This text covers material for a Principles of Microeconomics course. This course is, typically, taken in the Freshman year of college by all business majors.

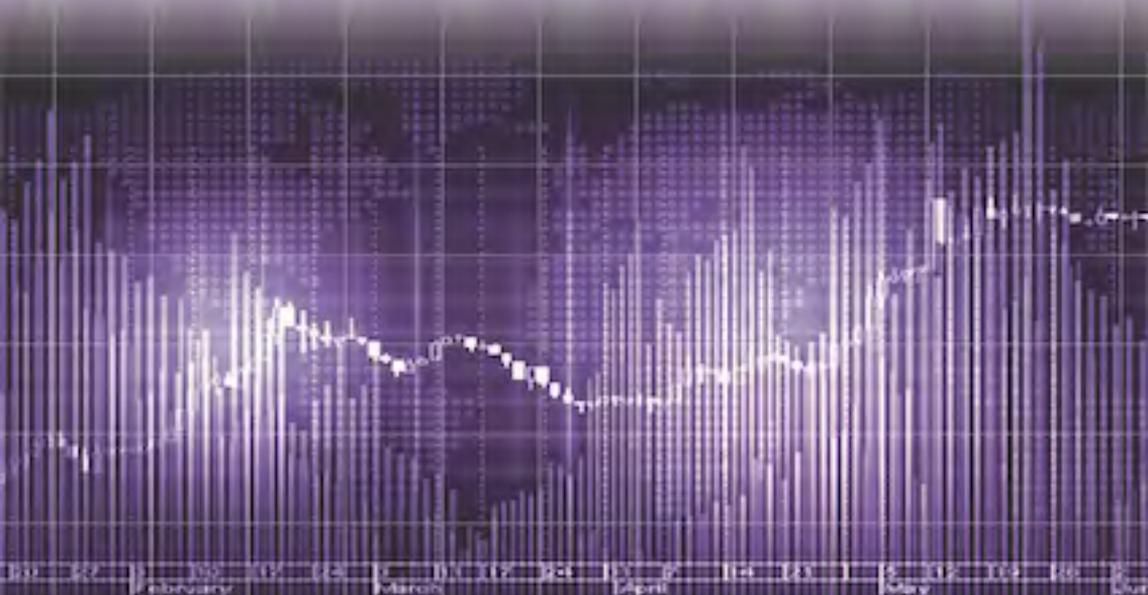# Principles of Microeconomics

by A.J. Cataldo II PhD CPA CMA CGMA

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PRINCIPLES

—— OF ——

MICROECONOMICS

ANTHONY JOSEPH CATALDO II

ABOUT THE AUTHOR

A.J. Cataldo has worked in public accounting, internal and government auditing (California Auditor General), chief financial officer/controller, and provided expert testimony in business litigation engagements involving GM, Ford, Chrysler, Toyota, Nissan and other automobile manufacturers, testifying in Nevada, California, Texas, and Arizona. His 10 books include 3 Elsevier Science, scholarly monographs, and some of his 200+ articles have appeared in *Journal of Accountancy, National Tax Journal, Research in Accounting Regulation, Journal of Forensic Accounting, Accounting Historians Journal*, and *Seeking Alpha*. The *Securities and Exchange Commission* has filed some of these publications in Court Proceedings. A very recent publication (2015) won a *Best Paper* award at a conference (2014). He has served as an external reviewer for promotion and tenure and/or dissertation candidates, both domestically and internationally (e.g., U.S., Malaysia and Australia). He continues to serve on editorial review boards for IMA association journals (and others) for 25+ years, the former, including *Management Accounting, Strategic Finance*, and *Management Accounting Quarterly,* (1990-) and the *ATA Journal of Legal Tax Research* (2010-). Presently, he teaches financial accounting, at all levels and cost accounting at the MBA level. Previously, he taught managerial and cost accounting, at all levels. He has also taught micro- and macro-economics, corporate finance, and business statistics courses and authored study guides on these and other business topics.

