

HOMEWORK 5
FLOORS, CEILINGS AND WALLS
ECON 101, FALL 2006
PROF. GUSE, W & L UNIVERSITY

(1) **Rent Control.** Suppose that demand for apartments is given by the following function.

$$Q_d(p) = 1000 - p$$

All rental housing units are identical with a supply given by the following.

$$Q_s(p) = \max\{0, -500 + 2p\}$$

Consider three cases. (i) No Rent Control. (ii). Rent Control where apartment (somehow) end up with the highest willingness to pay tenants. (iii). Rent Control where apartments (somehow) end up with the lowest willingness to pay tenants.

(a) Fill in the following table. Be sure to show your work and attach any graphical analysis used to obtain your numbers. I assumed rent control of \$450 per apartment. Hence I use the new quantity equal to 400 for the number of apartments in the market after RC is instituted. If you assumed a different level of rent control, you will get different numbers.

	No Rent Control	RC: Highest WTP First	RC: Lowest WTP First
Quantity	500	Q_{new}	Q_{new}
Price	500	RC	RC
Consumer Surplus	$CS_0 = \$125K$	$CS_0 + B - D$ (Fig 1)	
Producer Surplus	$PS_0 = \$62.5K$	$PS_0 - B - C$ (Fig 1)	
Social Surplus	$SS_0 = \$187.5K$	$SS_0 - C - D$ (Fig 1)	
Rental Income	$Rev_0 = \$250K$	$RC \times Q_{new}$	$RC \times Q_{new}$

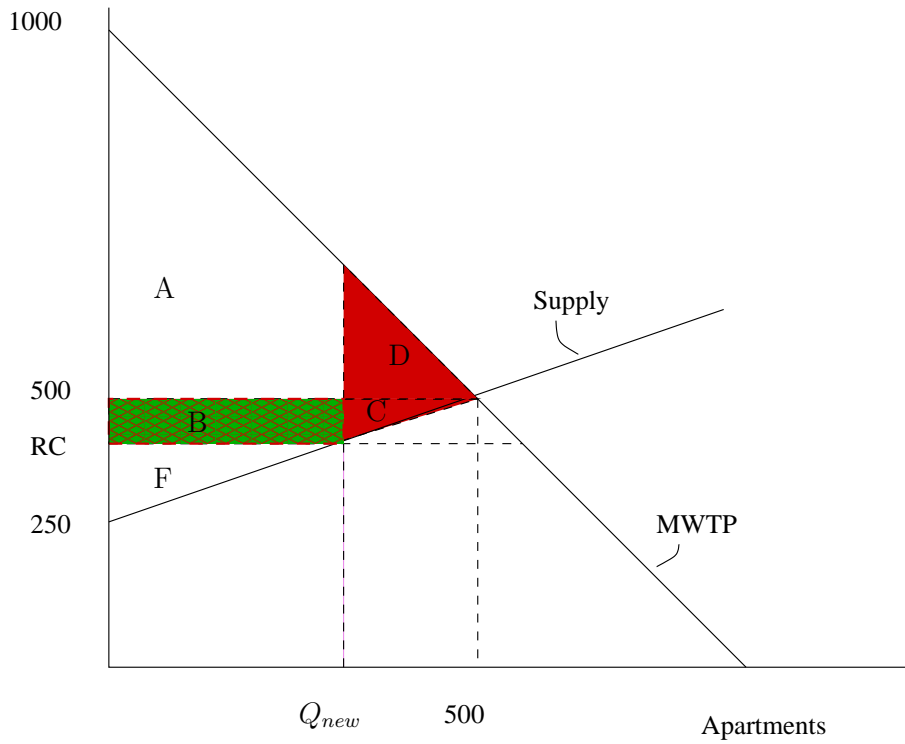


Figure 1. If the apartments go to highest MWTP portion of the demand curve, then consumers gain $B - D$, while producer lose $B + C$. Net Welfare Loss is $C + D$.

