[SQUEAKING]

[CLICKING]

[RUSTLING]

JON GRUBER: Today, we're going to cover chapter 18,19, and maybe even chapter 20. This is the whole section on taxation. Now, we're the subsection on basic tax theory.

So chapter 18 is covering how we think about the tax base. And we're talking about last time, we talked about the Haig-Simons comprehensive income definition, the idea of measuring ability to pay by all the resources you have available. And then we said, well, that's actually complicated because resource availability is hard to define.

First of all, there are things that are out of control that change your resources. We want to let you deduct those. There are the facts you might have to pay money to earn your income. That's a legitimate deduction.

And then finally, there's the facts that some type of activities generate positive externalities. And there's an argument for allowing a deviation from the Haig-Simons tax base if an activity generates a positive externality. Just like we want to tax, we have corrective taxes on negative externalities. We have corrective subsidies for positive externalities.

Giving a tax break can provide a subsidy in the way I described last time, OK? So basically the question is, is that a sensible argument. And really, the extent to which the argument makes sense depends on comparing tax breaks to what else the government could have done with the money. I don't have any chalk. Oh, here it is.

If you think about a government, they have a set of resources. And they can support activities in multiple ways. So whether it makes sense to use a tax break as a way to encourage a positive externality depends on how else the government could have encouraged that.

So, for example, let's think about two ways. Let's say the government wants to help the homeless. And there's two ways it can do so. One is the government can build a homeless shelter. Two is the government can give a tax break for people to donate to a homeless shelter. And the question is, what is the better approach?

Well, it turns out with both, there's complications. With the first one with the government just building the homeless shelter, the complication comes from chapter 7, which is crowd out, which is every dollar the government spends towards building a homeless shelter, some will contribute to homeless shelter. But some may just crowd out private donations that are already going toward that homeless shelter. The classic crowd out problem we had in chapter 7.

So on the one side of the equation, for every dollar the government spends on building a homeless shelter, you're going to lose minus x cents in crowd out. OK? So the net you'll get will be 1 minus x.

OK, that's the net you're going to get if you spend on that. On the other 2 if you give a tax break, what do you do? Well, the important thing is to now-- the single most important concept with tax breaks we'll cover is that whenever you give a tax break, you do two things.

You have what's called a marginal effect and an inframarginal effect. The marginal effect is the effect you are trying to encourage with the tax break. The inframarginal effect is the revenues you spend on someone who is going to do that activity anyway.

So let me give you a simple example. Imagine that the government wants to encourage charitable giving to homeless shelters. And imagine the tax rate is 50%. Moreover, imagine that today there is already $1 million in giving to charitable shelters. There's one million in giving today.

Let's say the government announces it will make giving to homeless shelters tax deductible. What does that mean? That means that if you give a dollar to homeless-- if you earn a dollar and don't give it to homeless shelters, you will keep $0.50. But if you earn the dollar and give it to homeless shelters, the entire dollar goes to homeless shelters, OK?

That's because we make it deductible from the tax code. So a deductible tax break is one where essentially you do not pay taxes on the dollars you contribute. So what that do?

Well, let's assume, for example, imagine that because of this tax break, the amount contributed to homeless shelters goes from 1 million to 1.5 million. I'm just asserting that happens, OK? Well, what does that mean?

That means there is a marginal 0.5 million increase in giving. But that also means that the people who are going to give $1 million no matter what also get a 0.5 million tax break. In other words, there's two effects. You're encouraging new giving, but you're just paying off people who are going to give anyway.

The latter is not what you're trying to accomplish with the tax break. You're trying to encourage new giving. So in other words, another way to think about this is that basically, if we think about what we want to compare 1 minus x to. We want to compare 1 minus x versus the increase in giving over the dollar spent in for marginally. The dollar spent on those who would have given anyway. That's just thrown away money, OK?

So, for example, in this case-- in this case, we are saving that for every dollar the government gives in tax breaks to rich guys, it's getting a new dollar of giving. So this number in our example equals 1.

So that says that if there's any crowd at all, then it's better to give a tax break, because if the government spends the dollar on the homeless shelter, it only gets 1 minus x. But if it spends the dollar giving a tax break, it gets one.

So what will determine whether it's better to do direct spending or tax break is the amount of crowd out and the elasticity of giving with respect to-- with respect to the tax rate. The elasticity of giving with respect to the tax rate. In my example, that elasticity of giving is one. So the elasticity of giving in my example is one. That's for every dollar in tax break we gave, we get one more dollar of giving, OK? That's the elasticity of one.

Or in other words, we change the price by 50%. How do I know elasticity is one? Well, what happened to the price of giving? Every dollar of giving used to cost you a dollar. Now, every dollar of giving only costs you $0.50. So we've lowered the price by 50%, OK?

Or in other words, so we have lowered the price of giving by 50%. How much more giving did we get? 50% more giving, OK? So in other words, by lowering the price 50%, we got 50% more giving. That's the elasticity of 1-- 1 or minus 1 depending how you want to define it.

But the bottom line is, if you define it in terms of relative to a tax break, its elasticity of 1 is find a relative to a taxation is minus 1. But the bottom line is the intuition, which is that for every dollar of tax break we gave, we got one more dollar of giving. Therefore, that was more efficient than providing the homeless shelter directly. We only got 1 minus x dollars.

Now, what is x? Well, we talked about that in chapter 7. There's a wide range of x, but it's generally above 0, OK? So what that says is whether or not you want to give a tax break is going to depend on the elasticity of 2 behavior with respect to that tax break.

If people are not going to respond at all the tax break, that all you do is just give away a bunch of money. Well, then you should just build a homeless shelter yourself. If people respond a lot, then you might have this effect where actually encourage a lot of giving. And that's better than doing it yourself because you're doing-- the government itself is going to lead to this crowd out. So that's how we think about that trade off, OK?

So essentially, it's we ask whether the increase in giving per dollar spent for marginal is greater or less than 1 minus x where x is the crowd out rate, OK? Question about that?

OK, let me give you another example to drill this intuition home. So for charitable giving, the best evidence is that at this elasticity, it's actually pretty efficient to give a tax break for charitable giving. You encourage a lot of charitable giving.

One of the biggest tax breaks we give in America is for housing. In particular, let's go back to Haig-Simons. And let's ask, how would Haig-Simons treat housing?

Haig-Simons would say, for example, if you're a renter, you are paying rent and getting a service, which is the service of that apartment. If the market works well, then literally, that's a net zero operation, OK? Literally, you are paying rent. So your ability, your wealth is unaffected by renting. And you pay money in. You get housing services out. It's a net neutral.

So what does that mean? That means that basically when we look at your ability to pay, we should in some sense add to your income, your imputed housing value and allow you to deduct from your income what you spend on housing.

So your full resources in a Haig-Simons says, your full-- I want to leave this here. Your full resources in the Haig-Simons model is your income plus the value of housing. That's what you're getting. But to get that, you have to pay money. So it's your income plus the value of housing minus your payments for housing.