Additional information and other publications are available on **_LinkedIn_**, **_Google Scholar_**, **_Seeking Alpha_**, and **THE CANNABIS REPORT** for **_IHUB_**. Professor Cataldo is also the author of **_Introduction to Financial Accounting (2nd Edition)_**, **_Managerial Accounting (2nd Edition)_**, and **_Marijuana Stocks_**.

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Chapter 3
Scarcity & Choice

Learning Objectives

- Explain how we determine what gets produced.
- Describe how we determine how it is produced.
- Explain how we determine who gets what is produced.
- Describe the basic trade-offs illustrated by the production possibility frontier (PPF).
- Define opportunity cost.
- Describe how it is that Government as a referee, business regulator, and redistributor or wealth.

<u>Resources</u> are often classified into 3 categories:

1. Land,
2. Labor, and
3. Capital

We do not have an unlimited supply of any of the above resources. Resource scarcity represents a constraint that forces choices between two or more alternatives.

Scarcity & Limited Economic Resources, Choice & Opportunity Cost

A fundamental notion of economics is the reality that goods and services are not unlimited and are constrained by scarcity. Scarcity and limited resources require decision-making and choice.

Choice involves consideration of <u>opportunity cost</u>. The cost of choice or choosing one alternative or decision, in a world of scarce or limited resources, requires trade-offs in that the consumption of more of one good or service may require less consumption of an alternative good or service.

It is presumed preferable that opportunity cost and market price be aligned or connected. An open or market-based economy tends to achieve this objective.

Therefore, as the price level increases for a good or service that is becoming increasingly scarce, alternatives might be more likely to be considered. Stated alternatively, a well-functioning market is one where goods and services with a high opportunity cost will also have a high money cost and goods and services with a low opportunity cost will also have a low money cost.

The classic example used in texts and for illustration to students, is the opportunity cost of a college education. In choosing to attend college, if rational, you are anticipating that the highest valued alternative benefit forgone, lower wages or salaries under a condition of immediate employment, will be offset and exceeded, at some future point in time, by the increased earnings you generate from this loss of immediate income.

In economics, we assume that the decision-maker prefers to make the optimal decision when choosing between alternatives. This decision is made after both implicit and explicit considerations and comparisons have been made. Economists tend to use marginal analysis to examine the decision-making process of optimal choice or selections among alternatives.

Scarcity & Choice – Inputs, Outputs & the Production Possibilities Frontier

Finished goods and services or outputs require raw materials, labor and overhead or inputs. Inputs may have alternative uses, are scarce or limited, and, so, involve trade-offs. For example, the classic example is the trade-off between consumer goods and military goods, like butter or bullets, respectively.

The production possibility frontier provides for a graphic example illustrating the alternatives available between two production choices. The trade-offs can be illustrated in either linear or non-linear forms, as follows:

The linear form of the production possibilities frontier is provided below. Due to the scarcity of inputs, you can produce 10 units of good A and 0 units of good B, 5 units of good A and 5 units of good B (black arrow), or 0 units of good A and 10 units of good B. In the below case, there is a **1-to-1 trade-off** between goods A and B.
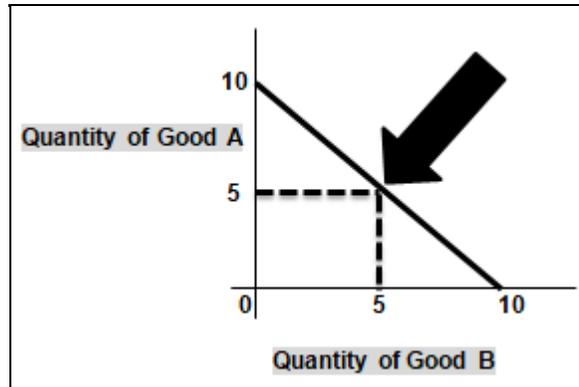

In the above and below cases, the opportunity cost of producing 10 units of good A is the loss of all units of good B, the opportunity cost of producing 5 units of good A is the loss of 5 units of good B, and the opportunity cost of producing 10 units of good B is the loss of all units of good A.

