Term (Yr.)	Monthly Payment	
Kickstarter	5%	\$ 17,500	Donation	N/A		
Personal	10%	\$ 35,000				Repayment after all other sources
Outside Investment	35%	\$ 122,500	25%	10	(\$2,786.79)	
SBA Bank Investment	50%	\$ 175,000	10%	15	(\$1,880.56)	
Total	100%	\$ 350,000				

Blue Line Brewery Start-Up Cost and Financing Scenario

been paid in full.

Breakeven and Payback Analysis – Based on the \$350K startup investment and the proforma data from Step 3, Blue Line Brewery will have a contribution margin (CM) of \$558K at the end of Year 1 with a 58% CM ratio; this yields a \$534K breakeven (see tables below). This seems potentially optimistic for two reasons. First, the ability of a startup brewery to produce and sell nearly 1,550 BBL in the first year will be challenging. Our proforma analysis is prudent in assuming a ramp-up period but sales on pace with production is unlikely especially during this start-up phase. Second, there may be unexpected risks encountered during the first year that may not have been considered in the analysis. As such, the proforma analysis might be viewed as a

Payback Analysis (OCF)		
	Year 1	Year 2
Start Up Financing	\$ (350,000)	
Shortfall/Excess	\$ (114,309)	\$ 278,438
Payback (Years)	1.29	
Months	15.5	

Breakeven Analysis		
Total Sales	\$ 955,195	
Total Variable Costs	\$ 397,241	
Contribution Margin	\$ 557,954	(Sales - Variable Costs)
CM Ratio	58%	(CM / Sales)
Breakeven	\$ 534,488	(Fixed Costs / CM Ratio)
Margin of Safety (MOS)	\$ 420,707	(Sales - Breakeven)

best-case scenario for our start-up brewery. However, the proforma analysis suggests that the investment is sound as indicated by Year 1 proforma operations in excess of the break-even point; providing for a \$421K margin of safety which is indicative of a low to moderate risk position. Moreover, payback period of 15-months appears reasonable. Even if unanticipated risks are encountered the analysis suggests that our business will be financially positioned to deal with potential unknown risks.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
Fixed Costs:													
Manufacturing OH	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 144,000
Period Costs	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 58,200
Management Salaries	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 54,000
Repayment Schedule	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 4,667	\$ 56,008
TOTAL	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 26,017	\$ 312,208
Variable Costs:													
DM/DL/V OH - IPAs	\$ 7,500	\$ 7,500	\$ 7,500	\$ 11,250	\$ 11,250	\$ 11,250	\$ 14,063	\$ 14,063	\$ 14,063	\$ 18,750	\$ 18,750	\$ 18,750	\$ 154,688
DM/DL/V OH - Porters	\$ 6,750	\$ 6,750	\$ 6,750	\$ 10,125	\$ 10,125	\$ 10,125	\$ 12,656	\$ 12,656	\$ 12,656	\$ 16,875	\$ 16,875	\$ 16,875	\$ 139,219
Management Salaries	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 5,789	\$ 5,789	\$ 5,789	\$ 17,367
Estimated Sales Tax	\$ 4,168	\$ 4,168	\$ 4,168	\$ 6,252	\$ 6,252	\$ 6,252	\$ 7,815	\$ 7,815	\$ 7,815	\$ 10,420	\$ 10,420	\$ 10,420	\$ 85,968
TOTAL													\$ 397,241
Sales	\$ 46,313	\$ 46,313	\$ 46,313	\$ 69,469	\$ 69,469	\$ 69,469	\$ 86,836	\$ 86,836	\$ 86,836	\$ 115,781	\$ 115,781	\$ 115,781	\$ 955,195
Blue Line Brewery Total Sales and Total Costs													

Initial Investment	\$	(350,000)											
Assumed Tax Rate		25%											
Straightline Depreciation	\$	(37,500)	75% of startup capital, 7 year depreciation										
			Year 1	Year 2	Year 3	Year 4	Year 5	Year 6					
EBITDA			\$ 301,754	\$ 511,163	\$ 511,163	\$ 511,163	\$ 511,163	\$ 511,163	\$ 511,163				
less Depreciation/Amortization			\$ (37,500)	\$ (37,500)	\$ (37,500)	\$ (37,500)	\$ (37,500)	\$ (37,500)	\$ (37,500)				
EBIT			\$ 264,254	\$ 473,663	\$ 473,663	\$ 473,663	\$ 473,663	\$ 473,663	\$ 473,663				
1 - tax rate			0.75	0.75	0.75	0.75	0.75	0.75	0.75				
NOPAT = EBIT * (1-tax rate)			\$ 198,191	\$ 355,247	\$ 355,247	\$ 355,247	\$ 355,247	\$ 355,247	\$ 355,247				
add back Depreciation/Amortization			\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500	\$ 37,500				
Operating Cash Flow = NOPAT + Non-Cash items			\$ 235,691	\$ 392,747	\$ 392,747	\$ 392,747	\$ 392,747	\$ 392,747	\$ 392,747				

