AOF Business Economics

Lesson 5

Factors of Production

Student Resources

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Student Resource 5.1

Reading: Factors of Production

AOF
Business Economics

Unit 2, Lesson 5

Factors of Production

The following presentation introduces students to the three factors of production—land, labor, and capital—using the running example of a lemonade stand. The presentation provides definitions and examples upon which to build a more solid understanding of these key concepts and how they interconnect with the related market force of entrepreneurship to build new products and services. The factors of production are addressed individually, and then analyzed within the larger framework of the market economy using what is known as the circular flow model.

Economics deals with the stuff we need to make other stuff

- Factors of production are the economic resources needed to produce goods and services
- Three factors of production: land, labor, and capital
  - Entrepreneurship ties these factors together into a productive enterprise
  - Each is limited in supply (scarcity)

The entrepreneur's job is to combine the other three factors of production to create new products and services

What are factors of production? At their most basic level, they are the ingredients that go into making a product or providing a service. The factors of production, plus the products and services bought as inputs to the production process, are the stuff needed to make other stuff. Almost nothing regularly consumed by humans, apart from air, is derived without using the factors of production. Instead, these products and services—Big Macs, skateboards, video games, and yes, lemonade—are all produced using people, machines, factories, and other products. The factors of production come in three forms: land, labor, and capital.

For economists, land is more than dirt

Land: all the natural resources found on or under the ground that are used to produce goods and services

- Water
- Forests
- Fish
- Iron
- Coal
- Oil
- Plants

Why wouldn't a parking lot be considered a land factor of production?

The first factor of production is land. Consider again the lemonade stand example. The land that the lemonade stand occupies is obviously one input needed by the lemonade stand business—the lemonade stand has to be located somewhere.

What about the parking lot next to the lemonade stand? That's land, isn't it? Given the description of land as a factor of production, should we consider the parking lot something more? Yes, because other factors have been added to make it more valuable. Someone paved it, painted parking spots, installed meters, and maybe installed some lights and a fence as well. All of these additions have added value to what was once a simple plot of land.

Then there are the ingredients that the lemonade stand business uses to make lemonade. These ingredients include lemons, sugar, and water. The lemons, sugar, and water are factors purchased by the lemonade stand business as inputs. The lemons were grown on a farm; and the sugar was manufactured from sugarcane, also grown on a farm. On the farm, land is obviously a vital factor of production: you can't have a farm without land. In economics, though, the word "land" refers to more than just acres of soil. It also refers to the lemon trees used in growing the lemons, and the sugarcane plants used in growing the sugarcane that was used in making the sugar. The word *land*, the way economists use it, would also include the water used to make the lemonade. Indeed, any natural resource supplied by the planet (rather than produced by human activity) falls within the definition of land as a factor of production.

For economists, labor is more than elbow grease

Labor: all the human time, effort, and talent used to produce goods and services

- Garbage collectors
- Mechanics
- Heart surgeons
- Construction workers

Why would a heart surgeon and a construction worker fall under the labor factor of production category?

For many, the idea of labor as a factor of production conjures up images of someone wearing a hard hat swinging a pickaxe. And while that's accurate, it is not a complete picture. Labor as a factor of production covers all human efforts and talents that go into the production of a good or a service. So the famous actor going through his eighteenth take of a scene from his new movie is just as much a part of labor as is the worker jackhammering the sidewalk outside your window.

The labor factor of production, because it involves people, brings up some interesting behaviors. Among these are:

Substitution effect: The impact that substitutes for labor have on wages—for example, the effects of using a machine instead of a person to do a certain job.

Income effect: The inverse impact that increased wage rates per hour can sometime have on the number of hours work people work.

To answer the question on the slide, once you have the definition given as it is, it is easy to see that any human economic contribution to the value of a good or a service is categorized as labor.

For economists, capital is more than money

Capital: Resources made and used by people and kept to use in producing and distributing goods and services

- Tools
- Machinery
- Factories
- Offices
- Computers
- Cell phones
- Roads
- Airports

When a business buys a new machine in order to become more productive, it is called investing in physical capital. But it can also invest in human capital. What do you think that means?

In everyday conversation, most people use the word *capital* to mean money. Economists, however, look at capital more broadly, considering it to include all of the items made by labor and businesses that are then held by businesses for use in producing other goods and services. Examples include trucks used by a business to deliver the products they make, machines used in making the products, and software programs that may be used to control the machines, or to manage the business.