These decisions are usually made based on profit-maximizing strategies, where, for example, if someone can sell 10 units of good A more profitably, they will do this.
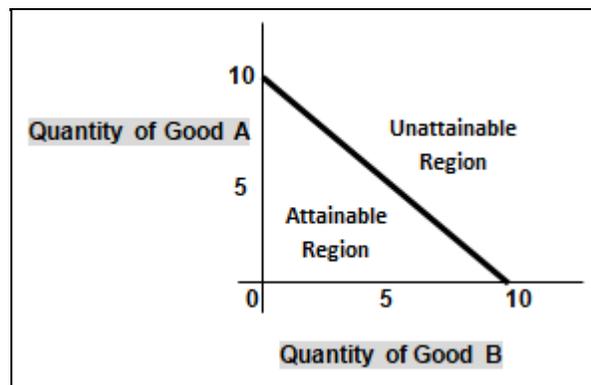
Anything inside of the production possibilities frontier is attainable (see above). Anything outside of the production possibilities frontier is unattainable.

The non-linear form of the production possibilities frontier is provided below. Due to the scarcity of inputs, you can produce 10 units of good A and 0 units of good B, 9 units of good A and 5 units of good B (black arrow), 5 units of good A and 9 units of good B (black arrow), or 0 units of good A and 10 units of good B.

In the below case, there is **an-other-than 1-to-1 trade-off** between goods A and B. This less or other than linear trade-off is characterized as a <u>principle of increasing cost</u> or a <u>law of diminishing returns</u>. This is because it costs 5 units of good B to go from 9 to 10 units of good A, and visa/versa.

In the above and below cases, the opportunity cost of producing 10 units of good A is the loss of all units of good B, the opportunity cost of producing 5 units of good A is the loss of 1 unit of good B, and the opportunity cost of producing 10 units of good B is the loss of all units of good A.
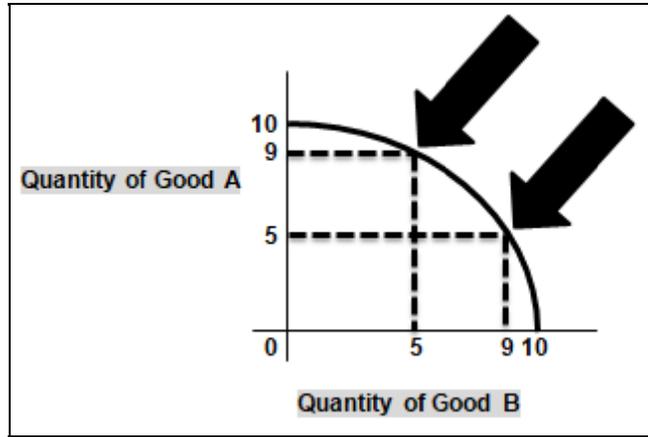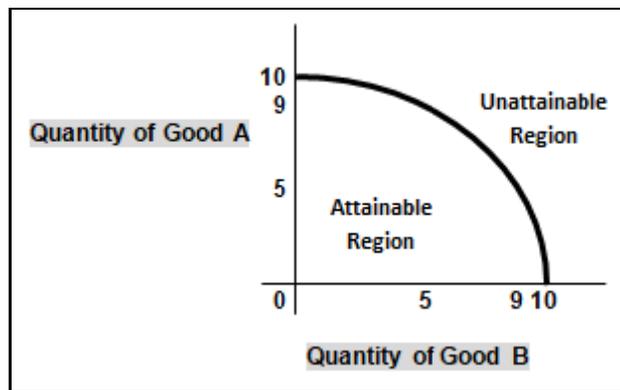
Again, these decisions are usually made based on profit-maximizing strategies, where, for example, if someone can sell 10 units of good A more profitably, they will do this.

Again, anything inside of the production possibilities frontier is attainable. Anything outside of the production possibilities frontier is unattainable.

