Tax incidence

Tax fairness

(Note: Gruber is very idiosyncratic (in a bad way) on some of those tax issues. Ignore.)

Incidence of unit taxes.

-- tax on commodity

-- tax on factor

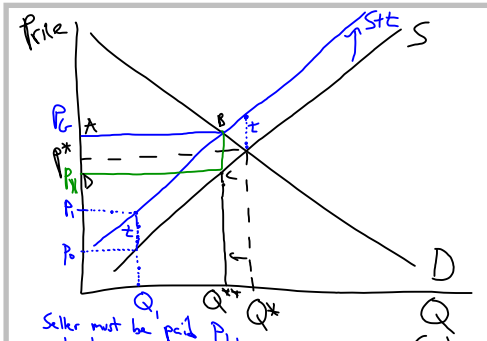
Incidence of ad valorem taxes

-- " " } same principles,

-- " " } different pictures.

General equilibrium incidence

(Do that later. We want to get to fairness)



Seller must be paid P_1, to keep P_0 and supply Q_1.

Government imposes unit tax on gasoline. Seller gathers the money and sends it to the government.

Creates a wedge between <u>what the buyer pays</u> and <u>what the seller keeps</u>.

$\boxed{\text{Gross price}}$

$\boxed{\text{Net price.}}$

How do we find the equilibrium gross and net price?

We have the info. we need, willingness to pay and willingness to supply, to get the answer.

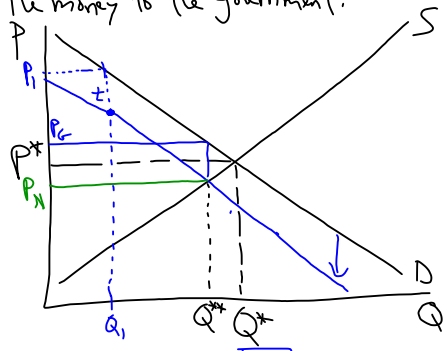
Once tax imposed, supplier "willingness to supply" given by S+t.

$\Rightarrow$ Excess demand at Q^*.

$\Rightarrow$ Gross price gets bid up.

New equilibrium quantity is Q^{**},
equilibrium gross price is P_G,
equilibrium net price is P_N.

Suppose instead the buyer sends the money to the government.



I'm willing to pay a $\boxed{\text{total}}$ of P_1 for the Q_1 unit (last unit). This now has two components, what the <u>seller keeps</u> (P_N) and money sent to the government.

I won't demand Q_1 units at net price P_1 anymore, I'll demand Q_1 units at net price $P_1 - t$.

At price P_G, utility maximizing quantity of demand is Q^{**}

At price P_N, profit maximizing quantity of supply is Q^{**}.

$\Rightarrow$ Q^{**} and P_G and P_N are the same here as before. Pure accounting. Linearity is irrelevant, all rests on price taking behavior.

One thing about social security tax is 7.65% on employer and employee. Irrelevant!

"Incidence on buyer" = $P_G - P^*$

"Incidence on seller" = $P^* - P_N$

(per unit).

Factor taxes, just note that supply (of labor) is individuals, demand (for labor) is from firms.

$\Longrightarrow$ Buyer is firm, it is paying the gross price.

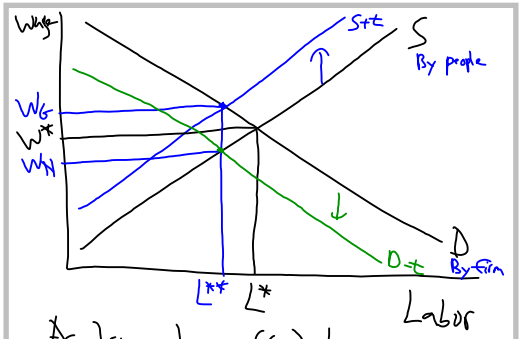
Seller is individual worker, she keeps the net price.

For $U(C,\lambda)$, leisure/consumption model, the <u>wage</u> here is the net wage (net price).

$$\max_{C,\lambda} U(C,\lambda)$$

$$\text{Subject to } C = \underbrace{(2{,}000-\lambda)}_{\text{labor supply}} \underbrace{W_N}_{\text{supply curve of labor}}$$

For firms, $\max_{K,L} P \cdot Q - r_G \cdot K - \underbrace{W_G}_{\text{Demand Curve}} \cdot L$



As drawn, buyer (firm) demands L^{**} when it pays W_G for each unit of labor. Seller supplies L^{**} when she keeps W_N per unit (is paid W_G and sends t on each unit to the government).

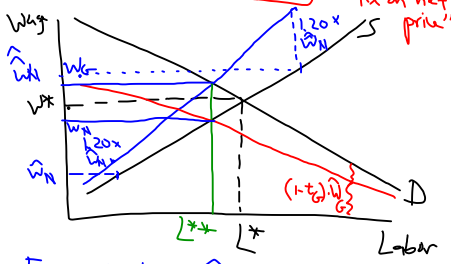
Ad valorem tax, on each unit it isn't a constant, but is a function of the price.