Money becomes the way economists measure how much these productive resources are worth.

Consider the question posed in the box. What does the term *human capital* mean? For a business, the term *human capital* refers to what's added (in terms of skills, for example) to the labor it uses to produce its goods and services in order to make that labor more productive. Just like a new machine that can perform a specific task more rapidly or efficiently, so can a person (labor) learn to do a job more efficiently. Investing in human capital therefore means adding skills and talents to labor to make them more efficient. This includes training, education, and increased experience.

For economists, it matters who gets the ball rolling

Entrepreneurship: the bringing together of all the factors using ingenuity, skill, vision, and a willingness to take the risks necessary for starting a new business enterprise

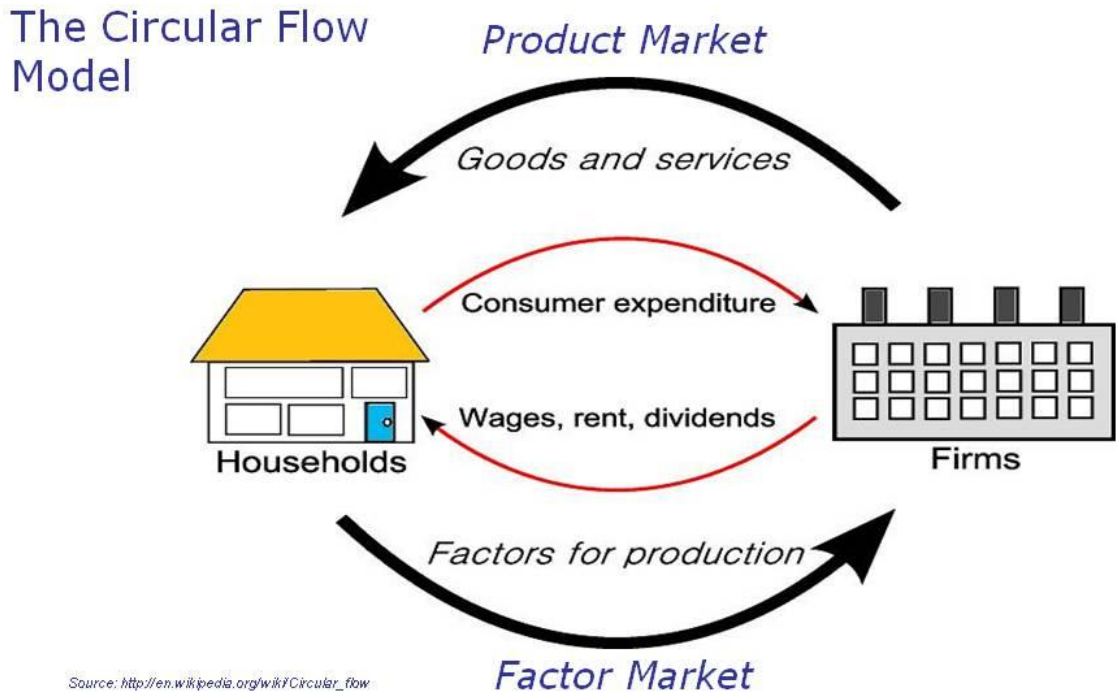
- Steve Jobs, Apple Computer
- Robert Johnson, BET
- Jerry Yang, Yahoo!

Can someone start a new business without taking a risk?

The role of entrepreneurship in economics is understood by all. However, its proper categorization remains a point of contention. Some economists consider entrepreneurship the fourth and final factor of production. Others consider land, labor, and capital to be the three factors of production, and entrepreneurship a “black box” into which the three are placed in order to become goods and services worthy of purchase. Looking at entrepreneurship in this way does not diminish its importance. It simply highlights even more how critical it is to the dynamic free market and free enterprise system.

Much like the labor factor of production, an entrepreneur (meaning either an individual or a business) uses its skills and talents to produce goods and services. Where entrepreneurs differ is in their ability to see new opportunities, their drive to bring together all of the needed factors of production that make a new product or service, and their willingness to take risks in order to exploit these opportunities. When we apply this to the lemonade stand example, the person selling the lemonade is acting entrepreneurially by trying to create a new market for lemonade (the local park) where one did not exist before by bringing together all of the necessary factors of production.

How these factors are interconnected is critical



How all these different factors of production and entrepreneurship are interconnected is one of the more important questions in economics. The circular flow model shows how all of these factors move between households (individuals) and firms (businesses). The model starts from the assumption that all factors of production are owned by households and are sold to firms in what is called the *factor market*.