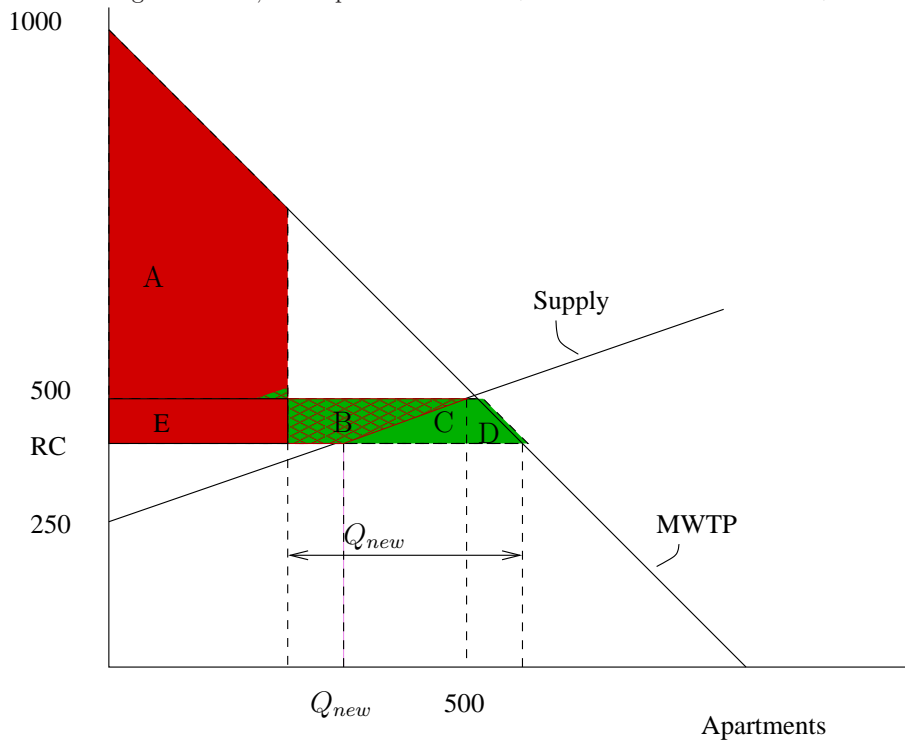


Figure 2. If the apartments go to lowest MWTP portion of the demand curve, then consumers gain $B + C + D - A$, while producers lose $B + E$. Net Welfare Loss is $E + A - C - D$.

- (b) In the case of rent control where the apartments go to the highest willingness to pay tenants, describe any incentives you can think of which may either disrupt or reinforce this allocation.
- (c) Answer the same question for the case where the apartments go the lowest WTP tenants.

ANSWER: In both cases there is *excess demand* for the apartments at the rent controlled price - folks who are willing to pay more than the rent-controlled price for the apartments they are not getting. Suppose you are a landlord in this market. If you obey the law, you get RC for your apartment. However, if you break it you stand to increase your producer surplus. In fact, since the number of apartments is fewer, you may be able to charge even higher rent than you did before there was rent control. Perhaps you don't call it "rent" *per se*. Its a fee for having new keys made or for cleaning. The tenant has very little incentive to complain to the authorities about the extra charges since apartments are very hard to find. Suppose, on the other hand, that you are a tenant in the building of a rent-control law-abiding landlord. Depending on the willingness to pay of the potential tenants who make up the excess demand, there may be several who would be willing to pay a higher rent on your apartment than you are. Why not "sublet" your apartment to one of these people. You can both be made better off. There will be more incentive for this type of tenant - driven circumvention of the law when apartments are allocated to the lowest WTP first. The difference is that when the apartments are allocated to the lowest willing to pay tenants first, it means that the pool of excess demand is made up of apartment seekers who are willing much more for the apartments they are not getting. Landlord will *always* have an incentive to break the rent control law, but their incentives will also be stronger in the case where low WTP tenants occupy the rent control apartments.

- (2) **Price Supports.** Consider a hypothetical market for rice in millions of pounds per year.

$$Q_d = 2 - 1p$$

$$Q_s = \max\{0, -.5 + 2p\}$$

where p is the price of rice (in \$ / pound). Suppose the government offers to buy an unlimited quantity of rice at \$1.25. Consider three different policies for what the government does with the surplus it purchases.

- (a) Dumps it in the ocean. Draw a diagram identifying government expenditure, change in consumer surplus, change in producer surplus and dead-weight loss.