That would be your full Haig-Simons income would be how much you're getting in housing minus what you're paying for that housing. So in other words, if the house is worth to you exactly rent, those cancel. So what we do in a Haig-Simons system is when you report your income tax, you report the value of the housing you're deriving. And you deduct how much you pay for that housing.

Well, the problem, of course, is the latter is easy. The first is impossible. Now, actually, some Scandinavian countries do actually assign people an imputed value of their housing and tax them on it. They actually treat as taxable income, the imputed value of their housing. Yeah.

AUDIENCE: [INAUDIBLE].

JON GRUBER: Oh, in other words, they say, based on what neighborhood your house is in, how many bedrooms is, we run a regression. We say, what is that worth? Now, it's not what it's worth to you, which is what it really should be. It's just what it's worth in the market. They impute a market.

Now, in the US, we don't do that. That's pretty confusing. So we don't then allow people to deduct. We don't do this. So when you're a renter, we don't do this. But a light-line, because when you're an owner, we do.

We allow individuals who itemize to deduct their mortgage payments from their taxes. Remember, going back to last lecture, when you pay tax, you can take the standard deduction. Or you can itemize. If you itemize, the biggest thing people itemize is their mortgage payments.

So in the US, we actually don't obey the Haig-Simons rule. We don't add to your income the value of the housing you're consuming. But we do allow you to subtract the cost of that housing if you're an owner, not if you're a renter. Why do we do that? We do that because the argument goes, there is a positive externality to homeownership. Yeah.

AUDIENCE: And it works with multiple units, deduct all of those [INAUDIBLE]?

JON GRUBER: No, there's a limit Basically, you can deduct-- I think you can only-- you can deduct only your-- I forget the exact rule. But there's a limit on how many can deduct. It's either a total dollar limit or a number of properties limit.

AUDIENCE: Understood.

JON GRUBER: So basically, what we have here is a situation where we are essentially arguing that there's a positive externality to ownership. And that's why we're allowing this deduction. What's the positive externality?

Well, the theory is actually quite simple. The theory is that when people own their house, they are invested in the community. And as a result, they will deliver positive benefits to that community.

When you own a house, you participate in the schools. You participate in making the town a nicer place to live. You also make your house look nicer. When you rent, you let it go to shit because what do you care? When you own a house, you make the house look nice, which makes everybody's house around you more valuable. So there's positive externalities for ownership is the argument.

Now, how do we evaluate that argument? Well, we need to know two things. First of all, we need to say, how big are those externalities? And second of all, we need to ask, how elastic is that-- is the home ownership decision with respect to the tax break? That's this concept.

Well, in fact, the answer is that home ownership is completely inelastic with respect to the tax break. The home ownership rate has been constant at 65% forever. It went up during the housing bubble of the 2000 when there was a change when in effort-- and quite frankly, I was there when this housing bubble started and quite frankly, a well-meaning effort to increase home ownership rates.

We changed the rules to allow people to make it easier to qualify for a mortgage. And too many people bought homes. But now, it's back down close to its steady state level. It's pretty much a constant. And there's lots of studies which show that home ownership does not respond to taxes here and in other countries. Yeah.

AUDIENCE: How much of that home ownership rate vary across countries?

JON GRUBER: A lot. For lots of different reasons.

So basically, we have a situation where, yes, home ownership may deliver positive attributes. But it doesn't matter because the tax break isn't encouraging home ownership. What is the tax break doing?

Well, the tax break is a break on the size of your mortgage. The bigger your mortgage, the bigger tax break you get. So it just encourages people to buy more expensive houses. It's not clear what the positive externality is there.

In fact, if anything, the x side could be negative. Why? Why could encouraging-- yeah.

AUDIENCE: It encourages people to build more expensive houses instead of more affordable housing?

JON GRUBER: There's that. What else? What else from chapter 17? Why might there be a negative effect on us if we encourage bigger houses? Yeah.

AUDIENCE: Bigger house. Less dense areas. More [? colleges then. ?]

JON GRUBER: You guys are all thinking about very good housing. I'm thinking about utility functions, which is, remember, if my neighbor builds a bigger house, that can make me sadder.

A race where we all just build bigger houses can leave us all indifferent just with bigger houses, because if all I care about is a relative value of my house. And everyone just builds bigger houses where all equally happy at the end of the day, OK?

It's not clear what the positive externality is for a bigger house. It might even be negative for reasons you've raised about the environment and zoning. But also, reasons are simple relative referent-- relative utility functions.

The bottom line is there is really no good argument for this tax break. All it does is encourage people to buy bigger houses. It doesn't actually encourage home ownership. If you want to encourage home ownership, then something like a tax break for actually owning a home for first time tax buyers or something like that might make sense. But actually subsidizing mortgages doesn't really do-- doesn't really do anything.

So the bottom line is that we have a situation here where on the one hand, when you subsidize charity, you get a lot more of it. So there's an argument for using that tax tool. Here, there's no arguing the tax tool. When you subsidize mortgages, you don't get more homeownership. You're not getting these positive externalities, OK? Questions about that?

This is the intuition I want you to have when we think about tax breaks. Whenever you think about-- tax breaks sound great, right? It's a costless way to encourage behavior. We're just giving them a break in their taxes.

What's the cost? The cost is that you're losing the money on the people who would have done that anyway. There is a revenue cost to tax breaks. And that is consequential because that money could have been used elsewhere. Yeah.

AUDIENCE: I was wondering just the reason why they still exist. [? Or freely ?] input?

JON GRUBER: Yeah, it's-- the last refuge of scoundrels is chapter 9. Basically it exists. This is the classic thing we've talked about in other context, which is once a bad policy's in place, it becomes incredibly hard to get rid of it.

Here, it is absolutely true if we got rid of this. We'll talk about this more when we come to chapter 25. There's a very challenging issue. It's a legitimate challenge. It comes to the concept of horizontal equity.

What do you do when there's a bad law in place, but markets have adjusted? And so people will get hurt when you change. If we got rid of this, house values would fall because house values embed the tax break that comes here.

Houses are cheaper to have because you get to deduct your interest. If you didn't, housing would become a more expensive endeavor. And therefore, house prices would fall. People would want fewer houses. That would be bad for people who own homes.

So there's what we call a transitional cost of getting to the right spot. And that transitional cost is very politically challenging. Yeah.

AUDIENCE: So you're saying this mortgage subsidy only affects all the people that are already homeowners wanting to buy bigger homes?

JON GRUBER: Or initially buy a bigger home. But it doesn't affect your decision to buy a home.

AUDIENCE: Sure. So there's no marginal individual that is currently renting, but this mortgage subsidy would push them to want it?

JON GRUBER: I'm not saying none. We deal in averages, not individuals. The elasticity is indistinguishable from zero. There may be a few people, but not a measurable clump of people who are literally moving because of this tax break. It's not literally making the difference between their-- between renting and owning. Yeah.

AUDIENCE: I'm having a bit of a hard time parsing between [INAUDIBLE] assisting crowd out. What would that look like for this example?

JON GRUBER: Well, here, the counter actual would be instead of giving the tax break, I could use public dollars to build housing.

AUDIENCE: [INAUDIBLE].

