[SQUEAKING]

[RUSTLING]

[CLICKING]

PROFESSOR: All right, let's get started. Today, we are going to start a new part of the course and introduce really a new concept that will guide a lot of what we'll do for the rest of the semester.

So what we're going to do is we're going to return to our supply and demand framework. But within that framework, we're going to use it to turn to talk for the first time about normative economics. Remember, positive economics is the way things are. Normative economics is the way things should be. We haven't given you any tools of normative economics yet. We will today.

So let's start with the standard supply and demand equilibrium. And what happens when you shock, shocks to demand and supply. We now know where the demand supply curves come from. We developed the demand curve from for consumer theory. The supply curve for producer theory. You should be able to, at your leisure, if I give you the primitives, like the utility function and prices, or the production function and prices, and the nature of the market, you should be able to derive demand and supply curves.

So let's start with a standard market, which is the market for gas. So Figure 9-1 has the general market for gas. On the x-axis, you have quantity, which is gallons of gas. In the y-axis, you have price, which is dollars per gallon. You've got a demand curve, which measures the willingness of consumers to pay for the good.

So it's the marginal willingness to pay. Each point on that demand curve represents the amount consumers are willing to pay for that next unit. You have a supply curve, which is the producer's marginal willingness to supply. Each point on that curve represents the producer's willingness to supply that next unit. OK?

Demand curves slope up-- I'm sorry. Demand curves slope down because as the price goes up, you're less willing to buy the next unit. Supply curves slope up because as the price goes up, firms are more willing to supply the next unit. And equilibrium is the point where supply equals demand.

We're both consumers. And producers are happy. At the point, P1, Q1, consumers are willing to buy Q1 gallons of the price P1. That's on the demand curve. Producers are willing to supply Q1 gallons at a price P1. That's on the supply curve. Therefore, you're in equilibrium at point little e1.

OK? That's our basic framework. That's literally going back to the first lecture. We did this graph for roses rather than gasoline. I've now told you where those curves come from. In the first lecture, we just talked about the demand supply framework. I've now built up the primitives to tell you where those curves come from.

Now, what I want to ask next is, what happens if there's shocks in the demand and supply framework? How does that affect the equilibrium? How does it affect prices and quantities?

So for example, suppose that tastes change. Remember, what determines the demand curve is utility function and your budget constraint. Your utility function is a representation of your preferences. Suppose your preferences change, OK? Suppose, for example, that people suddenly start to want to drive big cars.

So you say, look, I like having a big car. I feel safer on the road. It's better in bad weather. I want to start driving SUVs, and minivans, and other big cars. We'll call that a preference shift. So the utility function has changed. People now have more preferences for big cars.

Well, what does that do to the market for gas? Well, big cars are a complement to gasoline because big cars use more gas. So if you want a big car, you're going to use more gas. What that means is that you're going to see a shift outwards in the demand curve for gas. People want big cars. Big cars use more gas. The demand curve shifts outwards from D1 to D2.

At any given price of gas, consumers want more because their tastes are for a bigger car that uses more gas. So if we imagine for a minute the price being unchanged. Imagine the price stayed at P1. What would happen? Well, if P1 suppliers are still willing to supply Q1, but consumers now want Q1 Prime. Since they want to drive big cars, if the price of gas is the same, they want more gas. The problem is producers won't produce it.

So we have what we call excess demand. The difference between Q1 Prime and Q1 is excess demand. Consumers want more gas than producers are willing to supply.

So what happens? Well, the market equilibrates. What happens is you slide up the supply curve, from point E1 to point E2. Suppliers seeing the excess demand say, hey, I can raise prices. Consumers suddenly want more gas. I can raise prices.

Consumers, as prices rise, want a little less gas because the demand curve is, after all, downward sloping. And that continues until you reach point little e2. At point little e2, you are back in equilibrium, because at point little e2, given the new tastes, consumers are happy with Q2 gallons of gas at a price P2. They're willing to pay more to get more gas because they want more gas-guzzling cars.

