

A few more concepts: marginal analysis, specialization, equilibrium, and how economists judge economics systems

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The ten second explanations

Don't be surprised if all is not grasped in 10 seconds.

Marginal analysis

Individuals often make choices on the margin

I am driving down the road with my Happy Meal balanced on my lap. Should I eat another French fry (the *marginal fry*), or stop before I gross myself out? Note that a “Happy Meal” comes with 31 fries.

Marginal X means the amount of X you get from one more unit (or from a bit more)

X could be a benefit, a cost or whatever.

I consider the *marginal benefit* and the *marginal cost* of eating another fry, where the marginal benefit is the addition to total benefits that results if I eat one more fry.

And the marginal cost is how much the total cost of eating the fries goes up if I eat one more.

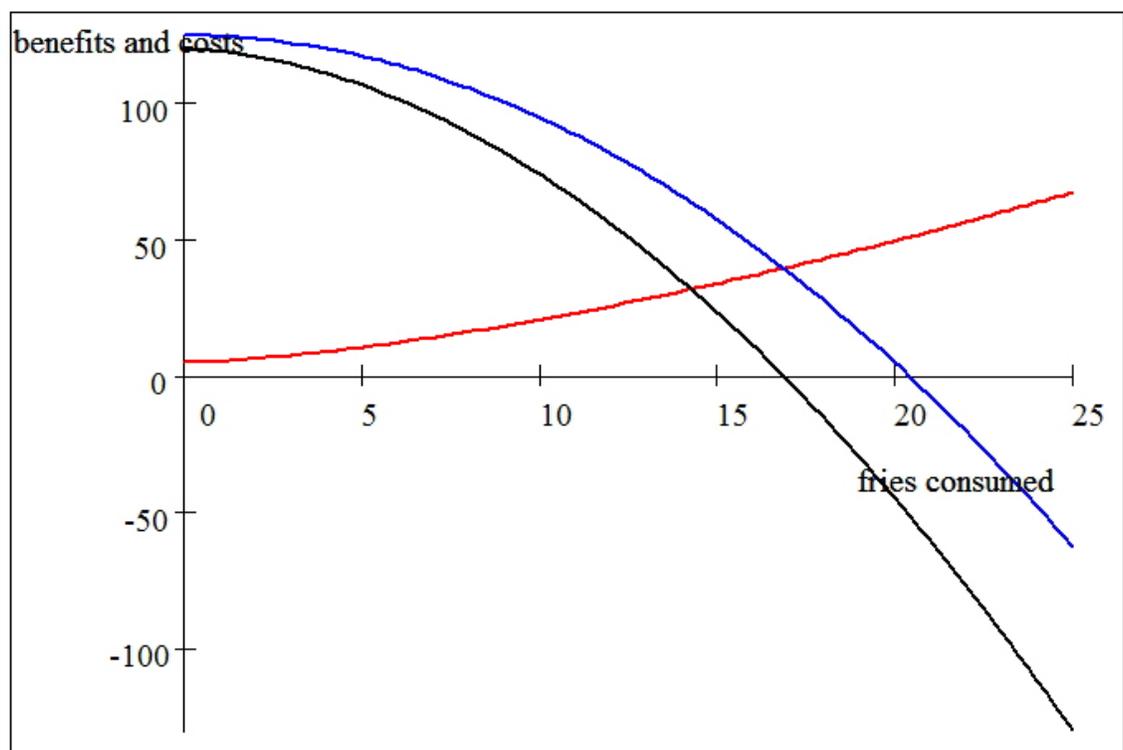
If the marginal benefit is greater than the marginal costs, I bite into and swallow another fry because it makes me better off.

In this example, the marginal benefit is the benefit/pleasure I get from eating one more, and the marginal cost is the what I sacrifice because I eat one more.

If the marginal cost to me is greater than the marginal benefit to me, I stop and give the rest to my dog, Giacomo, who, given his limited opportunities to eat French fries, always finds the marginal benefit greater than the marginal cost.

What are the marginal benefits and marginal costs to me of another fry, and what do they depend on?

To keep things simple, assume benefits come in terms of taste and elimination of hunger, and costs are future fat around my hips and waist, grease on my mouth, clothes, and car seats. Assume I do not need the calories.



The marg. benefits (blue) and costs (red) of eating another

Marginal costs are in red, marginal benefits in blue, and net benefits in black (MB-MC).

It is not important in what units we measure benefits and costs, only that we measure everything in the same units.¹

¹ All that is important for now is a cost (benefit) of 2X is twice as much as a cost (benefit) of X and positive number (negative number) reflect positive benefits or costs (negative benefits or costs)

The fries have already been purchased (remember I was driving down the road with them), so money is not an issue: the opportunity cost has no monetary component (Sunk money costs are sunk).² The opportunity cost is a thinner and healthier me, and a cleaner car.