Step 5 Assignment: General Variance Analysis

Discuss the major risks faced by craft brewers and prepare an annual general variance analysis (show on a monthly basis). The variance analysis should compare the actual performance to the budgeted performance from Step 4. A random draw will be used to determine internal and external environmental conditions that impact your brewery throughout the first year of operation. Please discuss the variance results and the reasonableness of all assumptions. Clearly identify any additional assumptions used to complete the assessment of business risk and associated variances.

The discussion should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations. (Note that all papers will be peer reviewed.)

Random Draw – A random draw will be used to determine internal and external environmental conditions that impact your brewery throughout the first year of operation.

- A. Hot summer has led to sales of imperial stouts and porters down 20% for 3 months, and sales of Belgian Ales is up 20% for 3 months. Associated drought demolishes hop crop for IPAs so ingredients up \$25/BBL for IPAs.
- B. IPAs have become very popular – if you sell IPAs, increase your margins 5% for the entire year. Sours have also gained tremendous popularity in the market providing for a 15% rise in their margins. Margins for Belgian Ales are up 7%, and margins for Stouts and Imperial Porters are down 5%.
- C. You lost a major account – business is down 2% for the year.
- D. Congratulations, you're awarded #1 Brewery in your state and the award leads to a 10% jump in margins for 6 months.
- E. Your head brewer un-expectantly gave his notice – you lose 30% of your business for 4 months as you find a suitable replacement.
- F. Bad batch of beer owing to poor yeast health results in 50% loss in business for 2 months.
- G. Due to changes in environmental laws, you need to make changes to waste-water management which results in an extra cost of \$10/BBL for all beer styles.
- H. You're sitting on idle inventory because demand has not been as strong as predicted – sales are down 8% for the last 7 months of the year.
- I. Employee morale is great. Production efficiencies are up 15% for the last 6 months of the year.
- J. A competing taproom and brewery opens in your area – taproom sales are down 18% for the last 7 months of the year. All other distribution methods are down 3% for the same period.
- K. Even though the brewing process generally removes bacteria, contaminants have found their way into your product – you lose 75% of your business for 3 months (months 6, 7, and 8) as you identify and correct the contamination root cause.

- L. Two giant brewers (Anheuser-Busch InBev and MillerCoors) continue to buy craft breweries and launch their own craft brands – you lose 24% in business over the entire year.
- M. Your customers begin to experience price fatigue and are no longer willing to pay the same premium price – your gross margins decrease 15% for all products and your sales decrease 5% across all products.
- N. A health scare related to craft beer manufacturing rocks the entire industry and consumers switch to safer national brands – you lose 40% of your sales for three of the four quarters in your first year.

For reference, note that if sales dollars increase 10% then resulting sales will be 1.1 x existing sales dollars. Accordingly, if margins improve 15%, resulting margins will be 1.15 x existing margin percentage.

Peer Review Questions – Please support your responses with fact-based discussions

1. Was the discussion of business risks comprehensive and applicable to craft breweries?
2. How likely is it that a brewer may actually have to deal with the assumed environmental/market impact; and should the brewer have anticipated the risk and prepared a proforma plan that dealt with the risk?
3. Was the general variance analysis correct based on the assumed environmental/market impact?

Step 5 Example:

General Variance Analysis

Major Assumptions – Blue Line Brewery’s actual performance was dramatically improved over the projected performance because our brewery was recognized the #1 Brewery in Tennessee (Random Draw D). As a result, our margins on both IPAs and Porters increased by 10% during the last 6 months of the years. These six months were also the period when production reached 75% and finally full capacity along the production ramp discussed in Step 3.

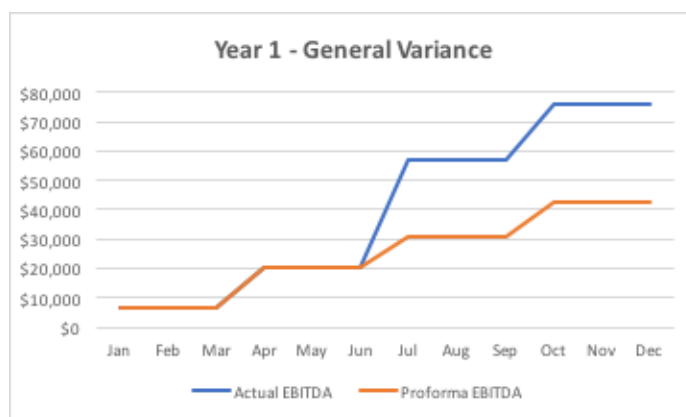
Major Risks – Risk management is important to all businesses, and especially small startup businesses. In many cases, smaller businesses have more trouble absorbing the costs of associated risks compared to larger businesses. Major risks include demand forecasting errors, equipment problems, poor product, and overall supply chain issues (Gordon, 2012; Sullivan, 2012). The first risk category is related to forecasting errors, and demand is often the most difficult metric to predict. Local competitors, overall craft brewery market, and even the large