Producers are still in their supply curve. So they're happy. As long as they're in a supply curve, they're happy. So basically, what happens is when the shift in demand, and a shift outward in demand, you instantaneously create excess demand. Suppliers respond to that by raising the price. And you eventually shift to a new equilibrium where once again, both parties are happy.

OK? You can't keep the price constant because given new consumer tastes, that would lead to excess demand for gas. OK? Questions about that?

OK. Let's do the flip side. Let's say that the supply curve shifts. Imagine there's suddenly a war in the Middle East. And suddenly gas gets much harder to get. The marginal cost of producing gas goes up, for example, because it's more expensive to ship it from the Middle East to the US. Or because, for example, we can't buy from Middle East sources anymore and we have to buy from less efficient, higher minimum average cost sources, like the US.

So because of that, the marginal cost of producing gas has gone up. The supply curve is the marginal cost curve, above the shutdown point. So that means there is a shift upward and inward of the supply curve. In other words, producers are saying, given the higher marginal cost, I need to get a higher price to produce any given quantity of gas.

So producers are saying, look, if the price stays at P1, I'm only going to produce Q1 Prime, I'm going to produce less. If the price stays at P1, I'm not going to produce as much gas because it's more costly to produce gas. So I'm going to be further down my curve.

Well, at that point, consumers still want Q1. Producers only want to produce Q1 Prime. So what do we have again? Excess demand. Excess demand this time not coming from a change in preferences, but from a change in the underlying cost of production.

So what happens is excess demand, in this case, you slide up the demand curve. Consumers, knowing that they have extra demand, say, look, we're willing to pay higher prices. Producers say, well, if you pay higher prices, we're willing to produce more. And you end up at the new equilibrium, little e2. At little e2, once again, both parties are happy.

Consumers are happy because they are still getting there on the demand curve. Their marginal willingness to pay for Q2 gallons is P2. Producers are happy because they're happy to produce Q2 gallons at P2.

Now you might say to yourself, well, gee, how can consumers be happy? Life has changed. Well, I'm not comparing their happiness across the two equilibriums. I'm just saying their equilibrium. We're going to come-- that's exactly what we're going to talk about in a little while, which is, what has this done to the well-being of consumers?

What I'm talking about now, I shouldn't even use the word happy. I should say in equilibrium. Consumers are willing to pay that price to get that quantity. But you should immediately think, gee, consumers look like they're kind of worse off here. And we're going to come back to that. That's what we'll be focusing on in this lecture.

Now what's an important thing to note, if you look at Figure 9-2 and 9-3? In both cases, the price went up. Yet in one case, quantity went up. And in one case, quantity went down. The bottom line is, you can't tell from a price increase alone if there's been a supply shift or a demand shift.

This is a lot of what drives empirical economics. You can't just observe the one feature in the market and say, I'll tell you what's going to happen to the two outcomes. No, you have to observe both price and quantity to tell me if there was supply shift or demand shift. OK?

Now let's ask, why do these curves shift? Why, in general, we'll give you lots of fun examples on tests and problem sets, of shifting demand and supply curves. Why do curves shift? Well, why do demand curves shift?

They shift fundamentally for four reasons. First, your income changes. If people's income change, it shifts their demand curve. OK?

The second could be the change in the price of a complement good. Change in the price of a complement. OK? Change in the price of a complement.

There could also be a change in the price of a substitute. I did a complement example, but you should be able to see what, for example, would happen if people suddenly wanted smaller cars and why that would lead to a demand curve to shift in the other direction.

And then finally, as we covered in our example, a change in preferences. So those are the reasons why demand curves can shift.

Why does supply curve shift? Why does supply curve shift? For really just for two simple reasons. One is a change in input prices. And two is a change in technology.