The benefits are a function of how the fries taste (the “mouth feel” of fat, saltiness, and crunch). The first fry tastes good, but after 20, or so, according to our graph, the taste is gross.

The costs are in terms health, waist size, grease on me and car, etc.

It looks like Giacomo will get around 13.5 fries. (I will eat approx. 17.5 fries, leaving 31-17.5=13.5 for Giacomo)

Tastes vary across people. Amazingly, some people don’t like the taste of salty fat. What would your MB graph look like if you hated fries?)

Draw it. A T.A. should make this a multiple-choice question for an exam.

What units should we put on the vertical axis?

What kind of person is more or less likely to finish the bag, and why?

On average, do you think thin women, aged 45, are more, or less, likely to finish the bag than 22-year-old overweight males?

Many people finish the bag? What does that imply?

Does it imply they should have bought a second bag? No, but maybe they would benefit from a second bag.

Imagine the following experiment: Bubba arrives at McDonalds at 7 am. He can stay there forever eating fries, for free, at least in terms of money—he won the all-you-can-in-a-lifetime contest.

What will eventually happen? What does that imply?

² Money might be part of the cost, but not the money spent on the fries. Imagine that if I was not eating fries I could have been making \$10 a minutes consulting on the phone, but can’t if my mouth is stuffed with fries. I have never given up consulting in the car to eat another fry.

Backing up the decision tree, the decision to buy the bag of fries can also be viewed as a marginal decision—one more bag. Will the marginal benefit from the bag be greater or less than the marginal cost? —which, before you buy the bag, includes the money cost?

Rationally buying a bag does not mean you want to eat all of the fries in the bag. Whether to buy a bag of fries is a marginal decision. Buying a bag initiates a series of marginal decisions, whether to eat another fry from the bag

Should you “supersize?”—It is a marginal decision, made at the drive-up window.

Firms often make choices on the margin

Should the restaurant, now only open for lunch and dinner, start serving breakfast?

Opening for breakfast will increase the costs, on the margin, of running the restaurant. It will also hopefully increase revenues (someone hopefully will buy breakfast). If the expected marginal revenue from opening earlier is greater than the marginal cost, the profit-maximizing restaurant will try it out.

If the marginal revenue turns out to be greater than the marginal cost, the restaurant will remain open for breakfast.

What if the owner knew he could increase his monetary profits by opening earlier, but does not do it because he likes to sleep?

He has decided that the opportunity cost of the extra profits, lost sleep, is too high

List five decisions that you make on a regular basis that are made on the margin.

Specialization in production

Trades are often made possible because economic agents specialize in terms of what they produce.

Specialize simply means devoting most of our productive efforts to producing a few things—most individuals do not produce all of the things they consume.

For example, I am currently devoting much of my efforts to producing and giving micro-principles lectures.

Plumbers, on the other hand, devote much of their efforts to installing and fixing water-distribution systems.

Think about it; you can't eat a toilet or lecture notes. So, why do people specialize in such activities? Am I nuts?

Yes, I am, but not because I specialize; nuts and non-nuts all specialize, each producing only a small number of things.³

We specialize because in a market economy, with trades, we are made better off with each of us specializing in what we do best (relatively speaking), and then trading some of what we have produced for what we need.

Note that for many people, “Free Trade” is a dirty word.

Keep in mind a voluntary exchange between two informed parties (a trade) typically makes both parties better off, so the traders like the trades.

³ Robinson Crusoe would be an exception: he produced everything he consumed.

Not that I will be soon be quitting my University job to sell, online, decorative handmade switch plates:



I will devote my life energy to cutting and pasting cutouts from magazines onto standard white switch plates that I purchased at McGuckin's Hardware store in Boulder.

Will my children starve?

Will society be better off?



Equilibrium

Let's start with an **example** of equilibrium (and disequilibrium):

The problem with starting with an example before a definition is that we don't know what it is an example of. We will eventually get to a definition.

Wanda Sue and I, after years of marriage, have decided we hate each other's guts, and are divorcing. Neither one of us has hired a lawyer.

Given that we are divorcing, is neither of us hiring an attorney an equilibrium?

If I don't have an attorney, Wanda Sue will win big in the settlement if she gets a lawyer and I don't. Said another way, given my behavior (no lawyer), Wanda Sue wants to change her behavior (hire a lawyer).

But, the same is true for me. If Wanda Sue has no lawyer, I can win big by getting one. So, I want to get a lawyer given that Wanda does not have one.

So, remaining attorney-less, is not equilibrium: **each of us wants to change our behavior given the behavior of the other.**

One with a lawyer, the other without a lawyer, is not an equilibrium. If your soon-to-be ex has a lawyer, you want to get one fast.

