Resource Allocation for Firms

by Sophia Tutorial

WHAT'S COVERED

This tutorial will cover resource allocation for firms, discussing the choices that all firms need to make regarding resources, or factors of production.

Our discussion breaks down as follows:

1. Factors of Production
   a. Land
   b. Labor
   c. Capital
2. Production Decisions: Cost Minimization/Profit Maximization
3. Constraints
4. Short Run vs. Long Run

1. Factors of Production

Let's begin our discussion by getting into the mindset of a business. Now, if you are thinking like a business, you must decide the following:

- How much should we produce?
- How should we produce it?
- How much land, labor, and capital do we need to buy?

In order to produce, businesses must purchase resources, also known as**factors of production** by economists. Factors of production are the resources defined as land, labor, and capital that are necessary to produce output for the sake of profit.

1a. Land

Land is a factor of production that occurs naturally in the form of real estate or organic assets.
Clearly, land itself is included in this category. Most businesses have to purchase at least a little bit of land in order to have a place to do their business.

However, land also includes anything that comes *from* the land, such as wildlife, fertile soil, minerals, and timber.

HINT

Land as a factor of production includes anything that is a natural resource and not man-made.

1b. Labor

Labor is the next factor of production, and it is human service that contributes to the creation or distribution of goods or services; it represents the entire workforce.

> EXAMPLE Examples of people laboring would include doctors and nurses, teachers, hairstylists, and cashiers.

A person can be producing either a physical good or providing a service and be considered labor.

1c. Capital

Capital refers to material assets in the form of either 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 Example of capital are buildings, computers, and roads.

THINK ABOUT IT

Would you be able to produce without the use of your computer? Any number of professions--including a teacher--would not be able to labor without the use of a computer. Therefore, a computer would be considered as capital. It's something that has already been produced and is used to help produce output.

TERMS TO KNOW

Factors of Production
Resources defined as land, labor, and capital that are necessary to produce output for the sake of profit

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

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

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2. Production Decisions: Cost Minimization/Profit Maximization

So, how do firms decide how much land, labor, and capital they need to purchase? Well, it involves a couple of factors.

The first factor is that they have to figure out how much they are producing. This decision might change vastly if they are producing a lot versus a small amount.

In addition, the price or cost of each factor of production or resource plays a major role.

The goal of any business is **cost minimization**, or selecting the output strategy that incurs the least amount of cost, that will lead a business to **profit maximization**, which is the procedure of determining quantity and cost that yields the greatest profit.

Now, sometimes it is helpful to compare firms to consumers. Whereas we as consumers seek to maximize our utility or our satisfaction when making purchases, firms seek to maximize their profit.

Consumers base their buying decisions on individual preferences, while firms base their decisions on the opportunity costs.

HINT

Remember, opportunity cost represents what is being sacrificed or given up in terms of the factors of production--the opportunity cost of land, labor, and capital.

Consumers Maximize Utility	Firms Maximize Profit
Based on individual preferences	Based on opportunity costs of land, labor, and capital

TERMS TO KNOW

Cost Minimization
Output strategy that incurs the least amount of cost

Profit Maximization
Procedure of determining quantity and cost that yields the greatest profit

3. Constraints

We all face **constraints**--and businesses are no exception. A constraint is an element that interrupts production of a firm or consumption by individuals.

In this tutorial, we are focusing on the production of the firm, so whereas consumers are constrained by time and income, businesses are additionally constrained by their factors of production.

Land, labor, and capital are definitely limited in the world, and are therefore constraints.

TERM TO KNOW

Constraints
An element that interrupts production of a firm or consumption by individuals

4. Short Run vs. Long Run

Let's begin our discussion about the short run versus the long run with an example.

> Several Christmas seasons ago, a child's toy called Tickle Me Elmo was all the rage. In fact, mothers and fathers could not get their hands on this doll for their kids. Business was certainly booming!
>
> If you were the owner of that business, wouldn't you want to produce more in order to make a greater profit? Clearly, consumers everywhere were willing to pay outrageous amounts of money for this doll.
>
> Therefore, as the business owner, you'd want to produce more so that you can make that profit. However, firms are constrained by their resources, and it varies in the short run versus the long run.

4a. Short Run

As that business owner, what can you do *right now*, in the short run? Well, you could hire more workers and buy more materials to make the dolls.
However, in the short run, you are limited. You might not have enough workspace or enough capital, like machines.

Therefore, you can hire all the workers you want, and buy all the material you want, but your workers will likely get in one another's way, and won't have enough machines to work on. It won't be enough to justify the additional workers that you hired.

Certainly, there is some wiggle room in the short run, and you will simply optimize your capabilities and do the best with what you have.

However, there is something called **short-run constraints**, which is a temporary period of time with least control over constraints when at least one element is fixed.

> EXAMPLE For example, you can't simply terminate your lease and buy a new building in the short run, because you have a contract or lease agreement for a designated period of time. This is what we mean by a fixed element.

4b. Long Run

Moving into the long run, let's assume that business is still booming for Tickle Me Elmo. You as the business owner can now do far more, because you have more time.

HINT

Note, in this example, by the long run, we mean within a year. This is not always the amount of time specified by the long run. The long run is simply a period of time in which a business's opportunities expand, where elements are no longer fixed and instead become variable, or able to change.

In this example, though, within a year, you can:

- Rent or buy more space
- Purchase more machines
- Change production techniques or capacity
- Take advantage of advances or different methods

Since you have the time to investigate different opportunities and raise the capital needed for them, the possibilities are endless in the long run.

Here is a brief summary of short run versus long run.

Short Run	Long Run
At least one cost is fixed	All costs become variable
Example: Rent	Example: I can terminate my lease

BIG IDEA

In the short run, there is at least one fixed cost, and in the long run, all costs become variable.

Now, it is important to note that even though this is how we define short run versus long run, it is worth questioning if everything is actually variable in the long run.

In theory, the constraint of having a fixed cost disappears in the long run, for instance:

- You can terminate your lease or start a new one.
- You can sell your building and machinery or buy more.
- You can invest in new technology.

However, what you need to keep in mind is that the long run is really the sum of all of your short-run decisions. Therefore, in the short run, you have already optimized your production abilities each and every time.

THINK ABOUT IT

If the long run is the sum of all short-run decisions, do you think that everything is really variable in the long run? It's up to you to form your own opinion.

TERM TO KNOW

Short-Run Constraints
Temporary period of time with least control over constraints when at least one element is fixed

SUMMARY

Today we learned that the three **factors of production**, also known as resources or inputs, are **land**, **labor**, and **capital**. We learned that firms face resource **constraints**, which varies in the **short run vs. long run**. Remember, in the short run, there is at least one fixed cost, and in the long run, all costs become variable. Lastly, we learned that firms are always seeking to **minimize costs** in order to **maximize profit**.

Source: Adapted from Sophia instructor Kate Eskra.

TERMS TO KNOW

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

Constraints
An element that interrupts production of a firm or consumption by individuals.

Cost Minimization
Output strategy that incurs the least amount of cost.

Factors of Production
Resources defined as land, labor, and capital that are necessary to produce output for the sake of profit.

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.

Profit Maximization
Procedure of determining quantity and cost that yields the greatest profit.

Short-Run Constraints
Temporary period of time with least control over constraints when at least one element is fixed.