JON GRUBER: Well, what would that do? Well, for every dollar, I'd used to build housing. Would I get a dollar more housing? No, some of that would just crowd out housing that would have been built anyway.

Some of that will just say private individuals going to build that housing. They say great, the government is building. I'm not going to build it now. So it's like, each of these, the inframarginal effect and the credit effect operate similarly.

They're both things that are offsetting the benefit of the government intervention. When I shoot fireworks in the sky, that's offset by the fact that Ben and Jerry cut back on their fireworks. When I give a tax break for charity, that's offset by the fact that I'm giving a bunch of money for free to people who are giving anyway. Those are both government costs.

AUDIENCE: So the crowd out is particularly when we're talking about government provision--

JON GRUBER: Yes, exactly.

AUDIENCE: --the elasticity. We talk about more when they were talking [? about some ?] [? taxes. ?]

JON GRUBER: The elasticity is a way to try to distinguish is marginal-- inframarginal effect. The point is that an elasticity of 0 says that all the effects in for marginal elasticity of infinity.

Imagine there was nothing existing before. Well, then there couldn't be crowd out. And there couldn't be inframarginal effect. Both would be equally effective. Yeah.

AUDIENCE: I think would be worth it to do one of [? United States ?] of [? like ?] different regions of income to see. For example, there is different elasticity that maybe--

JON GRUBER: Great, OK. Great segue to the next topic. Are there other questions about this first? OK, great segue to the next topic, which is, if you go back to our tax chart, we talked about two kinds of tax breaks. Tax deductions. Tax deduction.

Hey, can I get a copy of the handout? Oh, is that it? Thanks.

We talked about two types of tax break. Tax deductions and tax credits. A deduction is something where you get to deduct it from your taxable income. Therefore, a $1 deduction is worth to you 1 minus-- is worth to you ta sense where ta is the tax rate.

So if your tax rate is 50% and allow you to deduct a dollar from your income, that's worth $0.50. A credit is literally subtracted from your tax bill at the end. So a dollar credit is worth a dollar. What is a better thing to use?

Let's say I want to encourage behavior. Should I do it through deduction? We have both in our system. Why? Which is better-- a deduction or a credit? Well, the answer to that depends on exactly the question was asked here.

It depends on two things. For efficiency, it depends on the nature of elasticities. So imagine that people are very elastic on the marginal dollar of giving. So imagine everyone's going to give $1,000 to charity no matter what.

But then beyond that, they're encouraged by a tax break. Then $1,000 credit would be a very bad idea because all it would do would give $1,000. People need the $1,000 anyway. But it would encourage any more giving. There's no encouraging on the margin.

It's like 100% subsidy to the top of the credit, but then it stops. A deduction would continue to encourage that. Let's see where the flip side. Imagine that only people who give a small amount to charity are elastic. And they're really elastic. And people give a lot. Just give it anyway. Then a credit would be a good idea.

You'd be giving a really big encouragement to people to give some amount. But you wouldn't be encouraging people at the margin who are going to give it anyway.

So whether a credit or a deduction is a good idea depends on the shape of the elasticities. If the people who aren't doing much of the activity are more elastic, you want to encourage it through a credit, which giving a lot of money to people who aren't doing anything.

If the people on the-- who are doing a decent amount of the activity are the most elastic, you want deduction because that's encourage them to keep going. So efficiency perspective-- yeah, Steven.

AUDIENCE: Would the credit not good at everyone?

JON GRUBER: Credit would go to everyone. But the point is everyone's getting 1,000 anyway. There's no marginal effect. The marginal effects some encouraging behavior.

If you give $1,000 credit to a population give $1,000 anyway, you haven't encouraged anything. Whereas if you have a deduction, then you encourage them to keep going.

So the question is the big effect the initial giving or keep going? That's the question on efficiency. So on efficiency, it's not clear if a deduction or credit is better. But on equity grounds, it's clear.

For vertical equity, which is a better thing to do-- a deduction or credit? If you think about vertical equity, redistributing from the rich to the poor. Yeah.

AUDIENCE: Credits is [? corporate when you ?] take the standard deduction.

JON GRUBER: Yeah. Well, A because standard deduction. But B because that's one reason. But more importantly, because it's the same amount to everybody, whereas a deduction is worth more the higher your tax rate is. Deductions are regressive. The higher your tax rate is, the more of a deduction you get.

So by giving a deduction, we're giving the biggest tax break to the richest people. So the bottom line is if we care about both vertical equity and efficiency. We should be predisposed to want to use credits instead of deductions, unless you can argue that there's an elasticity shift that the shape of the elasticity is such that deductions make more sense, OK?

So at equity grounds, the answer is clear. On efficiency grounds, it's unclear. I'm throwing some hard shit at you. So don't be afraid to ask questions about this stuff. This is hard stuff today. I'm trying to develop a lot of interesting but hard intuitions. Yeah.

AUDIENCE: In the case of charitable giving where I think it's more likely that wealthier people would give more to charity simply because they can afford to give more, is that a case where deduction probably would make more sense than a credit?

JON GRUBER: Exactly. If the wealthy comes to the question-- if the wealthiest people are the most elastic, then deduction would make the most sense. Indeed, what some are proposed for charitable giving on that very principle, most-- a lot of people said, look, most people give something to charity. But they just give it like they're not paying attention to tax rates. It's the rich.

So maybe they'll propose actually having a deduction, but only on giving above 2% of your income. What's the idea of that? The idea of that is the first 2% people give out of the goodness of their heart, they're going to do it anyway.

Above that, they only do it if there's a tax reason to do it. So that's actually an extreme form of reduction is you're not helping at all the people who are not giving a lot. But you make it a percent of income, so it still--

But so basically, you can set something any way you want. It depends on your theory of where the elasticity is. Yeah. Now, however, the credit runs into another issue, which is one of the most confounding-- not confounding, just frustrating, I would say, issues in tax policy, which is the issue of refundability.

If you go back and remember Jack's tax calculation, he owed $500. But if he'd taken a bigger credit, he would have been owed money by the government.

Many people have argued that if the government-- that if taxes go negative, that is welfare, and we shouldn't be doing that. That is, there's an argument largely in conservative circles that somehow zero is a magic number and that if people owe tax above zero, that's legit.

But once someone actually owes taxes below zero, once their credits take their taxes below zero, then that's welfare. And we shouldn't be doing that. We're just sending money to poor people. And we shouldn't be doing that.

If it seems confusing, it's because it is. It makes no sense. Zero is not a magic number. So in other words, they say if someone goes from paying-- if I give a credit that takes home from 1,000 or 100, great. But it takes them from 100 to negative 300, oh, terrible. We can't do that.

Why? Because somehow there's something magic about the government sending you a check rather than you sending the government a check. Completely nonsensical, but very powerful in political debates, actually.

And in fact, as a result, many tax credits are actually limited in-- you're limited to how you can use them to go negative on your tax-- on your tax burden. There's actually limitations-- I'm getting my term right. I'm forgetting my term for a second. One second. Terminology suck.

Limitation on refundability. OK, there's a long example in the book. We don't have time to go through it. You can read through it in the book. But the bottom line is one of the most important tax credits in our system today is called the child tax credit. The child tax credit is a credit. You get $2,000 per kid.