How payroll tax works:

$$W_N = W_G - t \quad \text{(unit tax)}$$

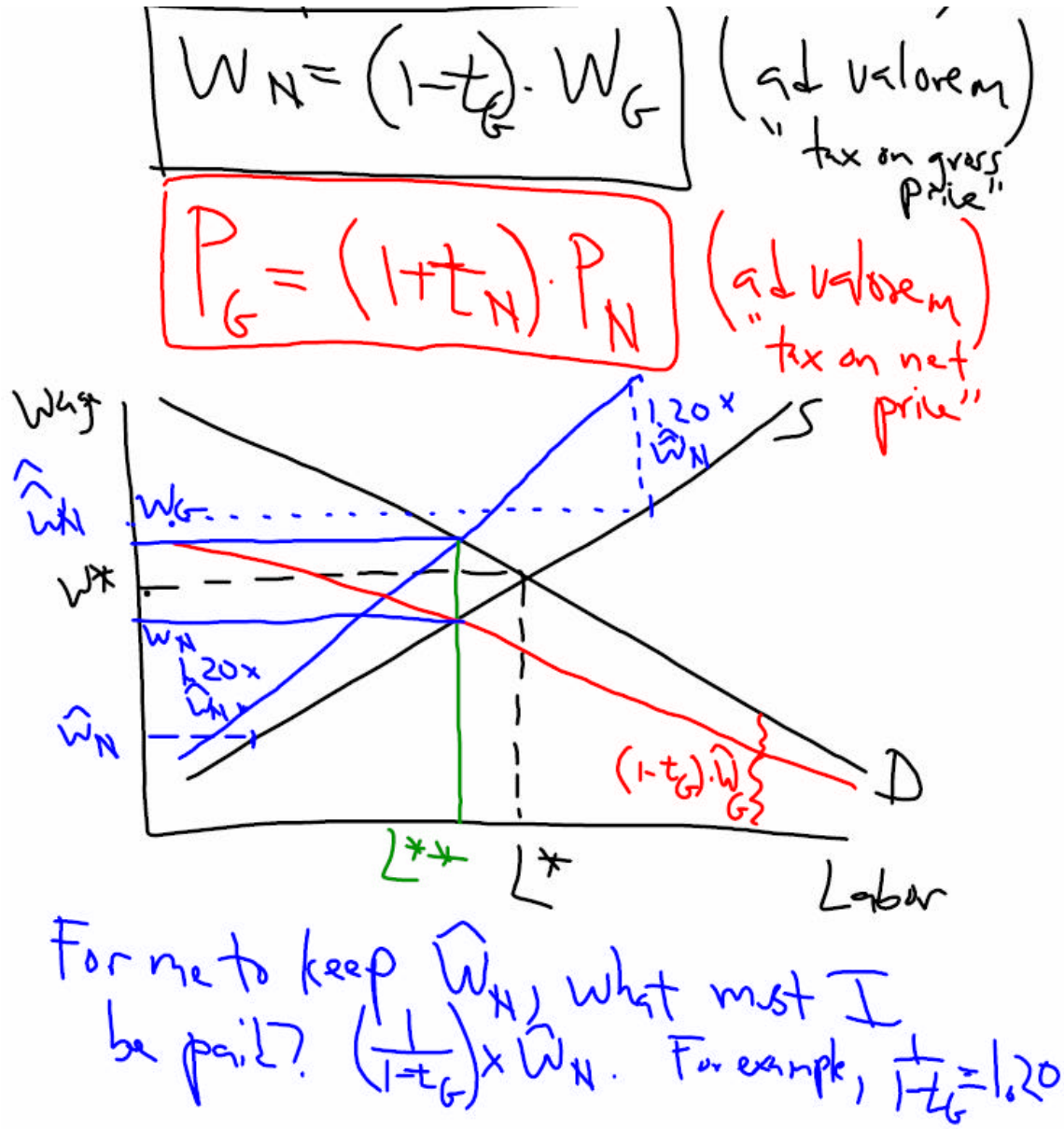
$$\boxed{W_N = (1-t_G)\cdot W_G} \quad \text{(ad valorem "tax on gross price")}$$

$$\boxed{P_G = (1+t_N)\cdot P_N} \quad \text{(ad valorem "tax on net price")}$$



For me to keep $\hat{W}_N$, what must I be paid? $\left(\frac{1}{1-t_G}\right)\times \hat{W}_N$. For example, $\frac{1}{1-t_G} = 1.20$

Here's a blowup of the last part of the previous page and a little more explanation.