- Households sell their labor in the form of wages.
- Households sell their land in the form of rent.
- Households sell their financial capital by making their savings available to businesses in exchange for interest or dividends.

In turn, firms take these factors of production and use them to make goods and services that they sell back to households in what is called the *product market*. Households use their wages, rents, interest, and dividends to buy these goods and services.

Because both the factor market and the product market are free markets, prices for goods and services and factors of production find their price equilibrium through the process of supply and demand. By *price equilibrium*, we mean a situation where the amount of a good that's offered for sale, and the amount that is bought, are more or less in balance (there's no big shortage or unsold surplus); and prices are reasonably stable as a result.

Student Resource 5.2

Worksheet: Factors of Production

*Student Name:*_____ *Date:*_____

Directions: Using the information in the first column along with what has been covered in the class so far, predict some of the products or services that each of the described countries produce given their factors of production. Then guess which country fits each description from the list of countries provided at the top of the worksheet. Once you have completed this, read Student Resource 5.3, Reading: Country Factors of Production Summaries, and fill in the column of actual goods produced. Make any corrections to the country names necessary.

• **Canada**	• **India**	• **Indonesia**
• **United Kingdom**	• **Argentina**	• **Democratic Republic of the Congo**
• **Japan**	• **Saudi Arabia**	• **Russia**

Country A

Factors of Production Available	Likely Goods Produced	Actual Goods Produced	Country Name
Land: This is a densely populated, mountainous, island country with few energy resources or raw materials and limited agriculture potential (less than 7% of the land is cultivated).	• _____ • _____ • _____	• _____ • _____ • _____	**Your Guess:**
Labor: This country has a highly paid, well-educated workforce.	• _____	• _____	
Capital: This is a technologically advanced country with a wide array of manufacturing and service industries, sound transportation, and excellent telecommunications.	• _____ • _____	• _____ • _____	**Actual Name:**

Country B

Factors of Production Available	Likely Goods Produced	Actual Goods Produced	Country Name
Land: This is the eighth largest country by land area in the world. The land is very diverse and ranges from rich plains to coastal areas and rugged mountain ranges. It has abundant natural resources and is one of the world's major agricultural producers.	• _____ • _____ • _____ • _____ • _____ • _____	• _____ • _____ • _____ • _____ • _____ • _____	**Your Guess:**
Labor: This country has a highly urbanized population with one of the highest literacy levels in the world.			
Capital: This is a country with a diverse industrial base and an agricultural sector that is focused on exporting. Its service and manufacturing industries are strong and it has a relatively advanced transportation system in place.			**Actual Name:**

Country C

Factors of Production Available	Likely Goods Produced	Actual Goods Produced	Country Name
Land: This country has a tropical climate with rainforests that occupy more than half of the country's total area. It is extremely rich with natural resources and is the world's largest producer of cobalt ore. It is also a major producer of copper and diamonds.	• _____ • _____ • _____ • _____ • _____	• _____ • _____ • _____ • _____ • _____	**Your Guess:**
Labor: There are over 250 ethnic groups and close to 700 languages and dialects spoken. Many children			

receive no education because parents are unable to pay the enrollment fees. There are excessive mortality rates due to famine, violence, and diseases.	• _____	• _____	
Capital: This is a country with immense economic resources and an amazing potential for wealth. However, war, violence, and corruption have instead dominated the country. It has inadequate telephone systems, and its road conditions are extremely poor.			**Actual Name:**

Student Resource 5.3

Reading: Country Factors of Production Summaries

Directions: Read the following short narratives and use the information to fill out the remaining columns on Student Resource 5.2, Worksheet: Factors of Production.

Country 1: Japan

Japan is one of the world's most advanced industrialized economies supported by a highly productive labor force, effective mastery of technology, and committed industrial leadership. Even though the country lacks natural resources, it has been able to develop a diverse and technologically sophisticated economy through trade with other countries. Among the many things that the economy produces are rice, sugar beets, vegetables, fruit, pork, poultry, dairy products, eggs, fish, machinery and equipment, consumer electronics, motor vehicles, semiconductors, and chemicals.