Well, you do not actually get that if you're poor. If you're poor, they limit how much of it-- how negative your tax can go. And they don't give you all the tax break, which is crazy. So if you're middle class, if you're richer, you get the full $2,000 per kid. But if you're really poor, you don't because it's arbitrarily cut off at zero, which makes no sense at all.

And indeed, part of what the last tax bill-- part of what the American Rescue Plan did was actually make the child tax credit more refundable so that more people could benefit from it lead to a large reduction in child poverty. And that actually, unless action is taken, will expire.

Unless the Trump administration takes action to extend that, that will expire. And many kids who would have benefited from refundable credit will now end up in poverty because this arbitrary notion of zero, OK? So that's just another feature.

Let's put this all together. Table 18-2 lists what's called tax expenditures. What are tax expenditures? These are how much money the government would collect if we had a Haig-Simons tax base.

If we actually didn't allow all these various tax breaks, how much money we collect? For example, the biggest with the federal income tax is lower by $215 billion. The federal income tax, it's another almost 100 billion on payroll tax because we don't tax health insurance premiums. We should.

Haig-Simon say it's a form of compensation. Why aren't we taxing it? We don't do that. That's $214 billion of tax we're not collecting.

We have special tax breaks on capital gains. I'll talk about that later. We have the child credit. You might like that on distributional grounds, but that's costing money. You have to realize that is not free. That is $75 billion we could have used some other way to help poor people. Is it worth it?

There's various exclusions for home sales, cetera. The mortgage interest is 27 billion, cetera. The bottom line is when you put it together, you end up with more than $1 trillion in tax exclusions. What does that mean?

When we collect in the US, something like, $3 and 1/2 to $4 trillion in taxes. That means that as much as a third, we could raise tax collections by 25% to 33% if we got-- if we used the Haig-Simons tax definition.

That's a big deal. And as I will show-- and that's a big deal. And it matters for equity. And it matters for efficiency. And we'll talk about both of those next time, OK? Yeah.

AUDIENCE: On terminology, at tax expenditure is any credit or deduction?

JON GRUBER: Anything which deviates from the Haig-Simons definition, credit or a deduction.

All right, now, last thing from chapter 18. There's just so many issues that get raised. I mean, we always think about tax rates. No one talks about tax base. But there's all these hard issues. Here's another one. How do we treat families?

In most countries, married couples are taxed on their own individual income. In the US, they're taxed on-- were taxed on family income if you report as a married couple. What is the right thing to do? Well, it turns out that's actually really hard, OK?

So let's say that you want to design a tax system with three goals. You want to design a tax system with three goals. Goal one is progressivity. That is you want average tax rates to rise with income. You want average tax rates to rise with income. You want progressivity.

Two is you want across family, horizontal equity. What I mean by that is two families that have the same total income pay the same total tax. That's a second goal. And the third goal is across marriage, horizontal equity.

What I mean by that? I mean that the amount of taxes you pay as a couple should not depend on whether you get married. I mean, if you're living together in marriage, it's a piece of paper. Why should determine how much taxes you pay?

These are three goals one might have for a tax system. It turns out-- and you can guess where I'm going-- it is impossible to simultaneously satisfy all three goals. You cannot have a system that satisfies all three of these goals.

And to see why, let's talk about two couples-- Yasmin and Doug and Jan and Elena. Imagine Yasmin and Doug are a couple where Yasmin earns most of the money, and Doug doesn't earn much. Jan and Elena each earn the same amount. Their total family income is the same, $150,000, just distributed differently.

Imagine we have a tax system of the following form, OK? A 10% rate, the tax rate equals 0.1 on the first 20K and 0.2-- 0.2 up to 20 to 80K and 0.3 80K plus. So it's a progressive tax system. Rising rates. OK, progressive tax system.

If you apply that system-- and you can trust my math here. Or maybe not. You can check it if you like. If you apply that system to each individual income, you get that Yasmin owns $32,000, and Doug owes $10,000. And Jan and Elena each owe $13,000, OK?

Now, let's consider two different tax systems-- one where individuals file on their own. Then in that case, Yasmine and Doug would pay more in taxes than Jan and Elena.

The other is one where you just tax total family income. In that case is their family income's the same. They pay the same. These two systems each violate one of these rules. They're both progressive.

But if you look at this system, if you have an individual tax filing system, that violates rule number two, because we have two families with the same income paying different amounts of taxes. If a family tax system, that violates rule three. Why? Because by getting married, they've changed their tax burdens.

In particular, both families, by getting married, have raised their tax burdens. So that violates across marriage horizontal equity imposes what is often called the marriage tax. Dun, da, da. It's said in those kind of harsh terms, the marriage tax. The notion that by getting married, you're going to pay more in taxes.

Now, the important thing to understand about the marriage tax debate is that there's two different ways of thinking about what the term, marriage tax means. One way is to say, well, gee, a marriage tax exists whenever you pay more tax by getting married. That would be easy to fix. How could we fix that? How could we have a family system with no marriage tax? Yeah.

AUDIENCE: [? A lot even ?] [? filed in ?] [? today's fault ?] issues.

JON GRUBER: No, you'd still pay a tax if you got married if you-- you can file individually. But we're penalize you filing jointly. Married people almost always file jointly and are penalizing you for that. But is a simpler fix. Yeah.

AUDIENCE: Divorce.

JON GRUBER: No, come on. Simpler fix. I don't want to marry this guy. Simpler fix. Yeah.

AUDIENCE: Have a lower tax rate.

JON GRUBER: Yeah, just give more money back to married couples. Let's say in this example, I had a $5,000 marital tax credit. Then in both cases, there would be no marriage tax under that definition. You would save money by getting married.

But that would not meet this definition. It still wouldn't be horizontal. It still wouldn't be equitable because now, married people pay less in taxes. Another way to think about 0.3 is, on average, is there a marriage tax?

The quest is the marriage tax debate about is there any marriage tax? Or on average, there is a marriage tax. Right now in the US on average, we're pretty neutral. On average, because we give a bigger tax break to married couples through the tax system, we're actually pretty neutral. But that means about half the married couples have effectively a marriage tax.

So how do you feel about this debate? Depends basically on how misleading you want to be. If you want to pound things that we should have no 8 tax, we could do that by collecting a lot less tax revenues, give a huge tax break to married couples. And we collect.

We'd have no marriage tax. We just collect a lot less tax revenues. If by that, you mean neutrality, we're pretty close now, because basically married couples, yes, it's true. Their taxable income goes up by getting married. But we also give them a better tax schedule such that they pay less tax. And it offsets. Yeah.

AUDIENCE: What kind of people tend to be facing marriage tax? Does it tend to be wealthier people?

JON GRUBER: Well, if you can look at this example, it's a perfect example. The marriage tax will be bigger the more equal your income is. Why? This is actually an interesting intuition. Why the more equal your income is will your marriage track-- yeah.

AUDIENCE: If the income's not super equal, whoever's making more is already paying more but on the higher rate.

