

What happens when the government messes with a market?

Edward Morey: draft September 25, 2017

Chapter 5 in KW is about what happens when the government interferes in the workings of a competitive and free market.

When such interference occurs, the results is often a less efficient allocation and distribution - Chapter 5 concentrates on such cases, cases where government intervention mucks things up.

Keep in mind that the government fixing prices or quantities can be a way to correct market failures (make an inefficient market allocation more efficient). But this is not topic of Chapter 5.

Don't get the idea form Chapter 5 that government intervention always makes things less efficient. Chapter 5 is about examples of where government regulation makes things less efficient.

Let's work through some examples of efficiency decreasing government interventions.

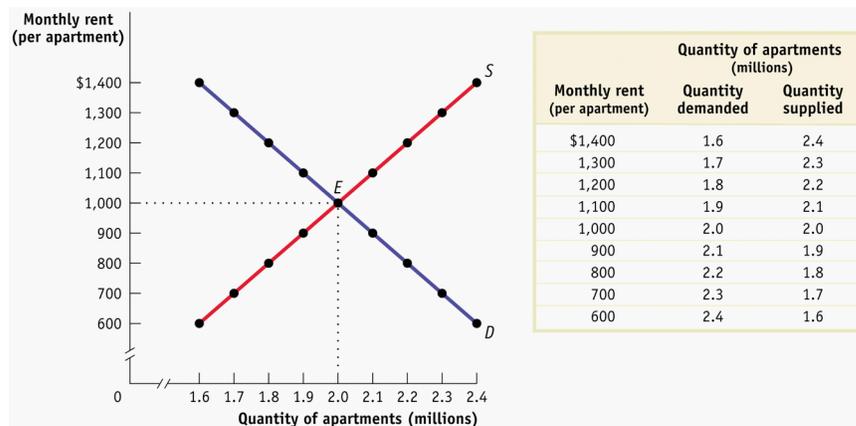
As we go along, I will try and point out when such interventions might be efficiency increasing, rather than efficiency decreasing.

1 The market for apartments in the absence of rent controls

Consider the demand and supply for rental apartments in NYC

In NYC there are some rent-controlled apartments

For simplicity, assume that all apartments are identical, and rent controlled



Note, in the absence of rent controls, in this example the equilibrium monthly rent, \$1000/month, and the number of apartments rented in equilibrium is 2 million.¹

¹The numbers in this example are not realistic. Most apartments in NY City rent for much more. There was a recent article in the NY Times about a crawl space that rents for \$450/month.

1.1 Under fairly general conditions, the market equilibrium without rent controls would be efficient

In equilibrium, with no rent controls, there are no frustrated landlords (each can rent as many apartments as she owns at \$1000 and wants to rent, and she has no desire to buy or sell apartments),

And there will be no frustrated renters or potential renters (everyone who wants to rent at \$1000/*month* can and does.

No one wants to toss their renters, no one want to move out, and landlords will not want to increase the number of rental units.

Keep in mind that this does not mean everyone is happy. E.g. some people will be homeless, and some will be living with the parents, abusive spouses, or worse.

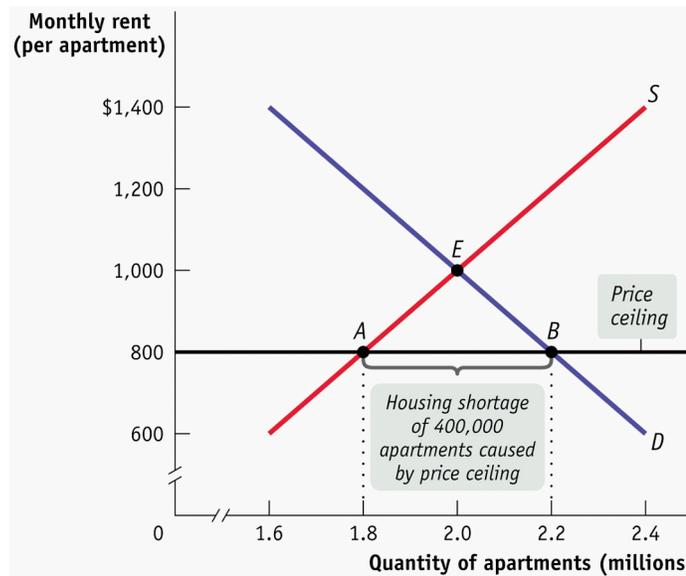
Now assume the City imposes a binding *price ceiling*² on apartments (rent controls)

The new law says, "No apartment can rent for more than \$800/month"

What will happen to the rental market?

Demand is higher because price is lower: At \$800/month, Wanda Sue and her boyfriend want to move out of her childhood bedroom.

Supply is lower because price is lower: Instead of renting out his dead-parents old apartment, Melvin, because the rent is \$800 rather than \$1000, decides to use it to store his bicycles and ballet slippers—his own apartment was getting cluttered: he would rather have the extra storage space than the \$800 and the hassle of tenants.



The example presumes the equilibrium will be efficient.

²Make sure you understand the difference between a "price ceiling" and a "price floor."

The disequilibrium (demand greater than supply at the binding price ceiling) will not be efficient. Why?

1.2 How do we know the allocation of apartments with a price ceiling is inefficient?

Deals could be made between potential landlords, existing tenants, and potential tenants that would make all three parties better off, implying that the current situation is not efficient.

Consider a single apartment which is currently rented at \$800 to someone who values the apartment at \$800 month:

- . There is someone who is not renting that would pay \$1200 for the apartment. The landlord would like to rent the apartment to him for more than \$800.

If she could rent it to him for less than \$1200, both the landlord and new renter would be better off.

But, what about the current tenant?