Is both of us lawyered up an equilibrium? Yes. If your spouse has a lawyer, you do not want to fire your lawyer. No way, and neither does your spouse.

So, the equilibrium in this “game” of divorce is both parties lawyered up. Once we both have a lawyer, no one wants to change their lawyer status.

Why is this equilibrium? Given the behavior of the other party (ties)—in this case the soon-to-be ex—we each are doing the best we can. We cannot make ourselves better off by changing our behavior.

Said another way, we each are doing the best we can given our constraint, that constraint being our spouse has a lawyer.

Note that lawyered up is an undesirable equilibrium from everyone’s perspective, except the lawyers. (The lawyer gets a bunch of your stuff.)

From the perspective of the two individuals, the equilibrium, lawyered up, is inefficient

So, if you believe equilibriums are always desirable, you are wrong and you need to unlearn this.

Note that we have yet to define efficient and inefficient, or even equilibrium

Consider another situation: the U.S. has nuclear missiles but Iran and N. Korea do not. Each country is afraid of the U.S. and the U.S. is verbally threatening Iran and N. Korea.

Is this an equilibrium in terms of which countries have the bomb?

Is the current situation an equilibrium (U.S. has the bomb; Iran and N. Korea no effective nuclear missiles, at least not yet)?⁴

What would you do if you were Iran or N. Korea? Your enemy—the U.S. called you “evil”—and the U.S. has the bomb. In the case of Iran, their neighbor Israel also has the bomb.

I am sure there will be an exam question about [Tom Lehrer](#) singing, [“Who’s next?”](#)

So, you will want to listen, paying attention to the lyrics, and thinking about the point of the song.

You might want to listen to the related song

[“We will all go together when we go”](#)

Lehrer, an interesting guy, started Harvard at age 15.

Another example: market equilibrium

Consider gas-guzzling SUVs

I, an environmental economist, own two of them.

There are firms producing SUVs so they can sell them for a profit

There are consumers who have a desire to buy SUVs, but whether they buy or not depends on the price.

⁴ This example becomes less correct as the years pass.

The market for SUVs will be in equilibrium when everyone involved, or not involved in the market, is doing the best they can given the price of SUVs.

More specifically, in equilibrium everyone who wants to buy an SUV at the going price is successful – there is no unfulfilled demand.⁵

Everyone who wants to produce and sell an SUV at the going price is: not one wants to sell more or less than they are currently selling. There is not excess supply.

The producers of SUVs are maximizing their profits

Consumers are doing the best they can, given the price of SUVs, along with all other prices

Another way of describing equilibrium in the market for SUVs is the price is such that demand for SUV equals the supply of SUVs. Given the price, no one can do better by changing their SUV buying or selling behavior

⁵ Be careful with the expression, “wants to buy an SUV at the going price.” It does not simply mean I would like to have a SUV. It means I want to buy one at the going price, the statement indicates that buying one at the going price will make the person better off.

Defining equilibrium

I will define equilibrium in terms of an economic system

An economic system is in equilibrium when everyone is doing their best subject to their constraints, which includes what everyone else is doing.

Consider a society of two individual: you and me. You are dictator and I am your slave, Edward Slave Boy.

The system is in equilibrium if am doing the best I can given my slave status (a constraint on me), and you are doing the best you can given that you have a slave and are in charge of everything I do.

When is an individual in equilibrium? An individual is in equilibrium when she is doing the best she can given her constraints (income, prices, and what other people are doing)

If for example, you as a slave owner are “guilted out,” and will be better off if you set me free, but haven’t yet, the system is not in equilibrium.

If I am planning to kill you because I would rather be dead than your slave, and able to kill you, but have not yet killed you (I am getting ready), the system is not in equilibrium.

But if neither of us wants to change things given what the other is doing, we are in equilibrium.

This does not mean I enjoy being your slave

If a consumer is doing their best given their constraints the individual is in equilibrium: **she has no desire to change anything.**

Consider my next example. Its point is to bring us to the realization that most equilibriums do not last forever: something happens (an exogenous event) that causes the equilibrium to no longer be an equilibrium.

Coke on head??

There are three people in [Wiggins CO](#) between the ages of 18 and 55: Avery, Dakota and Skyler—their parents were into gender-neutral names.

Each was born in Wiggins and due to the “Wiggin’s curse” can never move away. Currently, none are married.

This is the Wiggin’s dating set and the Wiggin’s marriage set.

They all “like” each other, and each would marry one of the other two.

Currently they all are unmarried but want to get married, so the current state is not an equilibrium.

Avery and Skyler run into one another one night at the 7-11, both are drunk. They express their undying love for one another, drive to Denver (short trips are possible) and get married.