In the above cases, profit-maximizing is presumed. However, in order to maximize profits, the firm must develop and have this information available to develop a profit-maximizing strategy.

For example, when marijuana was legalized in the state of

MARIJUANA

Washington has more pot than it can smoke

Jane Wells | @janewells
Published 10:53 AM ET Wed, 11 Feb 2015 | Updated 2:07 PM ET Wed, 11 Feb 2015

CNBC

Supply is outstripping demand in the unlikeliest place—legal recreational marijuana in the state of Washington. Growers who jumped into the new legal market hoping to make a killing in cannabis are now getting killed by a glut of product.

Washington, too many farmers entered the market. This caused an unanticipated shift in the price available for output.

The slope of the production possibility frontier (PPF), at any given point, is referred to as the marginal rate of transformation (MRT), where two separate examples, MRT_1 and MRT_2 are provided as examples, below.
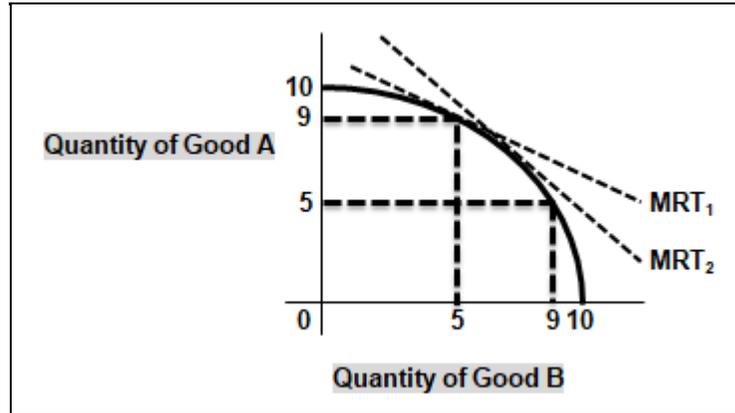
Economic growth shifts the PPF up and to the right.
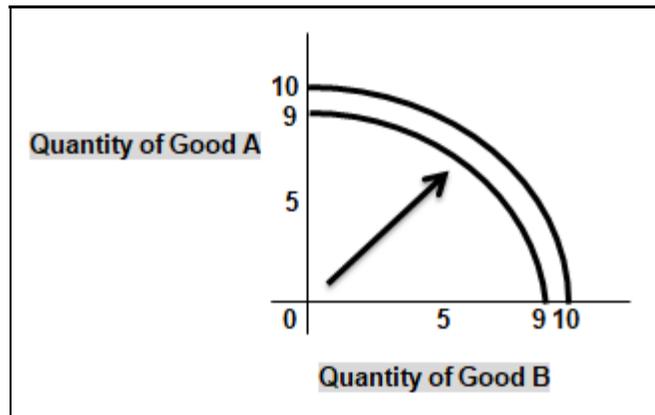
While the production possibility frontier is based on inputs and remained constant, the anticipated money price achievable for output changed, unfavorably. This topic is really more closely associated with supply and demand than the production possibilities frontier, and will be addressed in the next chapter. However, it is important to note that the decision to maximize output returns based on input is impacted by the money price available for the output, where the price for all units of output does not remain constant at all supply or output levels.

Efficiency

Outputs are said to be produced <u>efficiently</u> if a condition exists where larger amounts of output cannot be produced without increasing inputs or giving up or trading-off some quantity of another output. It represents a condition where there is an absence of waste and the maximization of output

