MARGINAL RATES AND EFFECTIVE RATES

What they are, and why they are important

My way of making marginal and effective rates a little easier to understand is to use a system of imaginary income tax rates. Like the rates in section 1 of the Code they will be "graduated" or "progressive", which means that the rates will increase as income goes up. These rates will be different from those in section 1 only in that they will be a little more simple numerically.

The rate of tax on all income up to $10,000 will be ten percent (10%). The tax on a total income of five thousand dollars will be five hundred dollars; the tax on a total income of ten thousand dollars will be one thousand dollars.

If this tax system were "proportional", the rate would stay at ten percent no matter how high a taxpayer's income. When a tax is "proportional", the dollar amount of the tax goes up as income goes up, but the percentage of income taken stays the same. Our imaginary legislature is a liberal one and wants a progressive or graduated tax, so it provides that the rate of tax on income above ten thousand up to twenty thousand shall be twenty percent (20%). Then, to add still more progressivity, it makes the rate of tax thirty percent (30%) on all income above twenty thousand

In diagram form it looks like

(Figure One -- see next page)

In diagram form it looks like this:

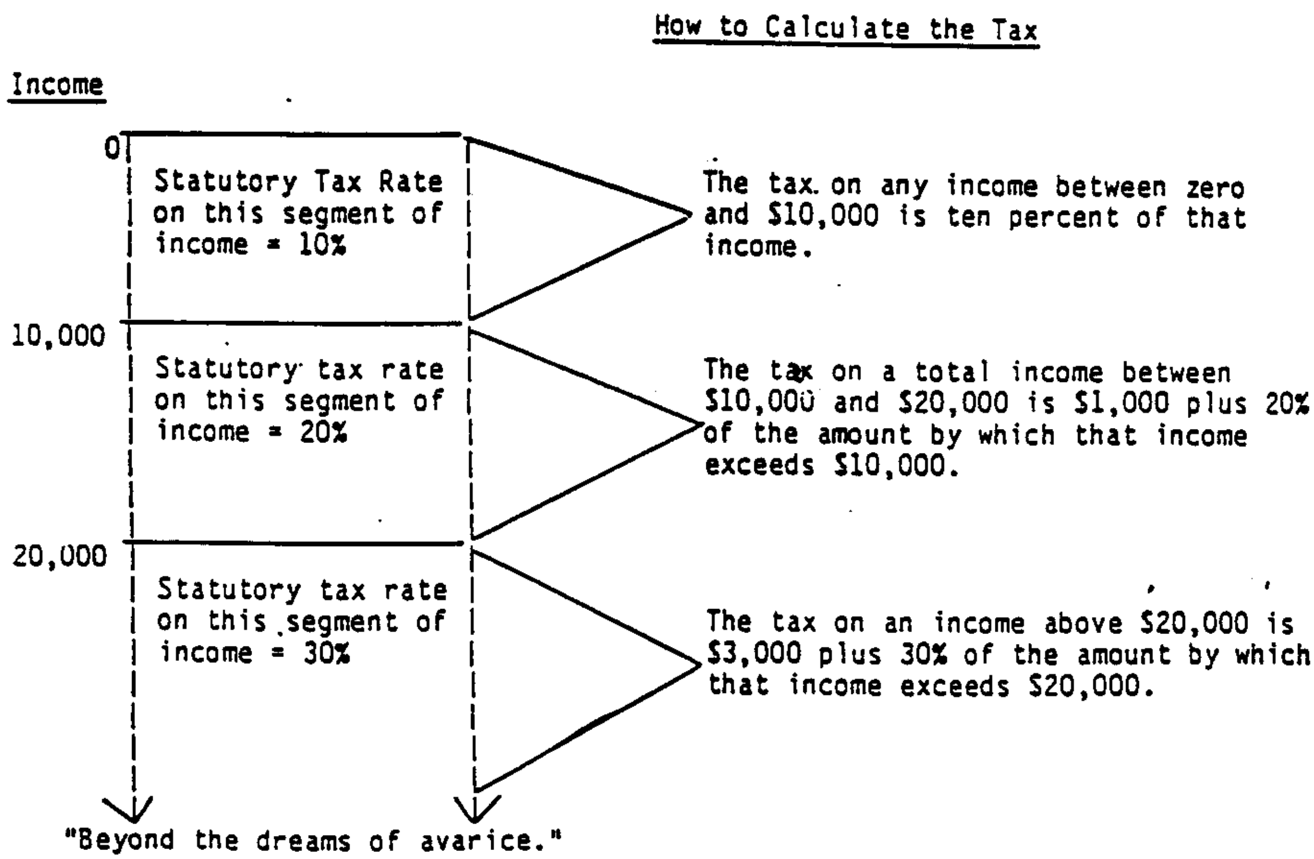


Figure One

A client might ask you several different questions about how this system applies to her. She might say that her income is $10,000, and that she has the chance to take a new job which will pay $13,000 and that she wants to know how much extra tax she will have to pay. When a person wants to know about the effect of a change in income, up or down, then she is asking about what we call marginal rates. Her change in income is called her marginal income ($3,000 here) and the extra tax it brings is called the marginal tax. The marginal tax here is obviously twenty percent of three thousand or six hundred dollars. The marginal rate of tax on her extra three thousand is twenty percent: every extra dollar she earns above her present income will be taxed at twenty percent. (When you see the word "rate", it means division. For example, rate of speed is distance traveled divided by the time it takes. In income taxation "tax rate" means dividing a tax by the amount of income being taxed.)

The only trouble with this example is its triviality. It's too easy. So on we go to a more likely and more difficult set of numbers.

Your next client tells you that he has a chance to increase his present income from nine thousand to twenty-three thousand dollars. The change in her income ("marginal" income) will be fourteen thousand. The change in her tax ("marginal" tax) will be from nine hundred dollars to thirty-nine hundred dollars, or three thousand dollars. Her increase in income of fourteen thousand dollars will bring with it an increase of tax of three thousand dollars. Now she asks, "How much of each dollar of my change in income will be taken by an increase in tax?" or "What percentage of my change in income will be taxed away by the change in tax that comes with it?" The answer is

