

Factor Markets

by Sophia Tutorial



WHAT'S COVERED

This tutorial will cover factors of production, by identifying what they are, as well as aspects of intermediate, final, capital-intensive, and labor-intensive goods.

Our discussion breaks down as follows:

1. Final vs. Intermediate Goods
2. Factors of Production
 - a. Technology
3. Complementary vs. Substitute Resources
 - a. Complementary Resources
 - b. Substitute Resources
4. Choice of Technology
 - a. Short Run vs. Long Run
5. Economies and Diseconomies of Scale

1. Final vs. Intermediate Goods

There is an important distinction to be made between final and intermediate goods.

Final goods are simply defined as products ultimately produced, whereas **intermediate goods** are products or services used to generate other goods.

If you buy a new car, for example, that car is a final good; there is a final selling price for it.

However, the car company had to purchase many items to put into that car, such as the tires. Anything that the car manufacturer purchased that is included in the final selling price, like the tires, are intermediate goods.

Now, if you buy tires for your three-year-old car because it needs new tires, those tires would be considered to be a final good.

A new house is a final good, but similar to the car example, anything that the contractor bought to install in that new house that is included in the final selling price, such as the windows, are intermediate goods.

Lastly, consider a painting that you purchase to hang on the wall in your home. The painting is a final good. However, the paint and paintbrushes purchased by the artist to make the painting are intermediate goods.

Final Goods	Intermediate Goods
New Automobiles	Tires on New Automobiles (Original) Car company used the tires to make the car and it is included in the final selling price.
New Houses	Windows in a New House The contractor paid a window company for windows to install in the house.
Paintings	Paint/Paintbrushes The artist purchased the paintbrushes to produce the paintings.



TERMS TO KNOW

Final Good

Products ultimately produced.

Intermediate Good

Products or services used to generate other goods.

2. Factors of Production

Without the **factors of production**, businesses would not be able to produce anything. Factors of production are resources--defined as land, labor, and capital--necessary to produce output.

- **Land:** A factor of production that occurs naturally in the form of real estate or organic assets. Land itself is included in this category, as most companies must buy land to have a place to do business. Land also includes anything that comes *from* the land, such as wildlife and **natural resources** like fertile soil, minerals, timber, and water. Natural resources are the organic material found in its natural habitat--basically anything that is not man-made.
- **Labor:** Human service that contributes to the creation or distribution of goods or services. The entire workforce, meaning anyone producing either a final good or a service, is considered labor. Without labor, final goods and services would not get produced.



EXAMPLE Examples of labor would include doctors and nurses, teachers, hairstylists, and cashiers.

- **Capital:** Material assets in either the form of money or machinery used as a factor of production.



HINT

Think of capital as anything that has already been produced but will be used to help produce other things.



EXAMPLE Buildings, computers, and roads are all examples of capital.

2a. Technology

Now, for anyone that relies on a computer to produce, that computer is considered capital, which brings us to an interesting point about **technology**.

Technology refers to specialized production techniques. Technology can help companies to more efficiently utilize the other factors of production.

IN CONTEXT

A classic example of the impact of technology is the invention of the cotton gin. You may have learned about Eli Whitney and the cotton gin in a history class.

Prior to the cotton gin, the harvesting of cotton was very labor-intensive; therefore, labor was the biggest factor of production being used.

This new technology not only effected a significant decrease in labor intensity, but it led to a huge increase in the quantity of cotton being harvested.

Even though there was an upfront cost of purchasing this technology, the cost savings was quickly realized due to the increase in production and decrease in labor intensity—in essence, helping those involved to more efficiently use the other factors of production.



TERMS TO KNOW

Factors of Production

Resources defined as land, labor, and capital that are necessary to produce output

Land

A factor of production that occurs naturally in the form of real estate or organic assets

Natural Resources

Organic material found in its natural habitat

Labor

Human service that contributes to the creation or distribution of goods or services

Capital

Material assets in the form of money or machinery used as a factor of production

Technology

Specialized production techniques

3. Complementary vs. Substitute Resources

When looking at resources, do the factors of production work together or are they simply substituted for one another? In reality, it depends on perception.

3a. Complementary Resources

One perspective is that by adding capital, labor is more productive. You can have all the buildings and machines (capital) that you want, but they won't be useful in most cases without people (labor) who know how to operate them or utilize the space.

This means that the two resources--capital and labor--go together and are considered to be complementary resources.

IN CONTEXT

Suppose you own a sandwich shop, and people are lining up day after day to purchase your sandwiches. In fact, you can't meet the demand, meaning that the demand is greater than your shop's ability to produce.