JON GRUBER: Exactly. So basically, the bottom line is, think about Doug's decision to earn more under the individual tax versus the marriage tax. Well, in the marriage tax, if Doug earns more, they are in a range-- their total family income is in a range where their tax rate is 0.3%. Let put it differently.

The bottom line is, if one partner is already rich-- if one partner is already rich, then the second partner going to work is going to be effectively paying a very high rate on that additional income. OK, no, I'm actually explaining-- this is a different question. A different question.

It's bigger just because-- it's because the progressivity. If it was a flat tax rate, it would be the same, because the progressivity, the more equal your income is, the more-- the bigger the marriage checks. I can't think the intuition. But that's the bottom line, OK? So that's how we think about marriage taxes.

Now, let's go back to our definition discussed earlier. Does that mean we shouldn't give a tax break for marriage? Let's say right now, we're neutral. And some company proposes it is unfair. We should give an extra $5,000 deduction for married couples. Is that necessarily wrong? Under what conditions is it right? Yeah.

AUDIENCE: On that, I guess [INAUDIBLE] you'd say like, oh, married couples that [? shoulders ?] on.

JON GRUBER: If there's a positive externality in the marriage, it still might be a good thing to do. So the marriage tax debate has two components. There's a horizontal equity component. But there's also a positive externality component, which is maybe we don't want to penalize marriage because getting married is good. So in some sense, maybe we do want to subsidize marriage. Yeah.

AUDIENCE: Do you know if there's any elasticity of marriage?

JON GRUBER: Well, that's two questions we have to ask. First of all, is marriage elastic with respect to taxes? Second of all, are there positive externalities for marriage? OK, you have to answer both questions. I hope that I'm drilling this. I hope you guys are getting this concept. just like housing.

Well, let's start with the second one. There's actually an enormous amount of non-causal evidence that getting married is good for the world, largely because guys are assholes till they get married.

The bottom line is, I mean, guys, basically when they get married, calm down. They go to work. They become responsible people. And basically that's good for family income. That's good for the kids, cetera.

Now, however, there's not been a great study of the kind we like to rely on in this course that's a lot of causal evidence. But it's a lot suggesting marriage is good for the kids and good for society. I'm willing to try. I think it's a big enough body of evidence. I'm willing to go with that.

There's also a lot of evidence that divorce is bad for kids. So then we comes the question of how elastic is marriage? And the answer is zero, OK, except in timing.

If you get a bigger break for your marriage, people get married before the end of the year so they can get an extra tax break for one year. It's a small tax break. They'll get married after in the new year.

So except for timing, same thing happens with kids, by the way. You get a credit for each kid. So if you have your kid before the end of the year, you get a whole extra year of credit. So if your kid on December 31 verse January 1, you're getting 3,000 more-- 2,000 more dollars by having him on December 31.

Now, I had a kid who was due on January 16. And the doctor said, look, your kid's lungs are not developing properly. We want to deliver the kid on January 2. I said, well, gee, because could you maybe do December 31? And the doctor said, well, we could, but that risked lung development.

And I said, well, OK, fine. We'll do January 2. However, I made a rational decision with respect to the money. I did not make a rational decision with respect to the ridicule I would get from all my colleagues from a planned birth on January 2, thus, failing the basic tenets of economics. So if I countered that ridicule, I might have pushed it back more. Anyway, question.

AUDIENCE: Is there a limit on the amount of kids, like, [INAUDIBLE] like [? over ?] benefits?

JON GRUBER: No, go for it. So he's going to get divorced, have lots of kids. We've determined. OK, so basically, this is-- once again. So we're finishing chapter 18.

But the bottom line is, as we think about tax breaks, we want to think about this basic question of how much behavior you're encouraging. And is it then how much is that versus the inframarginal revenue cost? So that's chapter 18.

Now, we go to chapter 19, which we'll actually go through fairly quickly. I cover this in 14.01. It's pretty rudimentary stuff. So I'm going to go fairly quickly through it. But please, as always, I'm going too fast. Stop me and ask questions.

When we think about taxes, we're going to think about two issues-- fairness or equity and efficiency. Chapter 19 is about equity. Chapter 20 is about efficiency.

Equity, in turn, turns on who actually pays the taxes or the concept of tax incidence. And the motivation for this is FIGURE 19-1, which shows that from 1960 to 2020, we've seen a massive erosion in corporate taxes and a massive increase in social insurance contributions. Basically, we've shifted taxes from corporations to workers.

Now, at first blush, you might say that is horrible. Corporations are rich. Workers aren't. That's terrible for equity. But in fact, you can't conclude that. You can't conclude that because when you think about who bears the tax, you have to remember that markets react to taxes. And that ultimately determines who bears the tax.

So to see this, let's go to example. Let's go to FIGURE 19-2. Let's think about a tax on gasoline. So 19-2, Panel A is the market for gas. You've got the quantity of gas on the x-axis. Price on the y-axis.

Imagine we're initially in equilibrium at 100 billion gallons of gas being sold at $1.50 a gallon. I really do have to update this example, $1.50 a gallon. Now, imagine the government rolls in and says, we are going to tax gas producers $0.50 a gallon.

What does that do? What that does is that raises the marginal cost of producing gas every gallon by $0.50. If the marginal cost, remember, is the supply curve. So that shifts the supply curve upwards and inwards by $0.50. Why? Because supply curve is the marginal willingness to supply and which equals the marginal cost of production.

If that marginal cost also includes another $0.50, you're going to have to get $0.50 more a gallon to sell that. You're no longer going to be willing to sell 100 billion gallons at $1.50. You'll lose money on that.

Now, if you want to sell 100 billion gallons, you're going to need $2. So you move to the new supply curve. What does that do to the price? Well, at that higher supply curve, people want less gas. So you end up in equilibrium at point D with 90 billion gallons being bought at a price of $1.80.

Now, we come to the question, who bears this tax? What is the incidence of this tax? Well, the quick answer would be, well, gee, the suppliers pay the $0.50 a gallon. So they bear the tax. But that would be wrong. Why? Yeah, Alec,

AUDIENCE: Consumers are paying more.

JON GRUBER: Because consumers are paying higher prices and suppliers are getting those higher prices. Yeah, suppliers are sending $0.50 checks to the government for every gallon they sell. But they're also getting $1.80 a gallon. They're getting $0.30 more per gallon.

So in fact, the producer burden is only $0.20. There's a $0.50 check they send minus the $0.30 more a gallon they get in higher prices. Who pays that $0.30? Consumers.

So even though consumers didn't send a check to the government, they are paying $0.30 a gallon in taxes. We have three fundamental rules of tax incidence. Rule one is that statutory burdens do not equal economic burdens, OK?

Statutory burdens do not equal economic burdens. In other words, what people actually bear at the end of the day is related who sends the check to the government, but not determined by it, because the market adjust. And that market adjustment affects who effectively bears the tax.

The economic burden is what people are paying after the market is adjusted. And this is the concept of tax incidence. That is the concept of tax incidence, OK?

Now, that's the first rule of tax incidence. The second rule is that the side of the market is irrelevant. What do I mean by that rule?