change in tax $3,000 = **21.4%**

change in income $14,000.

This percentage (**21.4%**) is called the marginal rate of tax.

In this example, there were many steps and computations. Here are questions and answers about each step.

1. "How do I know the tax on twenty-three thousand dollars is thirty-nine hundred dollars?"

2. One way is by using the words on the right side of the picture in Figure One (the tax on twenty-three thousand is three thousand plus thirty percent of three thousand which means three thousand plus nine hundred for a total of thirty-nine hundred). Note that section 1 of the Internal Revenue Code uses similar language.

3. "<u>Who says the language to the right of the diagram is correct? Where did it come from?</u>"

It came from adding up the tax imposed on each lower layer of income by the rate provided for that lower layer. In particular, the tax on twenty thousand is $3,000 because it is the sum of (1) the tax on the first $10,000 (1,000, or 10% of ten thousand) and (2) the tax on the income from $10,000 to $20,000 ($2,000, or 20% of ten

Here is a picture of that computation, in which we find the tax on taxable income of $23,000:

(Figure two – see next page)

"<u>How do you compute the marginal tax, that is, the change in tax that accompanies a change in income</u>?"

In the first example it was very easy because the change from 10,000 to 13,000 all took place inside the 20% bracket. So the change in tax was just 20% of the $3,000 change in income. In a system with many marginal rates, a change in income is less likely to take place all in one "box": it will cross at least one of the lines separating the boxes. That means that some of the increased income will be taxed at one marginal rate, some at another. That's what happened when income went from $9,000 to $23,000 in our example. Until the 1986 Act, Code section 1 provided for fifteen marginal rates. In 1988, it provided for just two. Look at section 1 in your Code book: how many marginal rates (brackets) do we have now?

Whether most or only some changes in income cross a line separating marginal rates, you should know the general solution to the problem of calculating the marginal rate of tax on a change in income. It is: calculate the tax before the change in income, and the tax after the change in income (in our "hard" example those numbers were nine hundred and thirty-nine hundred). Then take the difference between them by subtraction and you have the <u>change</u> in tax. Divide it by the change in income and you have the marginal rate..