Country 2: Argentina

Argentina, once one of the richest countries in the world, benefits from an abundance of natural resources, a highly literate population, an export-oriented agricultural sector, and a diversified industrial base. However, it now ranks as only an upper-middle income country, despite the fact that it remains the one of the more economically developed countries in Latin America. Its economy produces primarily commodities such as sunflower seeds, lemons, soybeans, grapes, corn, tobacco, peanuts, tea, wheat, and livestock. It also produces car parts for export, but is otherwise dependent upon more technologically developed countries for key capital goods of the modern economy such as computers, machinery, telecommunications equipment, and transportation.

Country 3: Democratic Republic of the Congo

The Democratic Republic of the Congo (DRC) should be one of the richest countries in Africa. It holds vast natural resources, many of which are used in modern consumer technologies and are in high demand. However, the DRC has suffered from poor government, corruption, and civil war since its independence in 1960. As a result, the country has almost no navigable roads, electricity, or working telecommunications and has a workforce with only the most basic skills. As a result, it almost exclusively produces raw commodities such as diamonds, oil, cobalt, coffee, and copper.

Student Resource 5.4

Reading: Chocolate from Start to Finish

Most of us think of chocolate making as an **assembly-line process**—large machines plopping candies onto **conveyor belts** whizzing around a large factory. And while that is part of the story of the chocolate bar, it is but the final chapter in a much longer book. All chocolate starts from the **seed pod** of a tropical rainforest plant, the **cacao**. **Farmers harvest** the seed pod, scoop out the pulp-covered cacao seeds, and **dry them in the sun** before shipping them off to markets for sale to major chocolate makers. The process from tree to market requires great amounts of human labor, including farmers tending to the plants, **workers** harvesting each pod with machetes, and **laborers** drying and preparing the seeds for transport.

Once the seeds have arrived at the **chocolate-making factory**, they're converted into chocolate in a complex, multi-step process. **Seeds are sorted** according to type, cleaned, and then carefully weighed so they can eventually be blended according to **special formulas** created by each manufacturer. Next, the beans are roasted in **large rotating ovens** for anywhere from 30 minutes to 2 hours, depending upon the variety of seed.

After roasting, seeds are milled—crushed by **heavy steel discs**, generating enough friction and heat to liquefy them into a thick paste, called **chocolate liquor**. The liquor then goes through one of two separate processes, depending upon what it is used for in the final stage of manufacturing. Some of it is placed in huge **hydraulic presses** that squeeze out the **cocoa butter**. The remaining unpressed liquor is blended with condensed milk, **sugar**, and extra cocoa butter to form chocolate. This more refined chocolate is cooled and warmed repeatedly in a process called tempering. Tempered chocolate is then shipped in a liquid state to other food manufacturers that use the flavoring in cookies and ice cream, or to make chocolate bars.

The process of turning the tempered chocolate into the solid bar form that most of us know takes both man and machine. Hershey's Chocolate, for example, uses **automated machines** to pour the tempered chocolate into **molds** to make candy bars of either pure chocolate or bars mixed with **nuts or dried fruit**. The molds cool in **large refrigeration units** and then move to **wrapping and labeling machines**. After this, the bars are boxed and distributed to the final points of sale. In small-scale chocolatiers, machines are a critical part of the production process, but the **chocolatier** often remains hands on. In many cases, this includes **adding final design touches** and **hand-molding designer creations** for special events. With either operation, the goal is identical: to make the finished products that we find on the shelves of our local markets and in the display cases of our local chocolate shops.

Student Resource 5.5

Worksheet: Chocolate from Start to Finish

*Student Names:*_____ *Date:*_____

Directions: After reading Student Resource 5.6, Chocolate From Start to Finish, apply what you have learned in this lesson to properly categorize each bolded term (person, place, thing, or action) in its correct factor of production category—land, labor, capital, or some combination of all three. The boxes below present the bolded terms in their order of appearance in the reading. Be sure to think about the defining characteristics of each factor of production and how the person, place, thing, or action described in the reading fits those characteristics. Also, consider the category of entrepreneurship. Would you consider any of the people described here to be practicing entrepreneurship? Examples are provided for each factor.

Bolded Term	Factor of Production Category	Bolded Term	Factor of Production Category
assembly-line process	Labor/Capital	**heavy steel discs**	
conveyor belts		**hydraulic presses**	
seed pod		**large rotating ovens**	
cacao	Land	**hand-molding designer creations**	
farmers harvest		**automated machines**	
dry them in the sun		**molds**	
workers		**nuts or dried fruit**	
laborers		**large refrigeration units**	
chocolate-making factories	Capital	**wrapping and labeling machines**	
seeds are sorted		**chocolatier**	
special formulas		**adding final design touches**	Labor