Sales Mix (IPA/Porter) - From Random Draw				
IPA	50%			
Porter	50%			
Distribution				
Tap Room GM	50%			
Self-distribution	50%			
Total Monthly Production	187.5	BBL		
IPA Monthly Production	93.75	BBL		
Porter Monthly Production	93.75	BBL		
Production System	15	BBL		
Number of Brew Weeks	50			
Brews per Week	3			
Period Costs (Monthly)	\$ 4,850			
Management Salaries	\$ 4,500	and	5% of sales when reaching full capacity	
Direct Labor / Diect Material				
IPA DL/DM	\$ 200	per BBL		
Porter DL/DM	\$ 180	per BBL		
Gross Margin	Month 1-6	Month 7-12		
Tap Room GM	75%	83%		
Self-distribution GM	60%	66%		
Manufacturing OH				
15 BBL	\$ 12,000	per month		
Rate of Production Sales/Growth	Q1	Q2	Q3	Q4
Taproom Growth (% of max cap)	40%	60%	75%	100%
Distribution Growth (% of max cap)	40%	60%	75%	100%
Depreciation Method	Straight line over seven years			
Tax Rate	25%			
Estimated TN Sales Tax	9%			
Blue Line Brewery General Variance Analysis Assumptions				

Random Draw Selection = D
 Congratulations, you're awarded #1
 Brewery in your state, leads to a 10%
 jump in margins for 6 months.

national beer distributors can directly impact a small brewery's beer demand. The second and third risks are associated with equipment malfunctions and poor product quality. Poor product can range from a bad batch of beer to a health scare related to the entire market. The last of the four risk groups is supply chain risk which is also hard to accurately predict. Poor supplier product/quality, late product deliveries, and price variations each impact the projected success for small breweries.

Results – The 10% margin increase resulted in an overall Gross Margin equal to 83% and 66% on our tap room and self-distribution sales, respectively, during the last six months of the year. This resulted in our actual performance increasing by \$178K EBITDA for Year 1 compared to our proforma estimates. The monthly increases are shown in the figure to the right. The Margin of Safety increased by \$245K, Operating Cash Flow increased to \$369K, and the Payback changed from 15.5 months in the proforma analysis to 11.4 months. Being rated the #1 Brewery in Tennessee was an unexpected surprise that improved our bottom line versus projections. We were also fortunate that our other projections were relatively close to actual results.



Year 1 Variance - Breakeven Analysis			
	Year 1	Proforma	Delta
Total Sales	\$ 1,156,765	\$ 955,195	\$ 201,569
Total Variable Costs	\$ 421,141	\$ 397,241	\$ 23,900
Contribution Margin	\$ 735,623	\$ 557,954	\$ 177,669 (Sales - Variable Costs)
CM Ratio	64%	58%	5% (CM / Sales)
Breakeven	\$ 490,946	\$ 534,488	\$ (43,542) (Fixed Costs / CM Ratio)
Margin of Safety (MOS)	\$ 665,819	\$ 420,707	\$ 245,111 (Sales - Breakeven)

Year 1 Variance - Operating Cash Flow		
	Year 1	Proforma
EBITDA	\$ 479,423	\$ 301,754
less Depreciation/Amortization	\$ (37,500)	\$ (37,500)
EBIT	\$ 441,923	\$ 264,254
1 - tax rate	0.75	0.75
NOPAT = EBIT * (1-tax rate)	\$ 331,442	\$ 198,191
add back Depreciation/Amortization	\$ 37,500	\$ 37,500
Operating Cash Flow = NOPAT + Non-Cash items	\$ 368,942	\$ 235,691

Year 1 Variance - Payback (OCF)	
Start Up Financing	\$ (350,000)
Shortfall/Excess	\$ 18,942
Payback (Years)	0.949
Payback (Months)	11.4