So these sorts of outside influences can shift the demand supply curves. In the video that accompanies this lecture, I do a fun example, which is what happened when Kim Kardashian, who has more Instagram followers than there are people in France plus England at this point, decided to post that you could lose weight by exercising in a corset. A corset is a medieval thing women used to wear to tighten their waists.

Fortunately, a couple hundred years ago, women stopped having to wear those things. But Kim Kardashian posted, in fact, if you wear a corset while you exercise you'll lose weight. Now, in fact, she's wrong. There is no evidence that if you wear a corset while you exercise, you lose weight. But she's an influencer, as they say. And immediately there was a surge in demand for corsets.

At that time, there was one corset company because they're medieval. And that corset company started making gobs and gobs of money. Why? Because since demand shifted out, they raised their prices and raised the quantity, and they started making a lot of profit. So that's an example of a preference shift that shifts demand.

But what do you think happened next? I mean, later we realized it was a bad idea. But before that. What happened in the market for corsets next? Yeah. Go ahead.

AUDIENCE: Price increased.

PROFESSOR: There's a price increase. I said that. That's right. And more profits. But what happened after that?

AUDIENCE: Maybe there were more corset companies.

PROFESSOR: Yeah, remember our last lecture. Firms entered. When there's profits, it causes entry. So suddenly there was a bunch of corset companies that popped up and eventually drove the price back down. Saw how much profit to be made in the corset market. They're presumably all bankrupt now. I don't know.

But basically that's an example of the dynamics of how preference change can change the functioning of a market. The preference change shifted the demand curve out. That led to higher prices. Those higher prices led to an increase in profit for the one manufacturer. That led to more entry because it's a free entry market, there's low-fixed costs in making corsets. That drove the profits back down. OK? Questions about that? Yeah?

AUDIENCE: Not necessarily about the corset example, but can you go over the first bullet point for what changes in the demand curves.

PROFESSOR: What are those demand-- the fourth one or all of them? The first one is a change in income. I'm sorry. Change in income. Income or preferences changing influences demand. OK?

So now with that in mind, let's talk about how all this depends on the shape of demand and supply. Let's talk about how all this depends on the shapes of demand and supply. OK? Let's once again talk about an inward shift in supply, like the war in the Middle East that raises the cost of producing gas. Figure 9-3 shows what happens with a standard supply curve.

With an inward shift in supply, prices rise, quantity falls. What, however, if demand was perfectly inelastic? Perfectly inelastic demand is a good where the quantity demand is insensitive to price. An example we talked about last time was insulin for diabetics, where you're not going to risk your life over $1 here or there, OK, if you can afford it.

I don't want to be too glib. Insulin is very expensive, but if you can afford it, you'll pay for it regardless of the price. That leads to a perfectly inelastic demand curve for insulin. A vertical demand curve for insulin.

Now what happens when the supply shock? Well, supply shifts from S1 to S2. Quantity does not change because quantity can't change because inelastic. All that happens is price goes up. So we have a flat if we have a perfectly elastic demand curve.

Remember I talked last time, that would be an example of something like McDonald's versus Burger King. In that case, if the supply shift, it doesn't affect the price. Why doesn't it affect the price? Because remember the perfectly elastic demand, you can't change price. OK? You can't change price. Price is fixed because if you charge one penny less, everyone will buy from you. By one penny more, nobody will buy from you.

So these are the extreme examples. And obviously, we have cases in between. So that's where the elasticity of demand comes in as we think about shifts in the demand and supply curve. OK, so that's just a little background to the main highlight of today's lecture, which is not the screaming gorilla, but rather thinking about consumer and producer surplus.

As I've said so far in this lecture, we have focused purely on positive economics, the way things are. How consumers decide for a given set of price and income, how many cookies to eat? How producers decide for a given set of input prices and a competitive market demand, how many widgets to produce?

We've not talked about how we feel about that. The normative side. Is that good? Is that bad? In particular, let's say a particular extreme example.