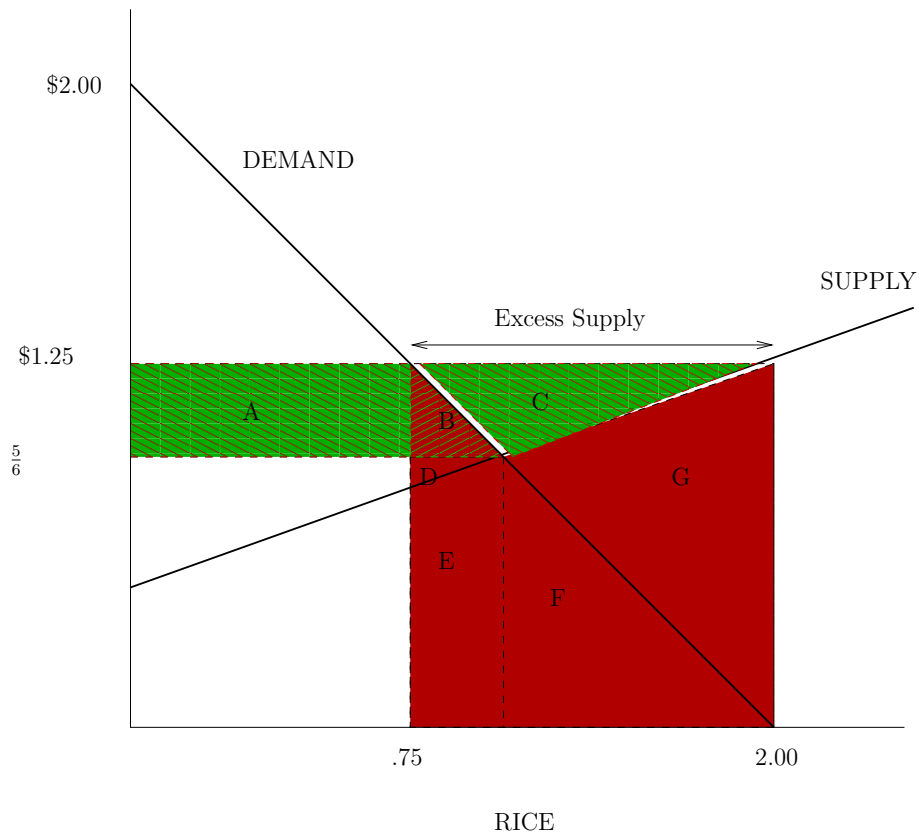


Figure 3. If the government purchases the excess supply and dumps it in the ocean, consumers will lose surplus equal to the area of (A+B), producers will gain surplus equal to (A+B+C) while the taxpayers who support the program will lose (B+C+D+E+F+G). This makes for a net welfare loss of (B+D+E+F+G)

- (b) Gives it (somehow) to only to consumers willing to pay *less* \$1.25 per pound. Compared to the case where the government dumps the surplus in the ocean, how do the surplus values you calculated in the previous part change?

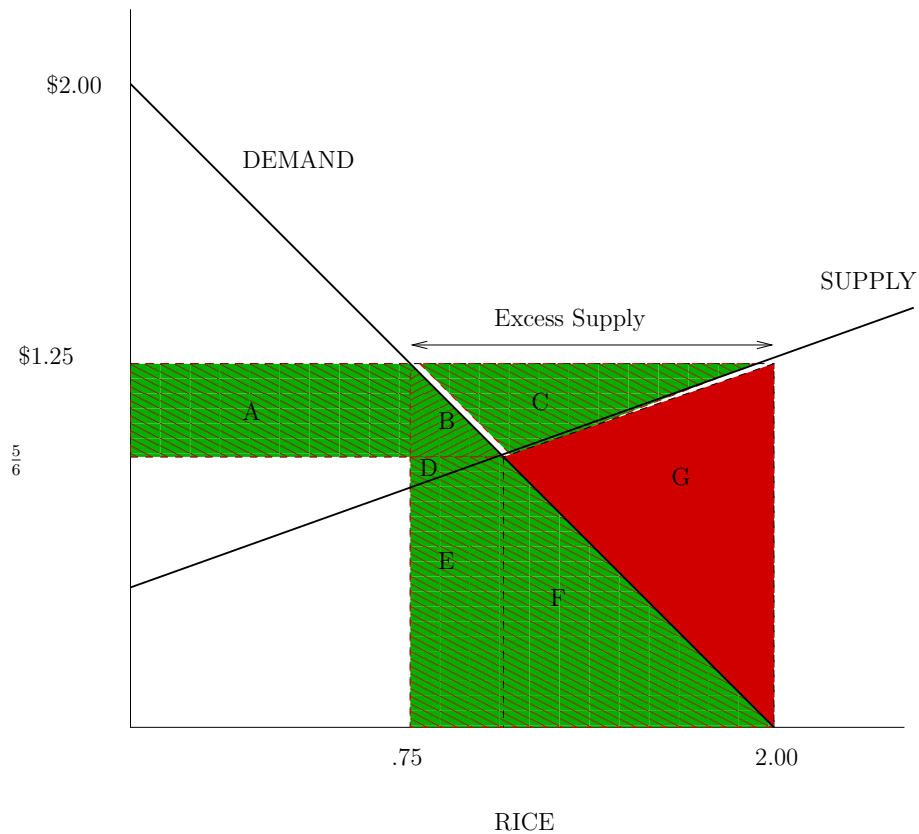


Figure 4. If the government purchases the excess supply and gives it away only to consumers who would not have purchased any rice when it was being dumped in the ocean, then compared to the case where there is no price support, the consumers who are still paying for rice with their own money are losing surplus equal to area A. Meanwhile consumers who get their rice free from the government gain DEF. Producers gain the same ABC, while the government loses BCDEFG, for a net welfare loss of G.