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
IPA Monthly Production (BBL)	37.50	37.50	37.50	37.50	56.25	56.25	70.31	70.31	70.31	93.75	93.75	93.75	773.44
Porter Monthly Production (BBL)	37.50	37.50	37.50	37.50	56.25	56.25	70.31	70.31	70.31	93.75	93.75	93.75	773.44
Revenue													
IPA - Taproom	\$ 15,000	\$ 15,000	\$ 15,000	\$ 22,500	\$ 22,500	\$ 22,500	\$ 40,179	\$ 40,179	\$ 40,179	\$ 53,571	\$ 53,571	\$ 53,571	\$ 393,750
Porter - Taproom	\$ 13,500	\$ 13,500	\$ 13,500	\$ 20,250	\$ 20,250	\$ 20,250	\$ 36,161	\$ 36,161	\$ 36,161	\$ 48,214	\$ 48,214	\$ 48,214	\$ 354,375
IPA - Self-distribution	\$ 9,375	\$ 9,375	\$ 9,375	\$ 14,063	\$ 14,063	\$ 14,063	\$ 20,680	\$ 20,680	\$ 20,680	\$ 27,574	\$ 27,574	\$ 27,574	\$ 215,074
Porter - Self-distribution	\$ 8,438	\$ 8,438	\$ 8,438	\$ 12,656	\$ 12,656	\$ 12,656	\$ 18,612	\$ 18,612	\$ 18,612	\$ 24,816	\$ 24,816	\$ 24,816	\$ 193,566
Total	\$ 46,313	\$ 46,313	\$ 46,313	\$ 69,469	\$ 69,469	\$ 69,469	\$ 115,632	\$ 115,632	\$ 115,632	\$ 154,175	\$ 154,175	\$ 154,175	\$ 1,156,765
DL/DM													
IPA	\$ 7,500	\$ 7,500	\$ 7,500	\$ 11,250	\$ 11,250	\$ 11,250	\$ 14,063	\$ 14,063	\$ 14,063	\$ 18,750	\$ 18,750	\$ 18,750	\$ 154,688
Porter	\$ 6,750	\$ 6,750	\$ 6,750	\$ 10,125	\$ 10,125	\$ 10,125	\$ 12,656	\$ 12,656	\$ 12,656	\$ 16,875	\$ 16,875	\$ 16,875	\$ 139,219
Total	\$ 14,250	\$ 14,250	\$ 14,250	\$ 21,375	\$ 21,375	\$ 21,375	\$ 26,719	\$ 26,719	\$ 26,719	\$ 35,625	\$ 35,625	\$ 35,625	\$ 293,906
Manufacturing OH	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 144,000
Period Costs	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 58,200
Mgt Salary - Fixed Cost	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 54,000
Mgt Salary - Variable Cost	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 7,709	\$ 7,709	\$ 7,709	\$ 23,126
Revenue	\$ 46,313	\$ 46,313	\$ 46,313	\$ 69,469	\$ 69,469	\$ 69,469	\$ 115,632	\$ 115,632	\$ 115,632	\$ 154,175	\$ 154,175	\$ 154,175	\$ 1,156,765
Less DL/DM	\$ 14,250	\$ 14,250	\$ 14,250	\$ 21,375	\$ 21,375	\$ 21,375	\$ 26,719	\$ 26,719	\$ 26,719	\$ 35,625	\$ 35,625	\$ 35,625	\$ 293,906
Less Manufacturing OH	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 12,000	\$ 144,000
Less Period Costs	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 4,850	\$ 58,200
Less Management Salaries	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 4,500	\$ 54,000
Less Estimated Sales Tax	\$ 4,168	\$ 4,168	\$ 4,168	\$ 6,252	\$ 6,252	\$ 6,252	\$ 10,407	\$ 10,407	\$ 10,407	\$ 13,876	\$ 13,876	\$ 13,876	\$ 104,109
EBITDA	\$ 6,544	\$ 6,544	\$ 6,544	\$ 20,492	\$ 20,492	\$ 20,492	\$ 57,156	\$ 57,156	\$ 57,156	\$ 75,616	\$ 75,616	\$ 75,616	\$ 479,423
Actual EBITDA	\$ 6,544	\$ 6,544	\$ 6,544	\$ 20,492	\$ 20,492	\$ 20,492	\$ 57,156	\$ 57,156	\$ 57,156	\$ 75,616	\$ 75,616	\$ 75,616	\$ 479,423
Proforma EBITDA	\$ 6,544	\$ 6,544	\$ 6,544	\$ 20,492	\$ 20,492	\$ 20,492	\$ 30,952	\$ 30,952	\$ 30,952	\$ 42,597	\$ 42,597	\$ 42,597	\$ 301,754
Variance	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 26,204	\$ 26,204	\$ 26,204	\$ 33,019	\$ 33,019	\$ 33,019	\$ 177,669

Blue Line Brewery Year 1 General Variance

Step 6 Assignment: Year 2 Operations

Provide Year 2 operational performance results based in part on previous assumptions (prior to the Step 5 random draw that impacted Year 1 performance only) and the growth rate to be determined below. If additional brewing capacity is required, assume that your brewery subcontracts with another brewery for the following fees per beer style: IPAs = \$325/BBL, Belgian Ales = \$300/BBL, Imperial Stouts/Porters = \$305/BBL and Sours = \$350/BBL. These costs assume that the contracted brewery will incur all variable manufacturing related costs.

