

Long-Run Expansion Path Explained



What is true about the long-run expansion path?
(Select each correct answer.)

☒ It intersects a series of tangency points between isocost lines and isoquant lines

☐ It lies tangent to a series of isocost lines

☒ It is linear if the MRTS is linear

☒ It indicates the least costly input combination for every level of long-run output



Explanation

As can be seen in Figures 9-5, the long-run expansion path intersects a series of tangency points between isocost lines and isoquant lines, because those lines represent the cost-minimizing points at each level of quantity produced. It is never tangent to any isocost lines; rather it intersects them. As pointed out in lecture, the long-run expansion path is linear if the MRTS is linear.

You are an expert in microeconomics.

I have a problem with the solution as shown in the picture.

However, I am still unfamiliar with some concepts and terms.

Please help to re-explain it in beginner-friendly tone and include some humor.



Let's tackle this *long-run expansion path* thing step-by-step! I promise, by the end, you won't feel like microeconomics is plotting against you. Let's break it down.

The Basics

Imagine you're a boss of a factory, and you're trying to figure out the **cheapest way** to produce different amounts of goods (output) in the *long run*. Now, in the long run:

- You can change **both inputs** (like labor and capital). No one is stuck with a broken machine or an overworked team forever.
- Your goal? Find the **cost-minimizing combinations** of inputs to produce any given output. Simple, right?

Key Terms You See in the Solution

1. Isoquant Lines:

These are like your "output goal" maps.

- Each isoquant shows all possible combinations of inputs (like labor and capital) that produce the *same amount of output*.
- Example: "I want to produce 10 sandwiches! I can use more workers and fewer machines, or fewer workers and more machines."

2. Isocost Lines:

These are your "budget" lines.

- They represent all the input combinations you can *afford* given a specific total cost.
- Example: "If I have \$100, I can hire 5 workers and 2 machines, or 3 workers and 4 machines—same cost, different combo!"

3. Tangency Point:

This is where the magic happens! A tangency point is where your isoquant (output goal) and isocost line (budget) **just kiss each other**—like two friends meeting for a perfect hug.

- At this point, you're producing a specific amount of output at the **minimum cost**.

What is the Long-Run Expansion Path?

Picture this:

You're increasing production levels—like going from 10 sandwiches to 20, 50, or even 1,000 sandwiches.

- At **each level of output**, you find the tangency points (optimal input combo = lowest cost).
- The **long-run expansion path** is simply the line that **connects all these tangency points**! It's like a road you follow to minimize costs as you scale up production.

Why the Solution Says What It Says

1. "It intersects a series of tangency points between isocost lines and isoquant lines"

✅ **Correct!**

Think of it as plotting your lowest-cost production choices on a graph. The expansion path "collects" all those points like a treasure hunt.

2. "It lies tangent to a series of isocost lines"

❌ **Wrong!**

The long-run expansion path doesn't "lie tangent" to the isocost lines. It's not trying to date them—just **intersect** at the tangency points. Isocost lines are like your "cost constraints," and the expansion path hops from one constraint to the next.

3. "It is linear if the MRTS is linear"

✅ **Correct!**

MRTS (Marginal Rate of Technical Substitution) measures how much you can swap labor for capital while keeping output constant. If the MRTS behaves nicely and is linear (constant slope), the expansion path will also be a straight line.

- Example: If swapping 1 worker for 1 machine always works, the path will look like a ruler—straight and clean.

4. "It indicates the least costly input combination for every level of long-run output"

✅ **Correct!**

Yes! This is the whole point of the long-run expansion path—it's like a guide that whispers, "Here's the cheapest combo of inputs for *this* output level."

A Quick Analogy (For Fun!)

Imagine you're on a diet (ugh), and you want to minimize **calories** while eating enough food to feel full:

- Isoquant = all the food combos that keep you *satisfied* (same output = full stomach).
- Isocost = your calorie budget line.
- The tangency points = meals that fill you up with the *fewest calories*.
- The long-run expansion path = the journey of finding the perfect meals as you go from a light snack to a full buffet!

TL;DR

The long-run expansion path is like a cost-saving GPS for a factory boss. It intersects tangency points where you achieve cost efficiency, and it'll look like a straight road *only if* the MRTS plays fair (linear).

Does this make more sense now? 😊

Is this conversation helpful so far?