4. "<u>Even after I've computed the change in tax that goes along with the change in income, how do I get the marginal rate?</u>"

By dividing the change in tax by the change in income. If you get a number above 100%, you did it upside down: you divided the change in tax into the change in income.

Here is a picture of that computation, in which we find the tax on taxable income of $23,000:

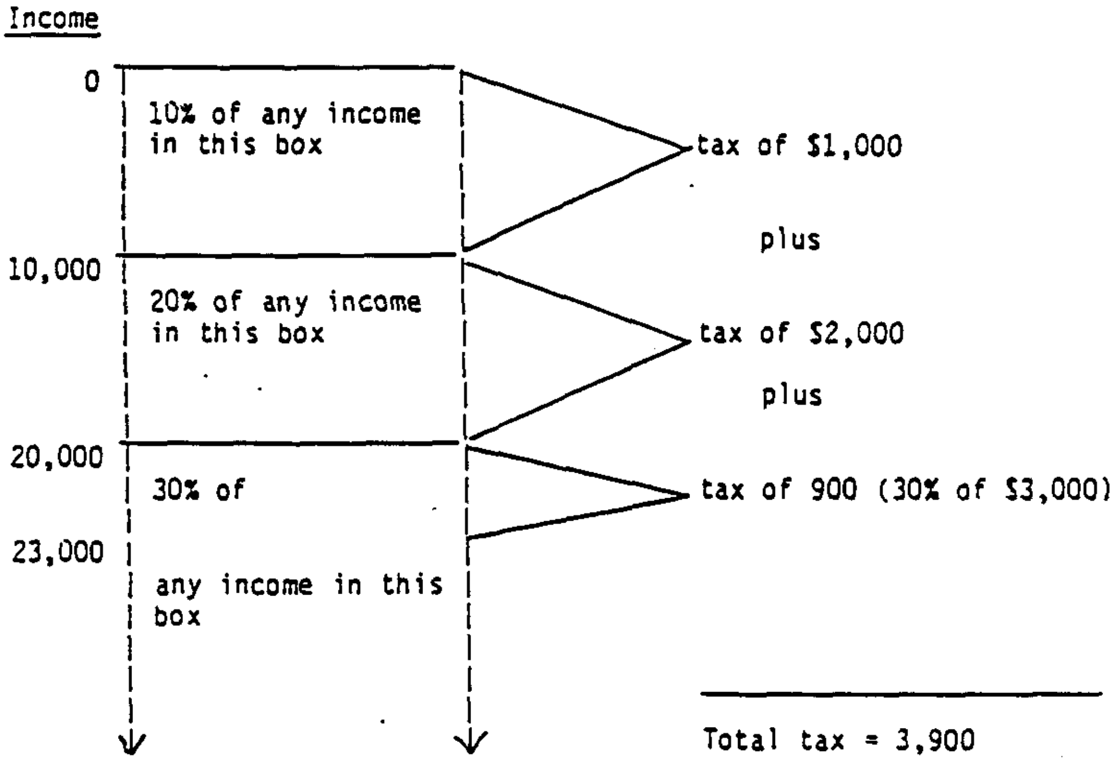


Figure Two - How Figure One was Constructed

5. "<u>Now that I have the 'marginal rate', who cares? Why am I doing this? Why didn't I just tell my client not to ask stupid questions?</u>"

Because you know that your client's question was a normal one. A person deciding whether to try to increase his income (perhaps deciding whether to work overtime, or to make a risky investment in the hope of increased income) will take into account not the rate of tax on income already received but the rate of tax on the extra income which additional work or investment will bring. In our second example the ten per cent rate of tax on the first nine thousand of income is not what the taxpayer needs to know in deciding whether to make the sacrifices necessary to get that additional $14,000. If you are that taxpayer's lawyer you are going to have to explain that the government will take 21.4% of that extra fourteen thousand.

An economist would say it this way. "To find out how a tax will change a person's behavior, watch what is happening at the margin." On the other hand, economists' language usually makes things more clear only to other economists.