Provide insight into considerations that need to be made given the growth experienced during Year 2. This is important. Changes in some of the previous assumptions may be warranted.

The discussion should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations. (Note that all papers will be peer reviewed.)

Random Draw* – A random draw will be used to determine Year 2 growth (apply to Year 1 performance assumptions prior to Step 5 random draw).

- A. Growth of 33%
- B. Growth of 50%
- C. Growth of 67%
- D. Growth of 80%

Peer Review Questions – Please support your responses with fact-based discussions

1. Was a discussion of relevant considerations and/or changes in previous assumptions for Year 2 provided?
2. Was the Year 2 operational analysis correct?
3. What additional considerations do you feel should have been included in this analysis?

**Author's Note: It should be recognized that a decline in annual sales performance could also be a reality for any business; unfortunate as it might be. For educational purposes (so as to move to step 7), only growth was assumed.*

Step 6 Example:

Year 2 Operations

Major Assumptions – Random Draw B indicated 50% growth in Year 2. The assumptions used in the Year 2 Operations analysis include:

- Increased production - 50% growth achieved via contracted brewing with a \$325/BBL fee for IPAs and \$305/BBL fee for Porters
- No additional CAPEX investment required
- 50/50 sales mix between IPAs and Porters (no change)
- 50/50 split between tap room and self-distribution (no change)
- Margins return to pre-#1 Brewery Award levels per random card drawn in Step 5
- Manufacturing OH remains at \$12,000/month for a 15 BBL system
- Period costs: increased administrative and sales costs (\$10,000/month). Management compensation remains at \$4,500/month + 5% of sales (brewery is operating at full capacity).

To start Year 2, Blue Line Brewery made a decision to increase capacity by 50% by contracting with an outside brewer. Therefore, no Capital Expenditure (CAPEX) investment was required. Our in-house brewery was operating at peak capacity by the end of Year 1 and is expected to remain at this level in Year 2.

We chose to keep the sales mix the same for Year 2 (50% IPAs and 50% Porters). In future years, we intend to offer a wider selection, but in Year 2 the strategy was to stay with a proven product. We also elected to keep the tap room and self-distribution model. Following the announcement that we were named the #1 Brewery in Tennessee our gross margins increased

Sales Mix (IPA/Porter) - From Random Draw				
IPA	50%		No change	
Porter	50%		No change	
Distribution				
Tap Room	50%		No change	
Self-distribution	50%		No change	
Total Monthly Production	187.5	BBL	No change	
IPA Monthly Production	93.75	BBL	No change	
Porter Monthly Production	93.75	BBL	No change	
Production System	15	BBL	No change	
Number of Brew Weeks	50		No change	
Brews per Week	3		No change	
Contracted Capacity Percent Increase	50%			
Contracted Brewing Capacity (IPA)	46.88			
Contracted Brewing Capacity (Porter)	46.88			
Contracted Brewing Cost (IPA)	\$ 325	per BBL		
Contracted Brewing Cost (Porter)	\$ 305	per BBL		
Period Costs (Monthly)	\$ 10,000		Period costs increased due to administrative and sales for additional volume	
Period Costs (Monthly Salaries)	\$ 4,500	and	5%	of sales when reaching full capacity and profit from contracted efforts.
Direct Labor / Direct Material				
IPA DL/DM	\$ 200	per BBL	No change	
Porter DL/DM	\$ 180	per BBL	No change	
Gross Margin				
Tap Room GM	75%		No change	
Self-distribution GM	60%		No change	
Manufacturing OH				
15 BBL	\$ 12,000	per month	No change	
Production Capacity Utilization				
	Q1	Q2	Q3	Q4
Taproom Growth (% of max cap)	100%	100%	100%	100%
Distribution Growth (% of max cap)	100%	100%	100%	100%
Operate 15 BBL system at 100% capacity and add contracted brewing for additional production				
Depreciation Method				
	Straight line over seven years		No change	
Tax Rate				
	25%		No change	
Estimated TN Sales Tax				
	9%		No change	

Step 6 Random Draw Selection = 50% increase

- Increase capacity by contracting for additional needs
- Assume no CAPEX investments
- 50/50 sales mix between IPAs and Porters
- 50/50 split between tap room and self-distribution
- Margins return to pre #1 Brewery Award levels per random card drawn in Step 5
- Manufacturing OH remains at \$12,000 / month
- Period costs: increased administrative and sales costs (\$10000/month) + [management salaries (\$4500/month) + 5% of sales]

Blue Line Brewery Year 2 Operational Assumptions

dramatically for 6 months. The margins returned to original levels after 6 months; so, we reverted back to the pre-award levels to start Year 2. See figure below for list of assumptions.