So, in this case, what can you do? Well, in the short run, you could certainly hire more workers, but if those workers are getting in one another's way because you don't have enough capital, then they are not going to be very efficient.

On the other hand, if you purchase a new grill, that represents capital which will make your labor--your existing workers--more efficient, because they won't get in each other's way crowding around one grill.

In this case, capital and labor would work together as complementary resources.

3b. Substitute Resources

Another perspective is to look at resources as being substitutes of one another.

If labor becomes expensive--because as minimum wage goes up, this tends to happen--firms can adopt labor-saving technologies, especially in the long run.

They can start to substitute capital for labor.

➞ **EXAMPLE** For instance, automated assembly lines is an example of substituting capital for labor.

If capital is too expensive, firms can also use labor-intensive techniques to produce.

4. Choice of Technology

A key idea is that most things can be produced in different ways, and the bottom line is that the profit-maximizing firm will choose the form of technology that minimizes cost.

➞ **EXAMPLE** For example, one grocery store may take a labor-intensive approach and hire a lot of cashiers to check customers out, while another grocery store may move towards a more capital-intensive approach and adopt self-checkout technology, replacing some of the labor with capital. Again, the profit-

maximizing firm will choose the option that minimizes cost for them in their specific situation.

We also need to consider that despite the need or desire to minimize cost, there can be a psychological component involved, which is an attachment to the labor force.

A seasoned management team may receive higher salaries, and if you are the owner of the company, you may question if they are worth the money. You could, in theory, replace them with younger people who won't cost as much, or even replace some of your staff with capital and reduce your labor costs.

However, if a crisis were to occur in your company, who would you trust to help the company recover? There can definitely be an attachment to your labor force, as well as a benefit in holding onto them. Even if it is not necessarily minimizing cost right now, it could in the long run.

4a. Short Run vs. Long Run

In the short run, factors of production (land, labor, and capital) affect production. A business can hire more or less labor depending on how the company is doing. They can utilize all of their land and capital, or choose not to.

In the long run, more options arise, and factors of production vastly affect long-run production. A company can grow and expand, raising more capital to adopt new production techniques using technology.

In either case, factors of production are going to affect a business in the short run and the long run, just in slightly different ways.

5. Economies and Diseconomies of Scale

Now, economies of scale is a long-run issue. As mentioned, in the short run, often companies do the best they can with what they have. In the long run, however, they can grow their company.

Many companies find that it is actually economical to grow their company. As they increase the size of their company, they start to lower their average cost, because they can spread out any upfront or fixed costs.

This is known as economies of scale, also called increasing returns to scale. Basically, "scale" refers to how big a company is getting.

Other companies, though, have found that as they grow, it actually leads to inefficiency or waste, and their overall cost structure begins to rise.

This is a situation in which there are decreasing returns to scale, or what we call diseconomies of scale. In this case, it would not be economical to grow a company in the long run any further.



SUMMARY

Today we learned about **final vs. intermediate goods**, noting that a good rule of thumb to determine the difference between final and intermediate goods is that final goods are simply defined as products ultimately produced, whereas intermediate goods are products or services used to generate other goods. We learned that **factors of production** are resources, defined as land, labor, and capital,

necessary to produce output. **Technology**, while it can refer to capital such as computers used to produce output, also refers to specialized production techniques, which can help companies to more efficiently utilize the other factors of production.

We learned about the difference between **complementary vs. substitute resources**, noting that resources can either work together (complementary) or be substitutes for one another. Most things can be produced in different ways, and the bottom line is that the profit-maximizing firm will choose the form of technology that minimizes cost--although there can be a psychological attachment to the labor force. The **choice of technology** can be impacted by capital-intensive approaches vs. labor-intensive approaches, as well as **short-run vs. long-run** outlooks. Lastly, we learned that **economies of scale** occur when a company grows and is able to reduce costs by spreading out fixed costs, while **diseconomies of scale** happen when the increased company size leads to inefficiency and waste, and increasing costs.

Source: this work is adapted from sophia author kate eskra.



TERMS TO KNOW

Capital

Material assets in the form of money or machinery used as a factor of production.

Factors of Production

Resources defined as land, labor, and capital that are necessary to produce output.

Final Goods

Products ultimately produced.

Intermediate Goods

Products or services used to generate other goods.

Labor

Human service that contributes to the creation or distribution of goods or services.

Land

A factor of production that occurs naturally in the form of real estate or organic assets.

Natural Resources

Organic material found in its natural habitat.

Technology

Specialized production techniques.