I mean that in a well-functioning-- in a perfectly competitive market, it doesn't matter who pays the tax, who sends the check to the government. To see that, let's go to FIGURE 19-3. Now, we're going to have $0.50 tax on gas, but it's going to be a tax on consumers, not producers. So every gallon of gas you buy, you pay $0.50.

What does that do? That lowers my willingness to pay for gas. Why? 2 the old demand curve represented my marginal willingness to pay for a gallon of gas. Now, for every gallon of gas, I'm willing to pay $0.50 less because I'm going to send $0.50 to the government.

So it shifts my demand curve downward and inward by $0.50. Before, I was willing to pay $1.50 for the 100th billion gallon. Now, I'm willing to pay a dollar for the 100 billion. Now, I'm only willing to pay $1.30 for the-- I'm sorry. for 100 billion gallon, only be willing to pay a dollar because I have to send $0.50 to the government.

What does that mean? That demand curve shifts down. We end up in a new equilibrium with a price of $1.30. What is the consumer burden now?

Well, they send a $0.50 check to the government, OK? But they pay a price that's $0.20 lower. So their burden is $0.30.

What is the producer burden? They get a price that's $0.20 lower. So their burden is $0.20. Exactly the same as the previous example.

As long as you've got a perfectly competitive market and the tax is the same, it doesn't matter who you put it on. The market's going to react to deliver the same outcome. The side of the market is irrelevant.

So basically what we have here is a situation where if you've got a given market with a given tax wedge, a given tax, it doesn't matter which side of the market you put it on. The market reacts to end up at the same spot. When it's up at the same spot, burdens end up the same. It's the market response that determines the burdens, OK? Yeah.

AUDIENCE: If you wanted to draw the consumer producer surplus in both cases, then the deadweight loss on the [INAUDIBLE].

JON GRUBER: Right now, we're only talking about fairness, not-- we'll talk about that in chapter 20. We're not going to do any deadweight loss triangles in this chapter.

We're not about efficiency. We're about fairness and who bears the burden, OK? Very important distinction. I'll discuss that a little more in a little bit.

OK, third rule of tax incidence. Elasticities determine incidence. What drives tax incidences relative to elasticities? To see that, let's go to FIGURE 19-4.

Now, let's go back to the tax being on the producer of gasoline-- tax producer gasoline. But let's imagine demand for gasoline is inelastic. People are always going to buy 100 billion gallons of gas no matter what.

Well, in this case, what happens? The price adjusts by the full $0.50. And who bears the entire burden of the tax and why? Someone else. Get some other folks involved. Yeah.

AUDIENCE: [? Make it ?] [? easier. ?]

JON GRUBER: Why?

AUDIENCE: Because they're fully inelastic. So their quantity demanded isn't going to change so that--

JON GRUBER: They're stuck with it.

AUDIENCE: They can pay it.

JON GRUBER: Yeah, well, and also, they don't have a choice. They're stuck with it. So basically, they are stuck paying that price, OK?

However, if you flip it around, imagine, on the other hand, that consumers were perfectly elastic. Then when the supply curve shifts up, you end up with the price not changing. Why? Because you can't change the price. Consumers are perfectly elastic.

So who bears the burden in this case? The producers bear all of it. The bottom line is, the fundamental rule of tax incidence, slippery factors avoid taxes, and stuck factors pay them. More elastic parties avoid taxes. Inelastic parties bear the taxes. It's true on the supply side as well.

Here's how I like to think about it. It's not a clean intuition, but here's how I like to think about it. I think about it like, in some sense, the tax is laid down. You're negotiating over who's going to pay it.

If the consumer's going to buy the gas anyway, you're like, well, fuck you. You're going to buy the gas anyway. You're paying it. If the consumer says, I'm just going to leave you the second you raise the price, then the producer has to bear it.

So basically, the folks-- the party that's stuck is bearing it. The party that can leave is avoiding it. And likewise, on the supply side, OK?

So now armed with that intuition, we can actually derive the formula for tax incidence. Let's derive the formula for tax incidence.

Let's say that we have-- imagine a tax that's paid by consumers. A demand-side tax. Then the final price in the market is the change in price plus the tax. They send the tax to the government, plus, there's any adjustment in price they're going to pay. If price goes up, they'll pay more. If price goes down, they'll pay less.

Now, let's start with some definitions. Remember, the definition is the elasticity of demand. The elasticity of demand is delta Q over delta P. But here is delta P plus tau. This is the change in price.

Delta Q over delta P plus tau times P over Q. And the elasticity of supply is going to be-- the elasticity of supply is just delta Q over delta P times P over Q because it's not the producers not paying the tax.

So we can basically say that we can put these together to say that delta Q over Q-- delta Q over Q equals the elasticity of demand. Just rearranging terms up here, delta Q over Q equals the elasticity of demand times delta P plus tau over P.

That's delta Q over Q equals the elasticity of demand times delta T plus tau over P, OK? What this one, if you rearrange this equation, you get that. If you arrange this equation, you get that delta Q over Q is just A to delta Q over Q is just A to S times delta P over P, OK?

If your range demand, you get this more complicated expression. Supply, you just get that simple expression. Now, delta Q over Q has to equal delta Q over Q. So if we set these expressions equal to each other-- so we can set these two expressions equal to each other.

A to D times delta P plus tau over P equal to A to S times delta P over P. Set them equal to each other. What do you get? You get that delta P, the way the price adjusts in response to a tax, is A to D over A to S minus A to D times the tax.

So the change in price depends on the size of the tax and the relative elasticities. In this case, it's a tax on consumers. So the bigger is the consumer elasticity, the more price will change. In other words, the more price will drop.

The bigger supply elasticity, the more price won't drop. So who gets stuck depends on the battle between these elasticities. If this was a tax on suppliers, this would be A to S in the numerator. Tax supplies be A to S, the numerator but same math.

The bottom line is the relative elasticities that determine who bears the tax. The change in price is the driver who bears the tax. And the change in price is a function of relative elasticities, OK? That math is shown in the appendix.

Let me emphasize one important thing, which comes to the question about efficiency. When we're talking about fairness and tax equity, we are not paying attention to quantities, only prices. We're not talking about the fact that gas went down for 100 billion to 90 billion gallons. That's next chapter. This chapter is just about what happened to prices because that's what drives the fairness.

One other point that I want to make is to remember, we're also ignoring what's done with the money. We're just doing what the tax does. Of course, if you take the money and then spend it on certain people, that could affect winners and losers too.

We're ignoring that. We're assuming the money just gets thrown back. So we're ignoring that. Just important to remember, we're just focusing on what happens when you raise the tax here, OK?

Let's do an example to try to illustrate this a more real world example. Let's talk about the incidence of taxes in the labor market.

So now go to FIGURE 19-7. Just going to drill this through again with a different example. Now, we have the labor market. We've got hours of work on the x-axis. Wages on the y-axis. We're going to impose a tax.

First, we're going to impose a dollar an hour tax on firms. For every hour of labor you employ, we're going to charge you a dollar of tax. What does that do?

I'm sorry. I'm sorry. First, we're doing a tax on workers because workers are suppliers here. I caught myself. Remember, in the labor market, workers, suppliers.