Costs and EBITDA Results – Our DL/DM costs per BBL remained the same for IPAs and

Porters. Our manufacturing OH costs remained at \$12,000 per month. Our period costs increased to \$10,000 for several reasons. First, our administrative costs increased to accommodate the larger production volume. Second, our sales costs also increased because we stepped up our local distribution. We're moving substantially more product in Year 2 compared to Year 1. Additionally, total management compensation dollars rose as this is tied to revenue growth. We feel this is appropriate given that management should begin to share in the successes of the company so long as sufficient earnings can be retained within the business to foster future growth needs.

EBITDA	\$ 692,419
less Depreciation/Amortization	\$ (37,500)
EBIT	\$ 654,919
1 - tax rate	75%
NOPAT = EBIT * (1-tax rate)	\$ 491,189
add back Depreciation/Amortization	\$ 37,500
Operating Cash Flow = NOPAT + Non-Cash Items	\$ 528,689

Due to the increased production volume and continued sales success, EBITDA increased from \$479K in Year 1 to \$692K in Year 2 and Operating Cash Flow increased to \$529K (up from \$369K). Our Debt/EBITDA ratio (\$350K/\$692K) is less than 1 which is strong and supports growth objectives. Our intent is to reinvest much of our earnings back into the business as we continue to grow.

Step 7 Assignment: Capital Budgeting

In Step 6, Year 2 operational performance was based in part on previous assumptions, growth rate-experienced and resulting operating considerations, but no capital expenditures (CAPEX) were assumed. Step 7 analyzes CAPEX investments required in Year 2 to sustain operational performance in-house instead of contracting with outside breweries to provide additional capacity. Building up in-house capacity preserves gross margins that are substantially higher than contracted margins. In addition, brewing in-house helps ensure that quality is maintained, and additional production capabilities exist.

Provide a discussion of assumptions including any adjustments required for manufacturing and possibly period costs. Assume that this capital budgeting analysis is conducted in Year 2 and further that any CAPEX acquisition will occur in the latter half of Year 2 to support Year 3 production. Use a Net Present Value (NPV) assessment to determine the financial viability of the proposed CAPEX investment. Use a five-year production time period (Years 3 – 7) and a 14% discount rate in your analysis.* Calculate NPV by finding the difference between the sum of the present values for Operating Cash Flows (OCF) at the end of Years 3 - 7 and the initial cash outlay at end of Year 2.

The discussion should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations. (Note that all papers will be peer reviewed.)

Random Draw – Random draws will not be used in this step. Instead, utilize assumptions in Step 3 to determine the appropriate CAPEX investment scenario. In each scenario, assume that Year 3 production levels with the CAPEX investment remains equal to the levels achieved in Step 6 with outsourcing. This will be achieved via added brew sessions during the week and the purchase of additional fermenters, a new cooling system, investment in infrastructure build-out, and working capital as well as additional production space and storage. No resale of the original equipment is anticipated so continued depreciation of that equipment is warranted. For the new investment, assume that the tax rate is 25%, and that 75% of the investment can be depreciated over 7 years using a straight-line method.

- A. If 3 BBL system, assume associated investment cost is \$175K
- B. If 15 BBL system, assume associated investment cost is \$275K

Peer Review Questions – Please support your responses with fact-based discussions.

1. Was the discussion of changes related to manufacturing and period costs comprehensive and reasonable?
2. Were Years 3 – 7 Operating Cash Flow (OCF) figures correct?
3. Was the NPV capital budgeting analysis correct?

Step 7 Example:

Capital Budgeting

Major Assumptions – The capital budgeting analysis compares additional brewing capacity obtained from contracting for outside brewing to a CAPEX investment. In each scenario, production capacity was maintained at the Year 2 level of 281 BBL. The CAPEX scenario includes a \$275K investment in Year 2 that maintains (i.e. no growth) production capacity in our 3rd year of operation, but uses a CAPEX investment instead of outsourcing production. This represents a conservative assessment of overall growth for our brewery in the out years. Monthly period costs were kept constant. Monthly manufacturing OH costs were increased, up from \$12,000 to \$14,500, to reflect the impact the additional volume will have on utilities, insurance, and other fixed and semi-fixed production related cost. Note that our distribution remains at 50% Tap Room and 50% Self-Distribution. A discount rate of 14% and a five year production timeline were used for the NPV calculations.