- (c) The government must depend on truthful reporting of willing to pay in order to implement the previous allocation rule. Discuss how your analysis changes if people lie and *understate* their willingness to pay. **ANSWER.** In this case, someone who lies about their willingness to pay in order to get a free pound of rice will reduce the quantity demanded at \$1.25 by one pound. This will increase the excess supply by exactly one pound and force the government to buy another pound. The consumer who lied will gain \$1.25 in consumer surplus, while the government will lose \$1.25 in addition expenditure. The producers will get exactly the same as in the previous part and net welfare loss will be unchanged from previous part as well.
- (d) An alternative approach to guarantee a higher price to supplier than the market price is to offer them a *deficiency payment*. Under this type of program, the government does not actually buy any rice. Instead they offer to write a check to each supplier for the difference between what the market paid and the supported price. Compare the welfare effects of this policy with the government purchase program. **ANSWER** If we have deficiency payments,

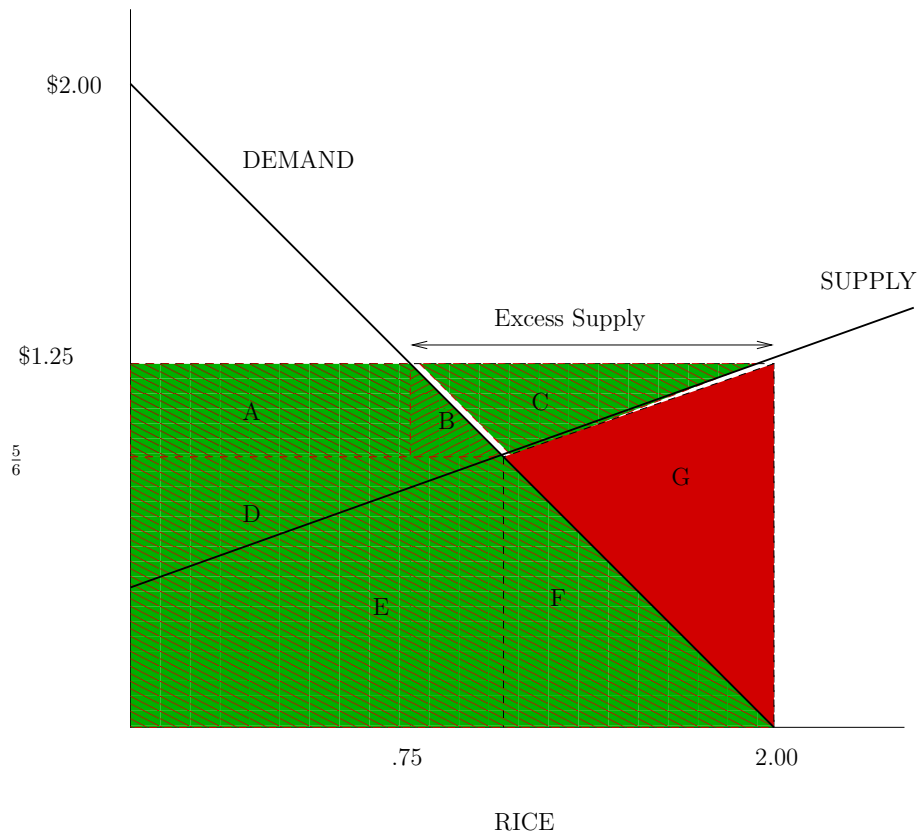


Figure 5. If the government promises a deficiency payment, the market clearing price will be zero (note this is a special case; it is zero only because that is how low the price has to go so that consumers demand all the rice that producers want to make at \$1.25). Hence the deficiency payment will be exactly \$1.25 per pound. Total government expenditure on the program will be equal to area ABCDEFG. Producers gain ABC. Consumers gain ABDEF. Net loss is G.

- (3) The City of Mayberry is determined to reduce the number of taxicabs through a licensing program. There are two options for distributing the licenses. Under Option A, taxicab licenses are handed out to the friends and relatives of city officials. Under Option B, they are auctioned off to the highest bidders.