<u>Another concept: "effective rate" of tax</u>

The "effective rate" is a more simple concept. It's just all the taxpayer's tax divided by all the taxpayer's income. The effective rate (as against marginal rate) of tax on $20,000 is in our imaginary system $3,000 divided by $20,000, or 15%. The key to understanding where the effective rate came from is that the effective rate is just the average of the marginal rates applied to the taxpayers several layers of income.

You can and should now turn to Section 1 of the Code, and see that it is constructed in the same way as the make-believe tax law in our example. But since the numbers in Section 1 are less easy, your life will be more pleasant if you use a pocket calculator. (There are several places in this course where a simple pocket calculator, which costs less than ten dollars, will save you a lot of time. It will also enable you to understand the statute by making up hypothetical cases and solving them under varying assumptions because the arithmetic will be no barrier.)

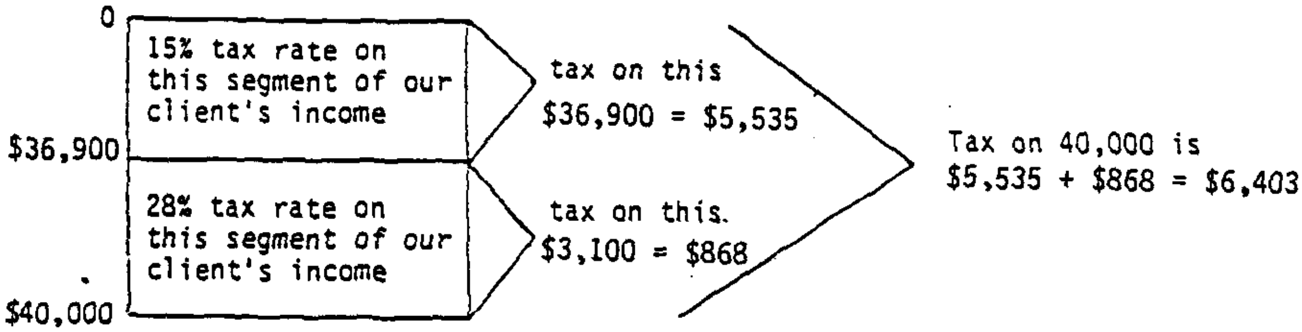
As an example under Code Section 1(a) the tax on a married couple with a taxable income for 1999 of $36,900 is $5,535 (15% of $36,900).(The calculation is illustrated in Figure Three). The rate of tax on dollars above $36,900 is 28%. (This is a marginal rate: it applies only to income above $36,900.) The tax on an income of $40,000 would be $5,535 plus 28% of $3,100 ($40,000 minus $36,900), or $5,535 plus $868 for a total tax of $6,403. The effective rate on $40,000 of taxable income is $6,403 divided by $40,000, or about 16%. It is a kind of average of the 15% and 28% marginal rates that were applied to the different layers of income that made up the $40,000, with the 15% having more weight because it applies to more of the income.

(Figure Three – see next page)

Marginal Rates and Deductions

So far we have been talking about marginal rates on increases in income. This system works in reverse gear, too. Suppose your client asks how much he will reduce his tax if he is allowed to deduct a certain expenditure, or allowed to exclude a certain receipt from income, or simply works fewer hours and has less income than last year. Lets go back to our original hypothetical tax system. Now our taxpayer has a taxable income of $13,000. He is thinking of making a charitable contribution of $3,000, which you assure him he can deduct. How much will the deduction reduce his tax? The way to get the answer is to compute the tax on $13,000 ($1,600 in our imaginary system) and then the tax on $10,000 (his taxable income after the deduction). The latter is $1,000, so the deduction of $3,000 will reduce his tax by $600. This is just the exercise we went through when he asked us what would happen if he increased his income from $10,000 to $13,000, but now we are looking at a decrease instead of an increase. Remember that his marginal rate was twenty percent? Notice that his tax saving of $600 is twenty percent of the $3,000 deduction he will take. *The tax saving from a deduction is the marginal rate of tax times the amount deducted.*

Taxable Income



The effective rate of tax on \$40,000 $= \dfrac{\overset{\text{(tax)}}{6{,}403.00}}{\underset{\text{(taxable income)}}{40{,}000.00}} = 16\%$