Results – The Operating Cash Flow for Years 3 – 7 is \$529K when outsourcing used to increase overall capacity. The NPV of these cash flows is \$1,815K.

Year 3 EBITDA	\$ 692,419						
less Depreciation/Amortization	\$ (37,500)						
EBIT	\$ 654,919						
1 - tax rate	75%						
NOPAT = EBIT * (1-tax rate)	\$ 491,189						
add back Depreciation/Amortization	\$ 37,500						
Operating Cash Flow = NOPAT + Non-Cash Items	\$ 528,689						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
Operating Cash Flow w/ increased outsourcing			\$ 528,689	\$ 528,689	\$ 528,689	\$ 528,689	\$ 528,689
NPV (Years 3-7) =	\$ 1,815,032						

**Author's Note: Discount rate applied is rooted in a cost of capital estimate drawing cost of equity from the build-up model (=risk-free return + equity premium + size premium + industry premium + company specific risk premium). Proxy for the risk-free rate is the current 20-year treasury rate and premiums derive from the Ibbotson SBBI classic yearbook: market results for stocks, bonds, bills and inflation.*

Step 8 Assignment: Valuation Analysis

There are a variety of techniques available to assess the value of companies including small start-ups. Some more appropriate for growing microbreweries than others. The three general valuation techniques include: 1) asset based assessments, 2) market based assessments, and 3) income based assessments. Asset based valuations are primarily based on the unencumbered market valuation of the brewery's equipment and existing inventory. Intangibles are hard to quantify and another noted weakness with this approach is that a business is more than the sum of its parts. Market based assessments utilize recent sales of similar business within similar geographical regions. Ensuring comparability of size and geography, as well as having a sufficient number of arms-length recent sales transactions is essential to this valuation approach. Income based valuation assessments place emphasis on the underlying cash flows of the business. The value ultimately depends on the present value of the business' future free cash flows. While forecasting is not precise, the income based approach provides a quantitative analysis of future risk and reward and so will be the focus of this valuation assignment.

Building off of the decisions implemented in Step 7, provide an income based assessment by first projecting the future free cash flows (FCF) of the business for Years 3-7. All production will take place in-house with existing infrastructure (no additional capital equipment will be purchased). For this Step, Year 3 EBITDA will be as calculated in Step 7 and a random draw selection will influence EBITDA growth in the outyears.

Next, derive an estimate of the business' continuation value at the end of the forecast horizon using a 5% growth rate*. This is known as terminal value (TV).

Third, find the present value for all forecasted cash flows, including the terminal value. Continue to use 14% as the cost of capital for the business. Future cash flows will be discounted based on this cost of capital estimate**.

Random Draw – A random draw will be used to determine EBITDA growth and the competitive risks associated with the valuation of your business.

- A. Steady business with established and solid market position. Head brewer agrees to sign multi-year contract with new owners. Assume a 25% EBITDA growth rate in Years 4 - 7.
- B. Steady business but with some earnings variability, and a few competitors in non-saturated market. Owner and head brewer agree to sign a three-year contract with built in longer-term non-compete clauses. Assume a 15% EBITDA growth rate in Years 4 - 7.
- C. Steady business but with some earnings variability in a crowded market space. Assume a 5% EBITDA growth rate in Years 4 - 7.

Forecasting Free Cash Flow Years 3 – 7 – When projecting the future free cash flows (FCF) of the business, future net operating working capital needs (increase in NOWC) and reinvestment in capital expenditures (CAPEX) should be considered.

Free Cash Flow = Operating Cash Flow – (increase in Net Operating Working Capital + Capital Expenditures)

Assume that the annual percent growth in NOWC and CAPEX growth is 10% of EBITDA.

Calculating Terminal Value - To estimate a continuation value in Year 7 using discounted cash flows of FCF, it is common practice to assume a constant expected growth rate in cash flows (g) also known as “the Gordon Model” and a constant debt-equity ratio.

$$\text{Terminal Value in Year 7} = \text{FCF}_{\text{year 7}} * (1 + g_{\text{cf}}) / (\text{WACC} - g_{\text{cf}})$$

where $g_{\text{cf}} = 5\%$ and WACC (which is the weighted average cost of capital) = 14%

Include a comprehensive discussion of all assumptions used in the valuation. Please discuss some important qualitative considerations that the prospective seller should include while considering valuation. The discussion should be at least one page in length using 1.15 line spacing and 11 point Calibri font. Please include all relevant citations. (Note that all papers will be peer reviewed.)