We showed, in the long run, with a perfectly competitive market, there are zero profits. Well, how do we feel about that? Well, on the hand, for consumers, that's a pretty good deal. The price is low as it possibly can be. You're buying at the lowest possible price because the product is producing efficiently as possible.

For a producer, not such a good deal. They're making zero profits. And maybe that matters. Maybe we care about the companies. Maybe we care about the companies in America who have to hire us and give us our jobs. Maybe we don't just care about the consumers who buy the goods.

So how do we think about whether that outcome is one we like or don't like? And the answer is, we turn to the tools of what we call welfare economics. Welfare economics. Now sometimes people use welfare to refer to money we give to poor people. I'll come back to that later in the semester.

When I say welfare, almost always this semester, I mean, it's an economic term for well-being. Welfare is the welfare of society. It's the well-being of society. Welfare economics is the normative side of economics. And basically the idea of welfare economics is to measure the actual well-being that's created by different circumstances.

Now to do so, technically, we would measure the change in utils. So we'd say in the two different outcomes, how do people's utils change? But I told you already, utils are meaningless. Utility is an ordinal concept, not a cardinal concept.

So this stymied economists for a long time. How do we measure well-being when we can't measure utility? Until they come up with a very clever idea. And the clever idea was to use what we call compensating variation, which basically means, instead of asking how happy or sad I am, ask me how much money I would pay to be that happy or pay to avoid being that sad. Use a concept economists call revealed preference.

Don't try to measure my preferences. Get me to tell you what they are by getting me to reveal the prices I will pay for different changes in the environment. OK, so consider my demand for my favorite band, The Killers. OK?

Let's say The Killers are on tour. I saw them three times their last tour. OK, let's say they're on tour. And let's say I get huge utility the first time I see them. A little bit less utility the second time. A little bit less in the third. Still very positive, but it falls. OK, because I just saw him the night before or whatever.

But I have diminishing marginal utility of Killer's concerts, like with any other good. OK. So then you ask me, John, how much would I have to pay you to miss a Killer show? Or alternatively, if the tickets are sold out, you can ask me, John, how much would you pay me to go to a Killer show?

OK, those are the kind of questions that reveal my preferences. And in particular, they reveal my consumer surplus. My consumer surplus is the benefit that a consumer gets from consuming a good above and beyond the price they've paid. The benefit the consumer gets from consuming the good above and beyond the price they've paid.

So for example, imagine I could get a ticket to a Killer show for $100. If my marginal willingness to pay for that show is exactly $100-- well, first of all, if my marginal pay for that show is $90, what do I do? I say no.

OK, what if my marginal willingness to pay is $100? Well, then I'm indifferent. Let's say I say yes. Let's say it's $100.01. So let's say I say yes. But I get no consumer surplus because I was pretty indifferent between going and not going.

But let's say my marginal willingness to pay for a Killer's constant is more realistically for the first show, at least, more like $300 or $400. OK, which I'd happily pay to go see The Killers if they came back around again. OK. Well, then I've derived a huge surplus because my marginal willingness to pay was $300, but they're only charging me $100.

I have made surplus. I am better off than if that opportunity never existed. If the ticket was 100 and I was willing to pay 100, then I'm no better off for The Killers coming to town. I'm indifferent. But the ticket was 100 and I was willing to pay 300, then I'm better off because I got to see The Killers at $200 less than I wanted to pay.

So basically, consumer surplus is measured by my willingness to pay. Well, economically, how do we measure willingness to pay? Well, how do we represent that? Someone raise their hand and tell me. How do you represent willingness to pay, in our models so far? Yeah.

The demand curve. We already have a measure of willingness to pay. So the consumer surplus is simply the demand curve above and beyond the price that's paid. So look, for example, at Figure 9-6.

Suppose that my demand for concerts is given by the blue line. OK, I am willing to pay about 500 for the first concert and so on. All the way down, I'm willing to pay $100 for the fifth Killer's concert. That's probably about right for me.