So first, a dollar an hour tax on the workers. For every hour you work, you pay a dollar in tax. That means that you are going to want to supply less labor.

They're going to pay you more to get you to work. You used to be willing to deliver H1 hours at a wage of $7.25. Now, since you're paying tax, you're going to supply-- you're going to need to pay at a higher wage to supply that number of hours, OK?

As a result, we get to a new equilibrium at point B where the wage is 7.75. And the firms and the workers split the burden. How do we see that? Well, remember, the worker's setting a dollar check to the government.

The wage has gone up $0.50. So what's the burden on the worker? $0.50. They send dollar to the government, but they have $0.50 more an hour. What's the burden on the firm? $0.50. They're paying $0.50 more an hour. So that dollar tax is split equally.

Now, why before was it not split equally? In this case it is because of elasticities. That's why last time was 30-20, and this time it's 50-50. Different elasticities in these two examples, OK?

Let's flip it. Let's put the tax on firms. Firms are the demanders here. But the tax on firms who are the demanders. What do you get?

Well, now, you lower the demand for labor. For every hour of worker you employ, you have to pay a dollar in tax. You want fewer workers. Your marginal cost has gone up.

You lower demand for labor. That shifts to a new demand curve, the red curve, and new equilibrium point C with a wage of 6.75 an hour. Now, what are the burdens?

Well, the employer sends a dollar check to the government but pays $0.50 less an hour. So the burden is $0.50. The worker gets $0.50 less an hour. The burden is $0.50.

So the second rule is held, OK? Question about that example? Now, I'm blow your minds. You ready for this? What if there's a minimum wage? Let's go to the next figure.

What if there's a minimum wage at 7.25, the federal minimum wage? Well, in the first case, it doesn't matter. The same thing happens. You put the tax on workers. They supply less labor. The supply curve shifts up. Wages rise to 7.75 an hour is $0.50 burden on each.

But what about the second case? What's changed? What's changed is the employer can no longer lower the wage to avoid the burden. Because the minimum wage is there, the employer has to pay at least 7.25.

So what you see is the wage remains at 7.25. The employer bears the whole burden. You get a lot fewer workers. We'll come back to efficiency. We're not talking about efficiency right now. We're just talking about fairness.

So the side of the market being irrelevant is only in a perfectly competitive market with no impediments. What is impediments in the market? The side of the market is no longer relevant and the application of how we think about this, OK?

But once again, the main thing is to realize that essentially, the main thing is to realize that basically what's going on is that you really care about how price adjusts. That's what's going to drive the economic burden is how price adjust, OK? Yeah.

AUDIENCE: [? You said ?] [? blank ?] [? by a ?] [? reduction ?] 8.25 again?

JON GRUBER: Oh, why this goes up to 8.25? Because no, the wages go up to 8.25. The firm has to pay 25 because they have to pay 7.25 an hour plus a dollar in taxes.

The equilibrium wage stays at 7.25. The firm just has to pay. It shouldn't say W2, actually. Yeah, that's a typo. That's not really a wage. That's a good point. We should fix that.

No, that's a good catch. It shouldn't say W2. It should say 8.25. 8.25 is what the firm ends up paying because they pay 7.25 an hour for workers plus a dollar in tax. But that shouldn't say wage. OK? Good catch. Other questions?

OK, now, let's make things harder. Let's recognize that taxes on a given good are not levied in a vacuum that there's economic systems at work. And we need to consider the concept of what we call general equilibrium tax incidence, which accounts for the fact that a tax in one market may affect other markets.

And to see this, let's go to specific example. Imagine that Bozeman, Montana-- Bozeman, Montana is a big, touristy, beautiful town. Imagine town of Bozeman, Montana decides they're going to put a tax on restaurants in their town.

Therefore, every restaurant meal sold, the restaurant's going to have to pay a dollar tax, because they figure it's a good way to raise money. There's a lot of tourists in Bozeman. They'll raise money this way.

What is the incidence of that? Well, let's assume that the demand for restaurant meals in Bozeman is perfectly elastic. Why is that not a bad assumption? Why do we think it'll at least be very highly elastic? Yeah.

AUDIENCE: It's pretty easy to substitute a restaurant meal for a non-restaurant.

JON GRUBER: Yeah, or to go to the next town over. You can go to the next town over to Bozeman. You can eat at home. Nothing's perfectly elastic, but it's probably pretty darn elastic.

So to make life easy, let's assume it's perfectly elastic. In that case, who bears the burden of the tax? Someone else. Yeah.

AUDIENCE: Tourist.

JON GRUBER: The what?

AUDIENCE: Tourists.

JON GRUBER: Nope. Who bears the burden? Because they don't bear the-- because why-- how can they avoid the tax? They can avoid it because they can go to the next town over.

The firm bears it all. The restaurant bears it all because he can't charge the tourists anymore. He has to charge them the same $20. So therefore, he has to pay the whole tax, OK? So the firm has to pay the whole tax.

So we're done, except we're not done. What does it mean for a firm to pay a tax? A firm is not a thing. A firm's like, basically we know 14.01. What's a firm? It's agglomeration of factors.

So we say a firm pays a tax. That means the factors that underlie that firm pay the tax. So we have to actually take another step and ask, well, wait a second. What does this do to the factors that make up the restaurant? They're in markets too.

For example, what does this do to restaurant workers in Bozeman? Well, before we go to the next graph, think about it for a second. Think about a labor market graph for restaurant workers in Bozeman-- demand and supply curves.

How would those curves going to shift? Only one that's going to shift and why. What's going to shift? Think about a market for labor in Bozeman. What's going to happen? Yeah.

AUDIENCE: Demand's going to shift down.

JON GRUBER: Down. Why? Because people don't want it. Because basically, restaurants can't serve as many meals, OK. So demand is going to shift down. Indeed you see that.

Let's now go to FIGURE 19-10, panel (a). This is the market for labor and restaurants in Bozeman. The demand curve, the downward sloping demand curve shifts inward. But what is supply curve for workers at restaurants in Bozeman?

Well, it's probably pretty darn elastic, right? They can work at the hardware store instead. They can work at the next town over. So they're going to have a pretty elastic supply curve. So who's going to bear this tax? Who's going to bear this tax. Yeah.

AUDIENCE: The owner?

JON GRUBER: The restaurants. The workers are not going to bear it. We know that because they can avoid it because they're slippery. They're elastic. Well, if they don't bear it, who does? Well, what's left? Firms are labor and capital.

So let's ask, what about the market for capital to restaurants in Bozeman, Montana? What does that mean? Think of it as like, think of all restaurants as pizzeria, and the capital is the brick ovens. Basically, what is going to happen is the demand for brick oven are going to fall.

But the brick ovens are already there. They're already made. They're inelastic, so they are stuck. So who bears the incidence of this tax is the owners, the capitalists, the guys who build the brick ovens. Yeah.

AUDIENCE: What about the food and the actual variable cost factor?

JON GRUBER: We don't have that in our model, right? We just have labor and capital. If there was food, you'd have to ask how elastic that is. So basically, the bottom line is in this simple example, we basically said, look, this is what's fascinating with general tax instances.

