

NICHE-SEARCH

WORKSHEET 6 OF 9

Expansion Decision BEP — Fixed vs Variable Alternative

Use before committing to any new permanent fixed cost: a lease, a hire, a machine installment. The worksheet forces the comparison the business plan rarely shows.



Complementary worksheet for
Break-Even Analysis Handbook
by Ibrahim Anwar

What This Is For

Every new permanent fixed cost raises BEP immediately, before a single additional unit is sold. This worksheet makes that rise visible as a concrete number — in units per month and in months of historical growth rate needed to cover it. It also calculates the alternative: what if the same operational need were met with a variable-cost approach instead?

Most expansion business plans show revenue projections but not the BEP increase. This worksheet restores the missing calculation. It applies to any fixed-vs-variable decision: own warehouse vs. volume-based warehousing, permanent hire vs. contract labor, machine installment vs. outsourced production. In every case, the same ten-row table produces a crossover volume — the number of units per month at which both approaches cost the same — and places the operator's current volume on one side of it.

Benefits

What you get when you actually run this worksheet on a real situation:

- Calculates the BEP increase from a new fixed cost commitment before the commitment is made — not after.
- Produces the crossover volume at which fixed and variable approaches reach equal total cost, making the break-even between the two strategies concrete.
- Translates BEP increase into months of historical growth needed to cover it — the most operational way to evaluate whether the timing is viable.
- Protects against expansion decisions driven by capacity optimism rather than cost analysis.
- Generates a document the operator can present to a bank or investor: not a projection, a before-and-after BEP calculation grounded in current figures.

Framework To Use

— Fixed-vs-Variable Crossover

At low volume, variable cost is cheaper per unit. At high volume, fixed cost is cheaper. The crossover is where they meet. Your current volume tells you which side you are on.

| =

How To Use

Follow these steps in order. Each one builds on the previous.

- 1 Step 1: Write the new monthly fixed cost in the fixed-cost scenario column. This is the actual contracted amount — installment, lease, or salary plus benefits. Do not estimate; use the figure from the quote or contract draft.
- 2 Step 2: In the variable-cost alternative column, write the per-unit cost of the variable option (outsourced production rate, per-pallet storage fee, per-hour contract rate). If the variable alternative has a setup fee, amortize it over 12 months and add to fixed costs.
- 3 Step 3: Calculate CM per unit after each change. Fixed-cost scenario: $CM = \text{Selling Price} - \text{existing variable cost per unit (unchanged)}$. Variable-cost scenario: $CM = \text{Selling Price} - (\text{existing variable cost} + \text{new variable cost per unit})$.
- 4 Step 4: Calculate total fixed costs for each scenario: current fixed costs plus the new monthly amount (fixed scenario) or current fixed costs unchanged (variable scenario).
- 5 Step 5: $BEP \text{ Units} = \text{Total Fixed Costs} \div CM \text{ per unit for each scenario}$.
- 6 Step 6: $BEP \text{ increase vs current BEP} = \text{new BEP Units} - \text{current BEP Units}$. Fill both scenario columns.
- 7 Step 7: Using your historical average monthly volume growth (units per month added over the past 12–24 months), estimate how many months before the business adds enough volume to cover the BEP increase.
- 8 Step 8: Crossover volume — where both scenarios have equal total monthly cost. Set fixed-cost scenario total cost equal to variable-cost scenario total cost and solve for units: $Crossover = \text{New Fixed Cost} \div \text{New Variable Cost per unit (the difference)}$.
- 9 Step 9: Write your current average monthly volume. Is it above or below the crossover?
- 10 Step 10: Write your decision and the single most important condition that would change it.

Example Use

A snack food manufacturer is considering a new packaging machine at \$937/month installment, which produces packaging at \$0.25/unit fixed-production cost. The alternative: contract packaging at \$0.62/unit variable cost, no new fixed cost. Selling price \$1.56/unit. Current variable cost \$0.94/unit. Current fixed costs \$1,875/month. Current volume 1,500 units/month. Historical growth: 50 units/month.

Fixed-cost scenario:

New fixed cost: +\$937/month → total fixed costs \$2,812/month.

Variable cost per unit unchanged: \$0.94 (packaging is now in fixed cost).

CM per unit: $\$1.56 - \$0.94 = \$0.62$.

BEP = $\$2,812 \div \$0.62 = 4,535$ units/month.

BEP increase: $4,535 - 2,419$ (current BEP) = +2,116 units.

Variable-cost scenario:

No new fixed cost: total fixed costs remain \$1,875/month.

New variable cost per unit: $\$0.94 + \$0.62 = \$1.56$. Wait — that's the entire selling price. CM = \$0.

Recalculate: contract packaging at \$0.62 is the full unit cost of the service, added to existing variable costs.

If existing VC is \$0.94 and contract packaging adds \$0.31/unit: VC = \$1.25, CM = \$0.31.

BEP = $\$1,875 \div \$0.31 = 6,048$ units/month. Higher than the fixed-cost BEP.

At current volume of 1,500 units: fixed-cost scenario BEP (4,535) requires 3,035 more units. At 50 units/month growth, that takes 61 months. The variable-cost BEP (6,048) requires 4,548 more units — 91 months. Both are too long given cash reserves.

Decision: neither path is viable at current growth rate. The operator needs to find a volume source before committing to either option — or evaluate whether a leased-time arrangement on an existing machine reduces the fixed cost below the \$937 threshold.

The Worksheet

Tear this out, copy it onto a fresh sheet, or fill it in directly.