So basically, what does that mean? That means that the consumer surplus is the area above the price line below the main curve. So for example, for that first Killer's concert, I get a surplus of the triangle that is a base of 1. And draw a line from 500 over to the blue line. The triangle above that is the surplus I get from that first Killer's concert, that little triangle. Or in other words, I'm willing to pay for that first Killer's concert more than $500. It's hard because it's discrete. Let's say $500.

Well, that ticket, if the ticket's only $100, then I make a huge surplus. For the next concert, I'm willing to pay somewhat less, but I still make a surplus. By the time we get to the fifth concert, I'm indifferent. I'll probably still go because I'm a nut, but I won't really-- I'll be indifferent about it. I won't get any surplus.

So the surplus is what I get from all those earlier concerts I was able to go to where the amount I valued them was above the price. OK. So basically consumer surplus is how much-- it's sort of a weird-- it's a theoretical concept, but an important one. Think about any trade you've ever made, any good you've ever bought. You have some underlying willingness to pay.

If your value of that good was below the willingness to pay, you didn't buy it. That's easy. But you probably didn't think about, gee, you probably many times in your life have said, wow, what a great deal. I would have paid a ton for that. OK. I saw an awesome concert last night that cost me $50. I would have happily paid twice for that concert. I got a big surplus.

OK, so basically we run this all the time in our lives. Now questions about that? About that concept? Yeah.

AUDIENCE: What does the surplus actually do for you? Is it something that you store up over time?

PROFESSOR: That's a great question. Think of it right now as your well-being that you get from that purchase. It's a measure of utility. It's a measure of your welfare. So right now, just think of it as an abstract measure of welfare. How happy you are made?

That's why I shouldn't use the word happy. Before I should have said equilibrium. This is happy. How happy you are made by getting to make that purchase. So in other words, the fifth concert, I am not made happy by buying it. OK, but the other ones I am. Yeah. Speak up, so folks can hear.

AUDIENCE: So do insulin buyers never get any surplus?

PROFESSOR: Great question. We'll come back to that. So let's turn from individual consumer surplus, this is my individual consumer surplus, to market consumer surplus in Figure 9-7. Now we're back to the market for gas. Now we have a whole market.

We have the quantity of gas and the price of gas. Now let's not think now about each gallon of gas a person buys. Let's think about people lining up on this line. Let's think about a simple case of everyone wants one gallon, just to make life easy. Everyone wants one gallon of gas.

Then this line, you could do gallons equal people. OK? You could do gallons equal people. And what this says is the first person, the highest demander, is willing to pay a ton for that gallon of gas. But as you go down the demand curve, you get to people who care about gas less and less. Ultimately, there's a price of gas of $3.

I'm going to say that represents the 1,000th consumer. What I'm going to say is that person is indifferent between buying gas for $3 a gallon and walking, or doing their bike, or whatever else they do instead, or just not going out. What that means is everyone to the right of Person A won't buy gas. We knew that already. Their willingness to pay is below the price.

But everyone to the left of Person A gains welfare. They gain well-being because they got a good deal. OK? And it's really, this is our measure of utility in the real world. Remember, I said you can't measure utility. You can't measure utils. Well, now we're measuring it.

I have just given you a measurable quantity. We know how to draw a demand curve. We know mathematically how to represent a demand curve. You can mathematically compute the area of this triangle. I've mathematically come to this question earlier. I have mathematically represented your welfare, your well-being because we can compute this triangle.

And now I can make normative statements. Before, I can only make positive statements because utils were meaningless. Now with this idea of compensating variation, consumer surplus, I can make normative statements. I could talk about how well off you are. OK.

So let's talk about two applications of this consumer surplus idea. First is, what if the price rises? So for example, look at Figure 9-8. Imagine the price of gas rose from $3 to $3.50 a gallon. Well, now what happens? Two things happen.