Figure Three uses rates for 1991 Code §1(a)

Figure Three

Marginal and effective rates in making public policy

So far, we've been taking the view of the practicing lawyer. Marginal and effective rates are also very important in debates about what the tax law ought to be. If you want to know the comparative tax burdens of people in different income classes, you would be asking for the effective rate of tax on each income class. If for example, the average tax paid by a person with an income of $50,000 were $10,000 (20%), while the average tax paid by a person with an income of $20,000 were $3,500 (17.5%), you would then know that the tax system was "progressive", but not by very much. If the average tax paid by a person with an income of $20,000 were $4,000 (20%) we would know that the tax system was not progressive but proportional. If the effective rate of tax on the lower income were 21%, the system would be "regressive."

Comparing effective rates of tax on different income classes is the basic method of figuring out the progressivity of the system. It also tells whether a proposed change (allowing a new deduction) will be progressive, regressive or proportional. You would compare effective rates before the change and after for different income groups to answer this question. More tax lingo: the question of how the tax law (or any particular part of it) allocates the tax burden between people with different incomes is called the question of "vertical equity."

Effective rates answer another question -- are taxpayers with the same incomes paying the same tax? (We call this the question of, you guessed it, "horizontal equity".) For example, in our tax law deductions allowed to homeowners but not renters mean that two persons with the same income pay different amounts of federal income tax if one owns and the other rents a house or apartment. The amount of the difference is found by computing the effective rate for each group, or the effective rate for each group by income

Marginal rates are important in thinking about public policy, but in a different way. Some people believe that high marginal rates are a disincentive to work and to invest, and that the way to get individuals and business firms to do whatever Congress would like them to do is to give tax incentives (lower marginal rates) to those who take the bait. (There is a short, good paragraph about this in your casebook, at p. 27.) Public debate about income taxation usually includes questions of tax incentives and disincentives, which means discussion of appropriate marginal rates. One argument made for the drastic reduction in marginal rates that Congress enacted in 1986 was that people respond to high marginal rates by trying to find ways (legal and illegal) to avoid tax, instead of engaging in more useful activities.

Marginal rates are what we ask about when the question is whether tax will or should or can change people's behavior. Effective rates tell us more about distribution of the tax burden.

<u>Warning.</u>

There is one mistake about this subject which is easy to make. In our make-believe system of rates, the taxpayer whose income increased from $10,000 to $20,000 was heavily taxed on the increase in income, but there was no increase in tax on his first $10,000. The taxpayer could rightly say "Now I am in the 20% bracket" or "The second $10,000 pushed me into a higher bracket", but this means that twenty percent of extra dollars above $10,000 go to the government, not that the first $10,000 is taxed at 20%, or anything but 10%. In the same way, you can use Figure 3 to see that a taxpayer whose income went from $3,000 to $25,000 would always be better off, even after taxes.

This is true of deductible expenses, too. A deductible loss or a fall in income never make the taxpayer better off. If a person had an income of $20,000, and suffered a deductible loss of $10,000 (or just had fewer opportunities to make money in the next year), that person's income tax would drop (in our hypothetical system) from $3,000 to $1,000, a tax reduction of $2,000. The tax reduction will be a welcome band aid, but he is still $8,000 less well off. Only if the marginal rate had been above one hundred percent would it be better to lose money and deduct it than to have it and be taxed on it.

It's the mark of a beginner to say that a person might want to avoid an extra item of income because moving into a new, higher bracket might make the increase in tax more than the increase in income. (It's just as bad to say that a taxpayer is happy to have a loss because she can use the deduction.) In a lawyer, it would be malpractice to give such advice. If you feel the urge to say it, bite your tongue. Then go to Section 1 of the Code. Find your client's present taxable income and the tax on it. Find the tax on his income including his new, extra income (or after deducting his loss). Take the change in tax (the "marginal tax") and divide it by the change in income. You will see that the increase in income made the taxpayer better off after taxes, which is to say that the marginal tax rate never reaches 100%. Indeed, today it goes no higher than 39.6 percent.

Dan Schaffer

August, 1999