Expansion Decision BEP — Fixed vs Variable Alternative

Use before committing to any new permanent fixed cost: a lease, a hire, a machine installment. The worksheet forces the comparison the business plan rarely shows.

ITEM	FIXED-COST SCENARIO	VARIABLE-COST ALTERNATIVE	DIFFERENCE
New monthly fixed cost added (\$)		\$0 (variable replaces it)	
New variable cost per unit added (\$)	\$0		
CM per unit after change (\$)			
Total fixed costs after change (\$)			
New BEP Units (Fixed ÷ New CM)			
New BEP Revenue (\$)			
BEP increase vs current BEP (units)			
Months to cover BEP increase at avg monthly growth			
Total cost per unit at avg volume — this scenario (\$)			
Crossover volume (units/month) where both scenarios cost equally			

Reflection Prompts

After filling in the worksheet on the previous page, work through these.

1. If the fixed-cost scenario produces a BEP increase that takes more than 12 months to cover at historical growth rates, what conditions would need to be true for the timeline to shorten — and how probable are those conditions?
-

2. At what monthly volume do total costs become equal between the fixed and variable scenarios? Below that crossover volume, which scenario costs less per unit?
-

3. If the variable-cost alternative were used, and volume grew to match the projected increase, how much would total variable cost diverge from the fixed-cost scenario? Is the per-unit premium worth the lower BEP risk?
-

Tips and Traps

TIPS

- Use actual historical growth rate — units added per month averaged over the past 12–24 months — not a projected or target growth rate. The historical figure reflects what the business has actually been able to achieve; projections reflect what the operator hopes will happen.
- Run the crossover calculation for any volume level, not just current volume. A seasonal business may be above crossover in peak months and below it in slow months — that pattern changes which scenario is safer.
- If neither scenario produces a viable BEP timeline, that is a result, not a failure of the worksheet. It means the expansion decision needs a volume source the business does not yet have — a signed new customer, a confirmed new channel, or a credible promotional plan with historical precedent.

TRAPS

- Treating the variable-cost alternative as inferior because it has a higher per-unit cost at scale. At current volume, which is on which side of the crossover is the relevant question. Per-unit cost at scale is only relevant if reaching that scale is already confirmed.
- Forgetting that a variable-cost alternative that succeeds at scale will eventually cost more than the fixed-cost scenario. If the business grows past the crossover volume, the fixed-cost option becomes the cheaper one — plan the switch point before starting.
- Running only one of the two scenarios and calling it complete. The value of this worksheet is the comparison. One scenario alone produces a BEP number. Two scenarios produce a decision.

Appendixes

Appendix A – Crossover Volume Formula

The crossover volume is the number of units per month at which the total monthly cost under both scenarios is identical.

Setup:

FC_{fixed} = Total fixed costs under the fixed-cost scenario
 FC_{var} = Total fixed costs under the variable-cost scenario (unchanged)
 VC_{fixed} = Variable cost per unit under the fixed-cost scenario
 VC_{var} = Variable cost per unit under the variable-cost scenario

At crossover:

$FC_{fixed} + (VC_{fixed} \times Q) = FC_{var} + (VC_{var} \times Q)$
 $FC_{fixed} - FC_{var} = (VC_{var} - VC_{fixed}) \times Q$
 $Q_{crossover} = (FC_{fixed} - FC_{var}) \div (VC_{var} - VC_{fixed})$

Notes:

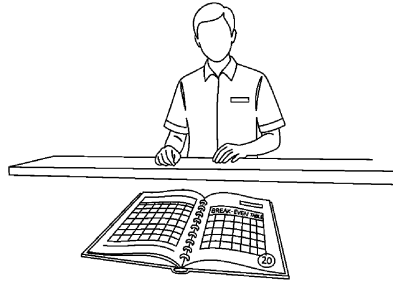
- Denominator must be positive: variable-cost alternative must have a higher per-unit cost than fixed-cost alternative for the crossover to exist. If $VC_{var} < VC_{fixed}$, variable is always cheaper per unit AND has lower fixed costs – take it without further analysis.
- If $Q_{crossover}$ is below current volume, the fixed-cost option is already cheaper per unit. If above current volume, the variable option is currently cheaper.

Example (from worked scenario):

$FC_{fixed} = \$2,812$, $FC_{var} = \$1,875$
 $VC_{fixed} = \$0.94$ (packaging now in fixed cost, no new VC)
 $VC_{var} = \$0.94 + \$0.31 = \$1.25$

$Q = (\$2,812 - \$1,875) \div (\$1.25 - \$0.94) = \$937 \div \$0.31 = 3,023$ units/month

Current volume 1,500 is below 3,023 → variable-cost option is currently cheaper per unit. Fixed-cost option becomes cheaper only above 3,023 units/month.



WHERE THIS WORKSHEET COMES FROM

Break-Even Analysis Handbook

Calculate How Many Units Must Sell Before This Business Turns a Profit

by Ibrahim Anwar

This worksheet is one of nine in the *Break-Even Analysis Handbook* companion worksheet pack. The full pack is grouped into three categories: high-volume worksheets you can run weekly, niche-search worksheets for rare but high-value situations, and specific-case worksheets that walk you through a single concrete scenario.

Every framework, decision filter, and figure used in these worksheets is drawn from the chapters of the source book. The book sets the diagnosis, the worksheets give you the form to act on it.

Available on Google Play Books

play.google.com/store/books

PT Hibrkraft Kreasi Indonesia · Cileungsi, Bogor · hibranwar.com