First of all, fewer people want gas. We knew that already. We know that if the price goes up, demand curves slope down. So fewer people want gas. So now the marginal purchaser, the person for whom surplus is 0, is the 900th person, and Person 901 to 1,000 no longer buy gas. Person beyond 1,000 didn't buy gas anyway.

So what has happened to consumer surplus? Two things have happened. First of all, fewer people are getting the surplus. It used to be 1,000 people got surplus. Now only 900 people do. Second of all, those 900 people are getting less surplus because the price has risen.

So there's a loss in consumer surplus of the entire gray triangle, of the entire gray polygon. The rectangle, the rectangle is the amount that the first 900 consumers lost. They still buy gas, but they're less happy about it. They get less utility from it-- not less utility, less welfare from it, because the difference between their willingness to pay and price has shrunk.

The little triangle represents a lost consumer surplus because some people aren't getting consumer surplus anymore. So a price change causes this lost trapezoid of consumer surplus through those two mechanisms.

Now let's come to another question. And the answer is already given here. When is consumer surplus large or small? Well, that's going to depend critically on what? The elasticity of demand is going to determine when consumer surplus is large or small.

So let's look, for example, at Figure 9-9. Here we have two downward sloping demand curves. But one, the curve that is further to the right on the x-axis and further down on the y-axis, that curve, is steeper. It is more elastic. So that curve, the one that's further to the right, that has intercept further to the right in the x-axis-- we should label these curves for next time, Andrew. 1 and 2 or something, so I can refer to them more easily. The curve that curve is more elastic.

So let's look at consumer surplus that's provided by each of these two curves. So if you look at the more elastic curve, the consumer surplus is the area under the curve, the area under the curve above the price line. That's the dark triangle. Now as demand gets less elastic, consumer surplus goes up. So it's actually the opposite of the intuition that this person gave earlier.

The more inelastic, the more surplus. Why? Or the more elastic, the less surplus. Indeed, with perfectly elastic demand, there is no surplus. Why? Think about the case for elastic demand, McDonald's versus Burger King. Imagine you're totally indifferent. It's trivial to shop between them. Why, in that case, is there no surplus delivered? Yeah.

AUDIENCE: [INAUDIBLE] willing to pay more for the [INAUDIBLE]

PROFESSOR: Yeah, you're never going to pay more than the equilibrium because the equilibrium price, anybody who charges you $0.01 more, you just switch. Your price is fixed. There's no surplus.

Now consider insulin. With insulin, it's all surplus because your demand is essentially infinite and the price is some level. So subject to your resources, the demand for insulin, it's huge surplus, because you've got this entire infinite rectangle rising above the price line. So the size of consumer surplus will be determined by the elasticity of demand. Essentially, consumer surplus will be inversely related to demand elasticity. OK. Questions about that?

OK. People aren't the only thing we care about in this economy. We care about firms, too. So now we turn to the other side, which is, producer surplus. Producer surplus.

Basically, producer surplus is the flip of the analysis. Instead of saying producer-- with consumers, we say the surplus is between their willingness to pay and the price. For producers, it's the difference between their price and their willingness to supply. If producers get a price above their marginal cost, they make a surplus.

You can see that, for example, in Figure 9-10. OK. In Figure 9-10, this is an individual producer. Imagine that the price-- this is an individual gas producer. The price of gas in the market is 3. And let's say that producer at that price wants to produce 100 gallons. That is their point of supply curve, where the price is 3, their marginal supply is 100.

Well, that means that for the first 99 units, they made surplus. Why? Because for the first 99 units, the price was above their willing supply. Which is what? What does supply curve represent? What is supply curve? Marginal cost.

So for the first 99 units, price was above marginal cost. So they made surplus. Now in a perfectly competitive equilibrium, we know marginal cost equals average cost. So what does that mean this shaded triangle is? Can anyone tell me what the shaded triangle also represents?

If the line is average cost, if the price line is price minus average cost, what do we call that?