A tax on restaurants ends up hurting the restaurant owners. Well, that makes sense. But that doesn't have to be. For example, imagine a world with these elasticities were changed.

You can end up with very different burden sharing if these elasticities change. So for example, let's change this. Let's make it so that the tax is on restaurants in Montana.

Imagine a dollar tax on restaurants in Montana. Well, how would that change the analysis? Let's go back to FIGURE 19-9.

The demand will not be as elastic for restaurants on Montana as it is for restaurants in Bozeman, because you have to go far to a substitute. It's still elastic somewhat because you can eat it at home. But it's less elastic.

What does that mean in terms of who's going to bear the burden? How is this going to change the analysis if restaurant demand is less elastic? Yeah.

AUDIENCE: It will be shared by the restaurant and by the people.

JON GRUBER: Yeah, the consumers will now bear some of the burden. So it'll be less to shift. So first of all, the burden, instead of being entirely shift to labor and capital, some of it will drop off on the-- some, it's going to drop off on the consumers.

Now, it's going to labor supply side. Let's go to FIGURE 19-11, the first panel. How is that going to change with the tax on restaurants in Montana? How's this graph going to change? What's it mean in particular for the supply of labor, the labor supply curve? Yeah.

AUDIENCE: The supply will be less elastic because workers won't be able to move to--

JON GRUBER: Exactly. The supply will be less elastic because it's harder to leave Montana to go work in a restaurant. This will be the next one over. Well, supply is less elastic. That means the workers are going to bear some of the burden. And then what's left over is born by the capitalists.

So the bottom line is ta-- general equilibrium tax incidence is a game of follow the burden. Basically, you want to follow who is getting stuck at every level. Basically at every level, you want to look at who's elastic? Who's not elastic? And how's that burden shared along the way. Yeah.

AUDIENCE: How did you work elastic capital supply into this?

JON GRUBER: One second, OK? So you're going to look at how that burden is shared along the way, OK?

Now, let's do a different example. Tax in Bozeman. But we're not thinking about the incidence now. We're thinking about the incidence over the next five years.

So it's just in Bozeman. So FIGURE 19-10 doesn't change. Demand's perfectly elastic. FIGURE 19-11A doesn't change. But FIGURE 19-11B changes. Why? Because over time, capital becomes elastic.

Think about what capital is in a restaurant. Its upkeep. Its continued investment. People stop investing in restaurants over time. So in the short run, your money is stuck in the brick oven. But in the long run, all that money you would have put into improving your brick oven, you take elsewhere.

So capital is also elastic in the long run. So capitalism gets stuck. What the hell happens now? Consumers aren't getting stuck with it. Workers aren't getting stuck with it. Capital is not getting stuck with it. What's left?

What's the ultimate inelastic factor? What's the thing that literally you cannot change? It's in a fixed supply. Yeah.

AUDIENCE: The land.

JON GRUBER: The land. The landowners are the ultimate stuck factor. Restaurants rent from landowners.

In the long run, the restaurants just say, I don't want to be in Bozeman anymore. That will lower rents. And the landowners are the ones that get stuck. So I cheated a bit on your intermediate goods because I did add an extra factor-- added land.

The point is, land is the ultimate stuck factor. So in the long run, [? land bears the ?] [? incidence. ?] So here's fascinating. We put a tax on pizza meals. And the landlords of Bozeman end up bearing it. That's what's fun about general income tax incidence.

It's fun. Come on. It's a fun puzzle. Where at MIT, it wouldn't be fun if we were at Harvard. But it's fun at MIT, which is basically it's a fun puzzle to follow the burden on where it ultimately lands, OK?

And once again, you can consider all sorts of different factors. For example, there's also product market spillovers. If we tax restaurant meals, what other effect will it have?

What effect will that have, for example, in the market for-- what will that happen in the market for groceries? If we tax restaurant meals, what happens? Yeah.

AUDIENCE: Demand curve.

JON GRUBER: Demand will increase. Prices will go up. And people eat at home will bear some of the tax. Think about that. If I tax restaurant meals, people who buy at the supermarket bear some of it because demand for groceries go up. So prices go up.

What about babysitters? How are they affected? How's that market affected? Yeah.

AUDIENCE: Demand probably goes down.

JON GRUBER: People go out less. Demand goes down. Babysitters bear some of the tax.

The point is, if you want to be picky, every tax is born by everyone, OK? This is where general taxes gets tough is you have to stop at some point. And we will not leave it up to you as to where to stop. I don't want you spending eight pages in your exam writing out every possible market that's affected. We'll give you more guidance than that.

But the bottom line is we come back to the introduction of this chapter, which was, gee, isn't it terrible that corporations are paying less tax and people are paying more? Not necessarily. It depends on how the market adjusts.

Indeed, we'll talk about the Trump corporate tax cuts in chapter 24. But the theory behind the corporate tax cuts, the massive corporate tax cuts that we saw in 2018 was that it would raise wages. They might say, well, that's stupid. How could cutting corporate tax raise wages? Not stupid at all.

If you think capital is perfectly elastic in the long run, then cutting corporate wages benefits workers. It doesn't affect capitalists. They move to get the same rate of return no matter what. But workers are going to get higher wages. So it's not a crazy concept at all.

So ultimately, tax incidence is about how the market responds. Where does that leave us? Well, there's actually fundamental analysis. I just want to pound through this in the last couple of minutes.

There's really interesting analysis of who bears taxes and what it means. Basically, the common assumption is, taxes on workers are born by workers because labor supply is largely inelastic. Taxes on capitalists are shared between capitalists and workers because capital is more elastic, so they avoid some of the taxes. That's the summary, rough way that we do tax incidence. That's the assumption.

We'll come back to whether those assumptions are reasonable. But that's basically the way that tax incidence is done is they say taxes on workers are born by workers. Tax on firms are shared.

Put that together, what does that mean for the distribution of taxes? Well, let's go to TABLE 19-1. TABLE 19-1 shows effective tax rates-- effective tax rates, which means taxes paid over income. These are average tax rates.

What you see is that on all household, the average tax rate has fallen over time. Tax rates have fallen in the US. But it's fallen a lot more at the bottom than it has at the top.

So basically, total effective tax rates are actually pretty constant at the top and have fallen a lot at the bottom, which is interesting. So that says if you look at it that way, you say, gee, that seems pretty fair. We basically cut tax at the bottom and not raised them at the top.

What that doesn't account for is the fact that income itself has changed. So if you go to the next table, this shows what happens to the share of income and the share of tax liabilities.

The top quintile over time has seen their share of income rise from 46% to 55%. Their share of taxes rise 55%, 69%. That seems pretty comparable. Indeed, the top 1% has seen their share of income double and the share of taxes double.

The poor have actually seen their share of income fall a bit and the share of taxes fall a lot. So the bottom line is, when you look at these numbers, it looks like the tax system, overall, has stayed roughly equal, neutral distributionally or if anything gotten a little more progressive overall. But different tax cuts have different kinds of effects. And we'll come back to that as we talk about specific tax cuts, OK?

There's a lot to process in one lecture. Get back to me if you have questions. We'll cover more of this in section on Friday.