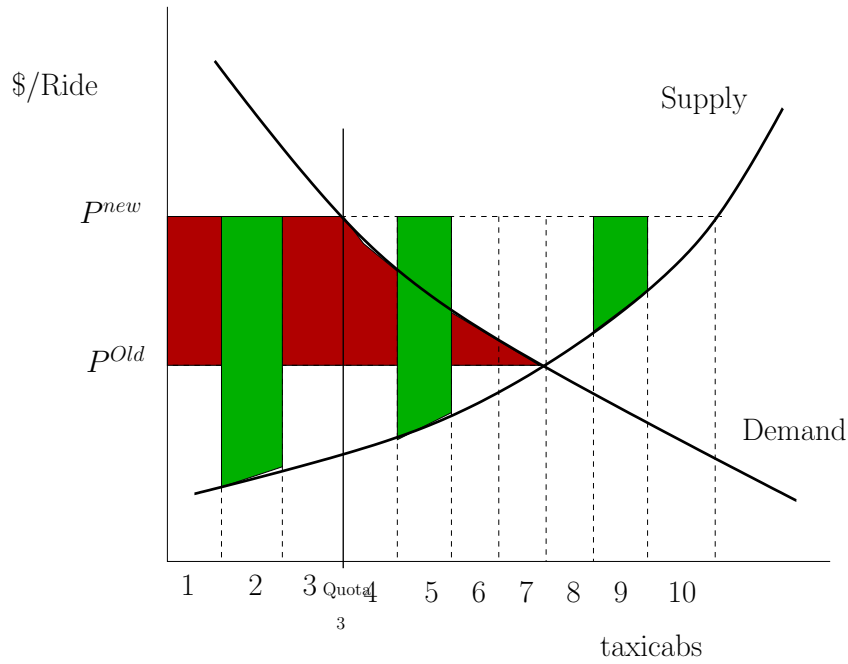


Figure 6. Under Option A, the new consumer surplus may look like the green area in this diagram. Handing out the quotas randomly does not in any way guarantee that they will go to the low cost producers.

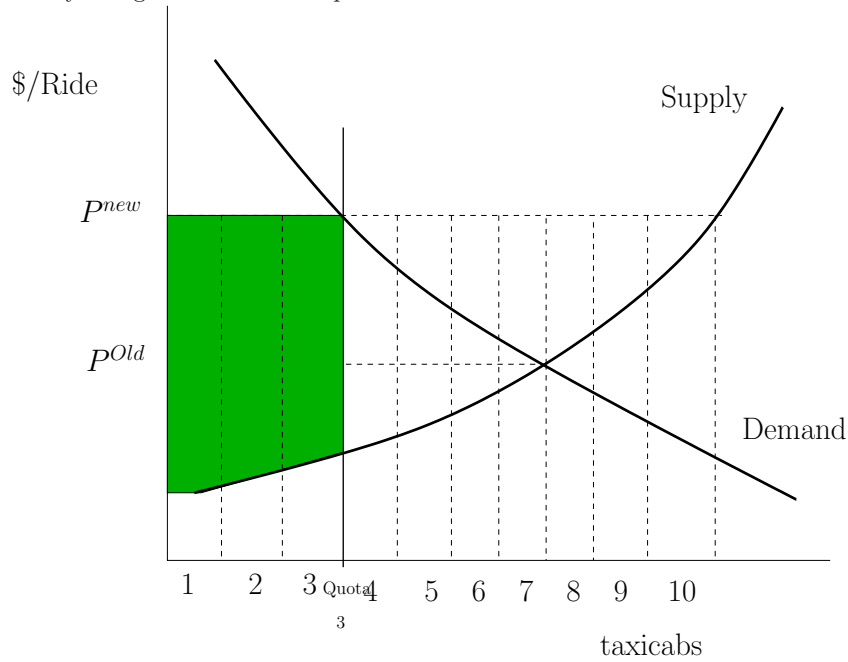


Figure 7. Under Option B, it is likely that the cab drivers who stand to earn the highest amounts of producer surplus with a license will bid higher than the others. The total producer surplus is most likely to be the green area in this picture. Since there are an equal number of licenses (equal number of green bars) under either option, this option will generate more producer surplus since these are the drivers who would get the most producer surplus (higher green bars).

- (a) Assume that once a taxicab operator is licensed, the license cannot be transferred, sold or leased. Discuss the difference in welfare effects of policy A and policy B.

- (b) Ditch the assumption. **ANSWER.** If the licenses can be sold then we would expect the licenses to end up in the hand of the lowest cost operators as under option B. The difference is that the government earn no revenue.