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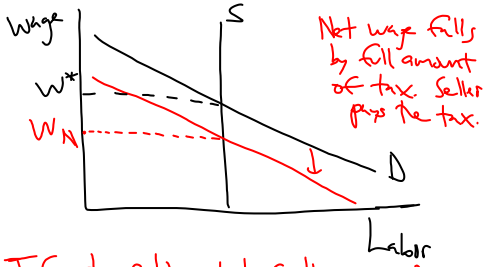
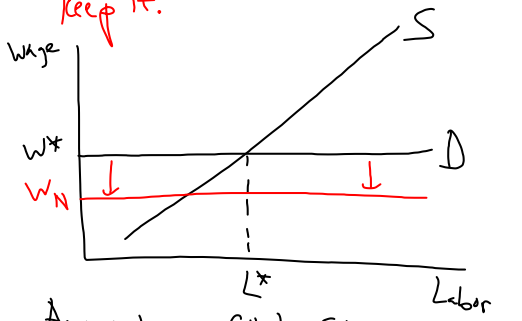
(Assume a "hat" on all "w" here!!).
Suppose the firm pays the tax. Then the firm's willingness to pay for the last unit of labor is w_G, but the seller keeps only $(1-t_G)w_G$. The demand curve for labor pivots downward. The intersection with the supply curve defines the equilibrium net wage.

Lesson: Given a table of numbers about how much people pay in tax, you have to ask, did their wages go up to offset that tax or not? What their wages would be if not for the tax is info. you need to really know who paid the tax. Small, regular changes in tax code can start to reveal this info.

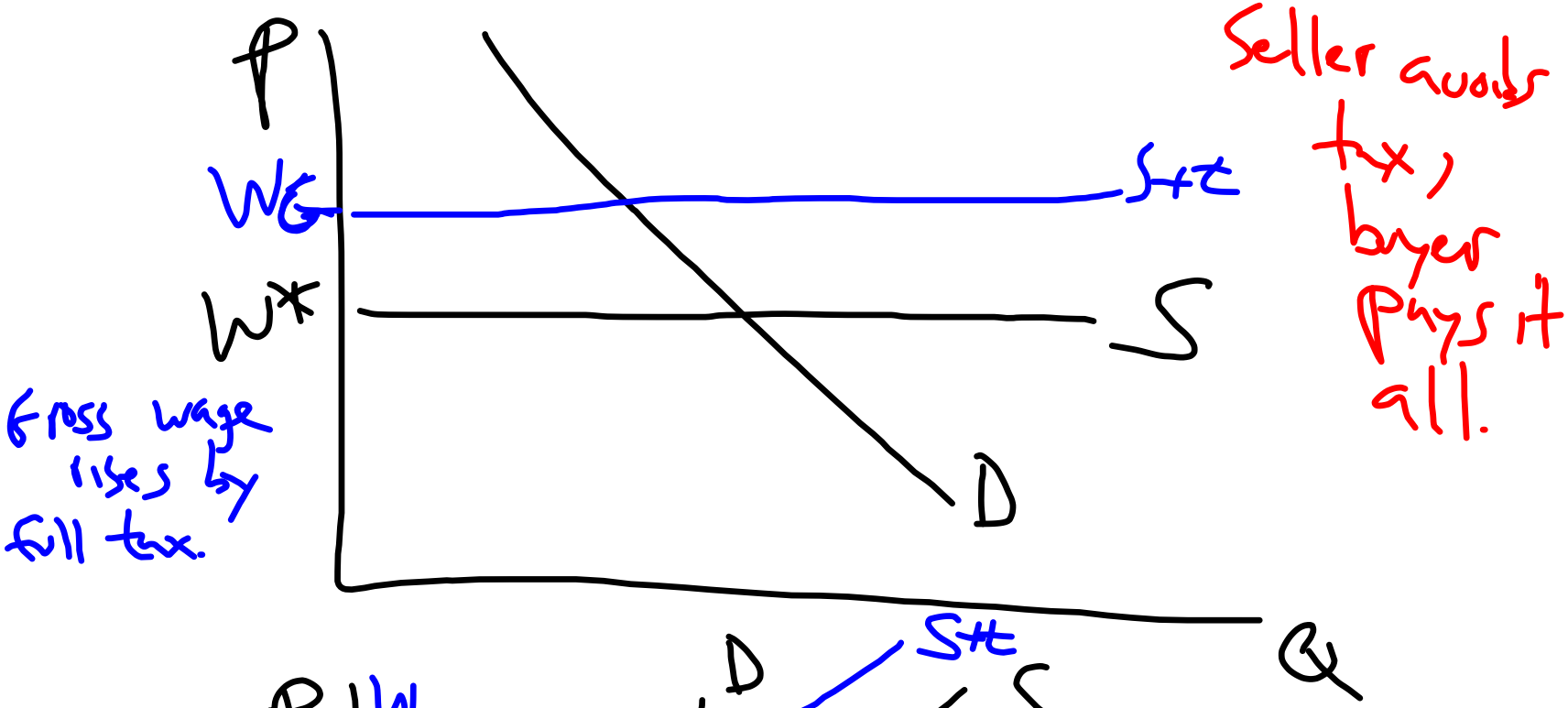
Conventional wisdom:



If tax eliminated, seller would keep it.



Again, net wage falls by full amount of tax



Seller avoids tax, buyer pays it all.

Gross wage rises by full tax.