Assume this new state of affairs is an equilibrium: Dakota is unmarried but that is his or her only option—few young people move to Wiggins and importing a spouse is against the law.

Avery and Skyler each prefer marriage over singleness, but do not care which of the other two they are married too. That given, it is a hassle to change spouses so they stay married to each other.

The equilibrium persists for ten years. **Then an exogenous event occurs;** Jordon moves to town and Jordan is hot.

Avery, Skyler and Dakota all take their chances with Jordan, and the marriage equilibrium dissolves in pools of passionate lust.

After the divorce, Avery ends up married to Jordan, and Dakota to Skyler.

This is a new equilibrium: marriage wise; everyone is now doing the best they can given what everyone else is doing.

Note how the arrival of Jordan caused the initial equilibrium to dissolve and a new equilibrium to arise.

Much of the study of economics asks what the new equilibrium will be after some exogenous event.

For example, if we cut taxes for rich people and get rid of government regulations (an exogenous change) what will the new economic equilibrium be in terms of jobs, GDP, etc.? (this is a macro-economic question)

How economists judge economic systems

Economists judge an economic system/process based on two criteria: efficiency and equity

We will come back to efficiency and equity in great detail, but for now only the basics

Write down your definition of efficiency. Then tear it up. Or better, burn it, outside.

My bet is that everyone's answer is not the economic definition of efficiency. So, **unlearn** your definition.

Efficiency

Production and distribution is **inefficient** if it is currently **possible** to change things in a way that would make some members of society better off without making any members worse off.

Note the word **possible**.

The current state of the economy (what is produced and how it is distributed) is efficient if the **only** way to make some members of society better off **requires** that other members are made worse off.

An inefficient state of the world is therefore a state of the world where there is the potential for a free lunch (making some better off without making any other member of society worse off).

In other words, the current state of the economy is inefficient if it is **possible** to change things so that after the change some members of society are better off and none are worse off.

A change that makes some members better off and no members worse off is *efficiency increasing*

A change that makes some members better off and some members worse off is efficiency increasing if the gainers **could** compensate the losers for their losses, and still be gainers.

A change that makes some members better off and some members worse off is *efficiency decreasing* if the gainers **could not** compensate the losers for their losses, and still be gainers.

Note the difference between the terms **efficient** and **efficiency increasing**.

If a change is efficiency increasing, before the change occurs, things are inefficient.

Production and distribution are efficient when all the potentials for free lunches have been exhausted.

Everything else constant, economists prefer more efficient to less efficient.⁶

⁶ Often, everything else is not constant.

Equity

Equity is a synonym for fair.

There are two equity issues:

Who is, and who is not, a member of society?

And,

How much should each member's welfare count relative to the other members of society?

Everything else constant, economists would like production and distribution to be fair/just

They want a fair allocation of goods and services

How is fairness determined? Good question.

For economists, what is fair is a matter of opinion: there is no objective answer. Said another way, equity is a normative concept.

Your conception of fair likely has a lot to do with why you think you and other people behave the way they do. Why you behave the way you do is a positive rather than a normative issue.

An aside: Sustainability

Sustainable simply put, too simply put, means that it is possible the current situation can be maintained, either forever, or at least for a long time.

Said another way, *un-sustainable* implies that there is something about the current situation that will cause it to end.

While many people would argue that a society would like its production and distribution decisions to be sustainable, this is a goal many economists would argue should not be a primary goal.

An example of why “sustainable” might not be desirable.

Consider you and your significant other trapped in a spacecraft trapped in orbit, forever. You are the only living humans.

You have enough resources for every generation to reproduce while living in misery.

You have two kids, everyone is miserable. You and your significant voluntarily starve to death⁷ when your kids are old enough to make it on their own; your kids have two kids; your kids voluntarily starve when their kids are old enough to make it on their own. Forever—everyone is miserable.

Or, you can have a good time for 20 years remaining childless, at which point you run out of stuff, die, and humans go extinct.

Is the sustainable path necessarily the preferred path?

Note that if you were both of the same gender, there would be no issue, or guilt, associated with bringing life on the spacecraft to an end.

⁷ Otherwise there would not be enough for your kids to survive.

Inquiring minds want to know

If at this point you are not yet sure what efficiency means, stop and do not read further until you are sure.

Equity is typically presented as a normative concept; there is no correct and universal answer to the question of what is equitable.

In contrast,

Efficiency is typically presented as an objective concept: everyone would agree whether an allocation is, or is not, efficient.

But it is more complicated

If we all agree who is, and is not, a member of society, efficiency is an objective concept

But, who is, and is not, a member of society, is a normative concept

And adding or subtracting members from society one can often make an efficient allocation inefficient, or an inefficient allocation efficient.