AUDIENCE: Profit.

PROFESSOR: Profit. So in a long run perfectly competitive equilibrium, producer surplus is way easier to understand than consumer surplus. Not some vague measure of well-being. It's dollars. It's profit. Literally, in a perfectly competitive long run equilibrium, produced surplus equals profit. Now, in the short run, it's a little complicated, and it's not as complicated.

But roughly speaking, OK, there's by and large no harm if they can produce surplus [? equals ?] profit. It's a lot easier to understand and you can really put your hands around it, unlike consumer surplus, which is harder to conceive of.

So likewise, if we go to the market, in Figure 9-11, you see there's a market supply curve. And this goes back to what I talked about last time. About why, in fact, with heterogeneous firms, with firms of different production functions, there might be an upward sloping supply curve, even if-- there might be an upward sloping supply curve even in perfect competition.

In this case, at a price of 3, there's a bunch of firms producing. The firm that produce-- Josh, there should be a big Q1 on the x-axis. The firm that produces big Q1, which is where that dashed line hits the x-axis, the firm that produces big Q1, that marginal firm earns zero profit. The price equals the marginal cost equals the minimum average cost.

But all the other firms to the left earn profit. They're the Pakistan cotton producers. All the other firms to the left are earning profits because the price is above their marginal cost, which is their average cost. So if you think about a market, there's profit being made by all the particularly efficient producers. As long as demand hits the supply curve at some point above the first producer, this profit is being made.

This is like the example with cotton, but instead of a step-wise supply function, it's a constant supply function, a linear supply function. And what you see is the same intuition. That there's a bunch of providers of gas. On the very left is the most efficient provider of gas. Their marginal cost is epsilon.

They can produce gas for epsilon, yet they get $3 a gallon. That's all profit to them. $3 minus epsilon. As you move to the right, marginal cost rises. So profit falls. Until you reach Point A. For that producer, marginal cost equals average cost equals 3, which equals price of profits, or zero. So they're indifferent. And no one enters to the right of that. So this is a linear representation of the step-wise example we did last time.

So consumer surplus is your well-being. Produce surplus is profits. Questions about that?

OK. Now, armed with that, we can go on and prove what Paul Samuelson modestly labeled the First Fundamental Theorem of Welfare Economics. Paul Samuelson, besides being a great economist, was not a humble man. I think his thesis was called something like economics. You remember what he [INAUDIBLE]. Something like, discovering economics, inventing economics, something like that. Like, he was properly proud of what he was doing.

And he called this the First Fundamental Theorem of Welfare Economics, which is that competition maximizes welfare. Competition maximizes welfare. It's a bold statement that says that the equilibrium we got to last time, in a positive sense, we showed the equilibrium last time, is also, in a normative sense, the best possible place we can be. To see that, let's go to Figure 9-12.

This shows a demand and supply curve in equilibrium, in competitive equilibrium, at point little e1, where there's Q1 units per year being produced at a price of P1. That's the initial equilibrium. You can see-- and the consumer surplus in this example. Well, somebody tell me. Use the letters there. What is the consumer surplus at point e1? Someone raise their hand and tell me. What letters represent consumer surplus? Yeah.

R plus V. Exactly. Same person, what letters represent producer surplus?

AUDIENCE: S plus T plus U.

PROFESSOR: Exactly. So producer surplus is R plus V. So consumer surplus equals R plus V. Producer surplus equals S plus T plus U. You can see that the sum of those two is maximized at point e1. And we're going to define welfare as just the sum of consumer surplus plus producer surplus.

Samuelson said, look, I have no strong feeling about whether you should care more about consumers or producers. Producers hire workers. We care about them too. Let's just use an indifferent-- let's just say social welfare is the sum of the two. Let's just say that the total welfare society is just the surplus produced on both sides of a transaction. A transaction produces consumer surplus. It produces producer surplus. We'll add them up and call that welfare.