production. Therefore, producing **inside** the production possibilities frontier is presumed to be **inefficient** (see below), and producing along the production possibilities frontier is presumed to be efficient.
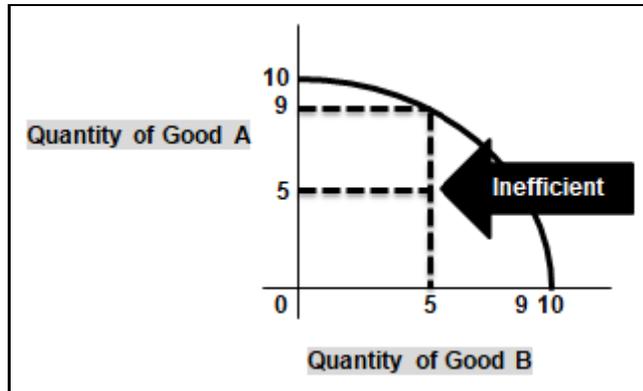
An excellent example of inefficiency is unemployment, where human capital and human resources are not consumed or deployed at capacity and to their highest and best use, and for the benefit of all. After all, unemployment represents unproductive time and time cannot be stored for later consumption and use.

The failure to maximize employment, therefore, reduces the goods and services available to all for consumption, and, necessarily, this inefficiency reduces the availability of the benefits that might otherwise be available for all and the common good.

Economic Coordination

Allocating scare economic resources to their highest and best use and for the greatest good of all requires

1. The efficient allocation and\or utilization of scarce economic resources
2. The identification of the optimal combination of goods and services to produce
3. The optimal distribution of output to individuals

These decisions are difficult, subject to bias and taste and preference issues, and it is nearly impossible to achieve consensus with respect to the optimal mix of inputs and/or outputs or the allocation of scarce resources.

Economic Coordination – 1 – Efficient Allocation of Scarce Resources

The division of labor into specialized tasks to achieve greater expertise and efficiency is a concept credited to Adam Smith in **The Wealth of Nations**, and in the context of pin manufacturing, but is also a theme of a famous film, **Les Misérables**, where several, excellent variations have been produced, including one starring Liam Neeson, perhaps better known as an action hero in the **Taken** (2009, 2012 and 2015) series of films.

In the film, he escapes from prison and stumbles onto a town, purchasing a firm that produces plates and dishes, and standardizes production and increases the quality of the product and the wealth of the entire community, in much the same way Adam Smith recommended in his pin production illustration and example.

In both cases, the <u>comparative advantage</u> of those possessing specialized skills is exploited for the benefit of all. Human capital is deployed to its highest and best use, and all benefit as a result.

Nations, of course, have comparative advantages. Canada, for example, is rich with natural resources. China and Mexico have relatively cheap labor. In the latter case, the outsourcing of tasks and activities in manufacturing has been made to China, Mexico, and other emerging markets to exploit these comparative advantages.

Economic Coordination – 2 – Identifying Optimal Production Quantities

Specialization, while achieving great efficiency and effectiveness, requires exchange mechanisms to allow for a greater standard of living for all. Money is the medium of exchange used to exploit these comparative advantages. However, in recent years, block chain technology and crypto currencies like Bitcoin have gained some attention and appreciation in value.

Regardless of the medium of exchange, a common currency or one that easily converts from one currency or medium of exchange to another is required to fully exploit comparative advantage. The market is left to decide how to use limited or scarce inputs to produce the desired or profit-maximizing level of outputs, all, while exploiting conditions of comparative advantage.

Economic Coordination – 3 – Determining Optimal Distribution of Output

The distribution of output, in an open economy or free-market system, is left to individual producers and consumers, all presumed to be acting in their own self-interest. This <u>market system</u> is less than perfect, and failures of these market mechanisms can occur (e.g., the housing crisis), but this system tends to maximize the overall benefits when compared to a command economy, such as the failed United Soviet Socialist Republic or USSR. In a command economy, the central government directly or indirectly establishes output targets, incomes and prices. China, for example, has made significant progress toward the adoption of an open market-based economy in recent decades

Summary

We all make many decisions involving scarcity and choice and opportunity costs on a daily basis. You might, for example, choose to watch a film or do some gardening, or study a topic or earn additional money with your time on a particular day.

There are trade-offs involved and the nearly unlimited combination of decisions makes it nearly impossible to quantify and examine all of them at the same time, but economists attempt to provide a theoretical model or models to examine two or more, and, to the extent practicable, develop and examine mechanisms to reduce these decisions to their least qualitative and most quantitative level.

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