Peer Review Questions – Please support your responses with fact-based discussions.

1. Were the free cash flow calculations for Years 3 – 7 as well as terminal value as of Year 7 accurate?
2. Was the overall valuation (applying net present value) for the business accurate?
3. If one were a prospective buyer, what offer should he/she make for this business - support using quantitative (valuation) assessment and possible relevant qualitative considerations?

** Growth rate of 5% based on TABLE 5-2 Guidelines for Company Growth Assumptions in DCF Models Source: Nelling, Business Valuation Demystified, McGraw-Hill, 2011.*

Type of company	High-growth period	Long-term growth rate
Stable and mature	0 years	3%
Moderate growth, with reasonable prospects for additional products or customers	5 years	5%
High-growth company in a dynamic industry characterized by emerging technology	10 years	7%

***Author’s Note: It should be pointed out that one’s cost of capital estimate would depend in reality on capital structure (Step 4). For educational purposes, a 14% WACC is to be applied in this assignment.*

Step 8 Example:

Valuation Analysis

Based on Random Draw B, Blue Line Brewery's business is steady but with some earnings variability. We have a few competitors, but the market is not saturated. Unfortunately, barriers to entry are relatively low and the craft brewery market is viewed by many as somewhat faddish. We, the owner and head brewer, have agreed to sign three-year, non-compete contracts to offer a level of risk protection for the prospective buyer. Therefore, we assumed a 15% EBITDA growth rate (Random Draw B).

The free cash flows for Years 3 – 7 are shown below and included an adjustment for growth in NOWC and growth in annual CAPEX investments. The NOWC and CAPEX adjustments grew over time to reflect the 15% annual growth in EBITDA. In addition, the terminal value in Year 7 is \$10,847K with a 14% weighted cost of capital assumption and a 5% long term growth assumption.

The cash flows were discounted back to Year 3 to yield an overall NPV of \$9,144K. The terminal value contributes \$6,422K to the overall NPV, and the free cash flow from operations contributes \$2,722K.

Prospective buyers may be reluctant to accept the \$9.1M valuation given low barriers to entry and the relatively low capital investments required for a brewery startup. The terminal value is the largest contributor to the valuation, so the prospective buyer may challenge the validity of the terminal value's contribution to a fair market value. If the assumption for business growth rate is changed to 0%, then the terminal value contribution to the overall NPV would be \$3.9M with an overall NPV of \$6.6M. Our brand loyalty is strong, and the forecasted craft beer market strength is also strong. Therefore, we're committed to retaining ownership of the brewery if we do not receive a competitive offer.

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Citations for Step Responses Example Provided

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EBITDA Growth Rate	15%						
Year 3 EBITDA from Step 7	\$ 803,085						
Weighted Cost of Capital	14%						
Long Term Growth Rate	5%						
Annual NOWC and CAPEX Reinvestment Growth Rate (Applied to Years 4 - 7)	10%	of EBITDA from previous year					

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7
EBITDA with 15% Annual Growth			\$ 803,085	\$ 923,547	\$1,062,079	\$1,221,391	\$ 1,404,600
less Depreciation/Amortization			\$ (66,964)	\$ (66,964)	\$ (66,964)	\$ (66,964)	\$ (66,964)
EBIT			\$ 736,120	\$ 856,583	\$ 995,115	\$1,154,427	\$ 1,337,636
1 - tax rate			\$ 0.75	\$ 0.75	\$ 0.75	\$ 0.75	\$ 0.75
NOPAT = EBIT * (1-tax rate)			\$ 552,090	\$ 642,437	\$ 746,336	\$ 865,820	\$ 1,003,227
add back Depreciation/Amortization			\$ 66,964	\$ 66,964	\$ 66,964	\$ 66,964	\$ 66,964
Operating Cash Flow = NOPAT + Non-Cash items			\$ 619,055	\$ 709,402	\$ 813,301	\$ 932,785	\$ 1,070,191
Less Growth in NOWC and CAPEX Reinvestment			\$ (80,308)	\$ (92,355)	\$ (106,208)	\$ (122,139)	\$ (140,460)
Free Cash Flow			\$ 538,746	\$ 617,047	\$ 707,093	\$ 810,645	\$ 929,731
Terminal Value in Year 7							\$10,846,863
Subtotal			\$ 538,746	\$ 617,047	\$ 707,093	\$ 810,645	\$11,776,595
Overall NPV			\$ 9,143,952				

Year 3 - Income Based Assessment of Future Free Cash Flows

Free Cash Flow Contribution to Overall NPV	\$ 2,721,738						
Terminal Value Contribution to Overall NPV	\$ 6,422,214						
Overall NPV	\$ 9,143,952						

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