Well, you can see that concept will be maximized at point e1. So let's do a simple example. Imagine that you are someone who says, that's ridiculous. Welfare is always better if prices are lower because consumers get a better deal.

So I'm going to set a price cap. I'm going to say, producers cannot charge more than P2. A price ceiling of P2. Well, what happens? At P2, producers say, well, look, if you can only give me P2, I'm only going to produce Q2. I have to be on my supply curve.

My willingness to supply at P2 is Q2. So I'm willing to produce Q2. So the market has Q2 at price P2. Well, what happens in that situation? Well, what happens to consumer surplus? It falls. It falls by the amount V. It falls because there are transactions that make consumers happy that are not happening.

It's critical. This is the key thing with welfare economics for consumers, or for both sides. A transaction that produces surplus that goes away is welfare reducing. Here's a transaction that produces surplus. Consumers got benefits from going Q2 to Q1, they no longer get them. So consumer surplus is down by the area V.

Producer surplus is down by two things. First of all, producers no longer have transactions that made them happy. They wanted to sell between Q2 to Q1 units, and that gave them a surplus of U. That's gone. But that's not all.

What also is gone is that now they lost the area S. But is that gone? Is S gone? What happens to S? Yeah.

AUDIENCE: It becomes consumer surplus.

PROFESSOR: It becomes consumer surplus. S goes away and gets added to consumer surplus. So what has happened here is two things. First of all, by doing this intervention, by setting this price ceiling, we've taken the area S and given it from producers to consumers.

See that? Look at the new consumer surplus. The new consumer surplus is S plus R. So we've given S to consumers. That is what we call a transfer.

We have transferred surplus from one party to another. In this case, we've transferred surplus, which we can measure as dollars, literally transferred that amount of dollars, S, and taking it away from producers, give it to consumers. Now how do we feel about that? Well, we're indifferent about that, right? Because all we care is consumers plus producer plus. We don't care about transfers.

So the movement of S from one to the other is irrelevant for total welfare, because welfare is the sum. So transfers are irrelevant for welfare. If you take something from one party, give it to another, that doesn't matter. What matters is that along the way, the and you have disappeared. Literally, they're gone. We call that deadweight loss.

Deadweight loss. Deadweight loss is the net reduction in welfare from trades that are not made. When there are trades that would make both parties better off and they don't get made, that is bad. That is a loss in welfare. We are worse off as a society, in this perfectly competitive market, if there are trades that would make both sides better off and they don't get made. We are worse off.

That is why the competitive equilibrium maximizes welfare. Because every trade people want to make and the firms are willing to do with them gets made. Anything else takes away trades that make both parties better off. And by definition, that lowers welfare. A trade that makes both parties better off, or at least makes one party better off and the other party no worse off, technically, should happen. That raises welfare.

Now, this is, of course, a conclusion under a very particular set of assumptions. We can go back to the very first lecture. Under these assumptions, we should let people sell their kidneys on eBay. The poor person who sells their kidney is better off. The rich person who buys it and stays alive is better off. That's a transaction made both parties better off. We should let it happen.

We discussed in the first lecture why I might not like that, for reasons of equity, or because the market might not work well. Well, those are all reasons why the model we've discussed so far breaks down. We're not getting there yet. Well, remember, economics, I said at the beginning, is fundamentally a right-wing science.

Maybe I didn't say it. Maybe I'll say it now for the first time. So finally, it's a right-wing science. Economics starts with, the market knows best. It starts with the first fundamental welfare theorem, which is that, under the set of assumptions of perfect competition, the best thing to do is just let the market rip.

We will come back in a couple of lectures, start talking about why those assumptions might not be true. But let's not jump ahead. This is our jumping off point for all of economics, this fundamental theorem, is that the market knows best. That welfare is maximized by just letting the perfectly competitive market rip.

That's the key conclusion here. We'll stop now. No class on Monday. And I'll see you all on Wednesday.