His willingness to pay for the apartment is only \$800, and he is paying \$800, so the current tenant would move out if the landlord paid him \$50/month to move out.

A deal could be made that would make all three parties better off, demonstrating the current situation is not efficient. (Ali will come up with an exam question along these lines.)

For example, the landlord rents to the new guy for \$1050/month and pays the current renter \$50/month to not live there.

. The landlord is better off to the tune of \$200/month ($\$1050 - 50 - 800$)

The first renter is better off to the tune of \$50/month (he prefers \$850 in spending money and living with mom to renting for \$800)

And the new renter is better off - was willing to pay \$1200/month but only has to pay \$1050.

I am not saying this is the deal that would be reached, only showing there is a deal that would make everyone better off.³

This deal, or some other efficiency increasing deal, is less likely to be struck because it is against the law. (Efficiency would increase if all three parties break the law.)

We know the current situation is inefficient because there is the potential for a deal that makes everyone better off.

³The fact that such a potential deal exists, even if just in theory, demonstrates that the current allocation is efficient.

Aplia quiz question: from Edward. In the above example, a law is passed that says all landlords must charge \$1200.

At \$1200, demand is 1.7 million and supply is 2.2 million. Which of the following is both likely to occur and to increase efficiency.

a) some renter will be paying higher than their maximum willingness-to-pay in rent.

b) landlords will offer potential renters under-the-table rebates on the \$1200 legally mandated rent.

c) renters who signed a lease at \$1200 will be mad because they are not getting a rebate under the table.

A question to consider:

In apartments that are rent controlled (a binding upper limit on the rent) , what would you predict about about maintenance and upkeep?

In general, why do landlords fix things?

In a world of flexible rental prices, the landlord knows that if quality declines the rent she can charge will decline, so landlords have an incentive to invest in the property (there is some profit-maximizing level of maintenance and this declines if the rent is fixed by law at below the equilibrium rent).

If I remember correctly, K and W have an example from Mumbai, India.

Might rent controls ever be efficiency increasing? We will get back that later.

2 Price floors on agricultural products

It is called a "floor" because the price is not allowed to fall below the floor.

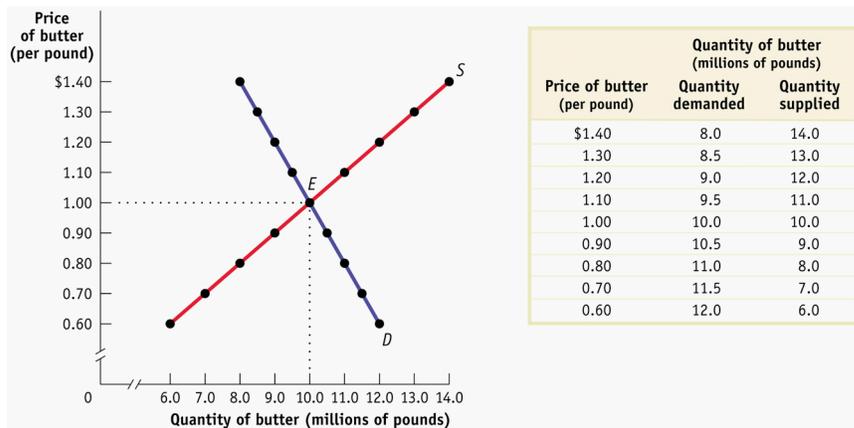
I don't know why KW chose butter.

In many countries at many times there have been government price floors put on many agricultural products.

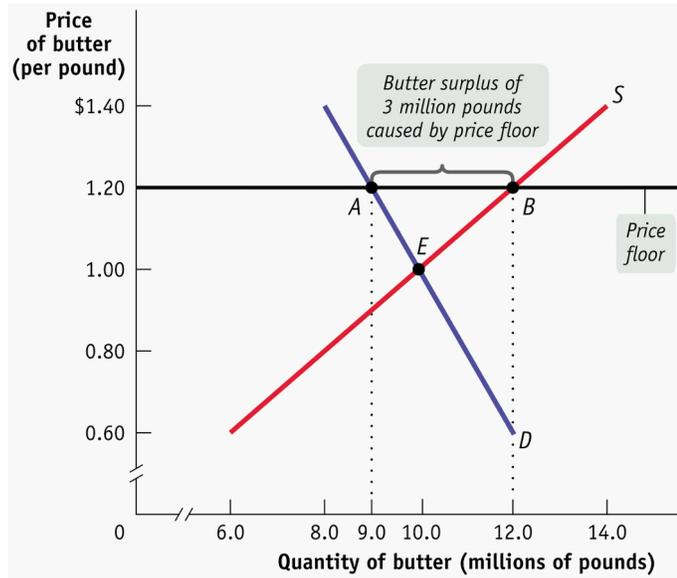
The idea is that farmers need to get a "fair" price for their produce, and the sense is the market is not doing this.

The U.S. government used to guarantee the price of tobacco.

The market for butter without a price floor.



The market for butter with a price floor at \$1.20



If one assumes there are not external effects in the production or consumption of butter, this price floor (lower limit on a price) is not efficient.

Like in the case of a price ceiling (maximum price) there is the potential to make everyone better off.

At \$1.20 a pound, the butter producers can't sell all of the butter produced.

Imagine that the quantity **demanded** at \$1.20 has been sold and consumed.

Producers with excess supply would be happy to lower the price on the excess (giving them positive rather than zero profits on the excess).

At the same time some buyers and potential butter buyers would be happy to buy some of the excess if its price were less than \$1.20.

If the excess was sold, the sellers and buyers of the excess would both be better off, with no harm done to the other buyers and sellers.

So, there is the potential to make some buyers and sellers better off, without hurting the others (the original buyers are not made worse off by these additional trades), but this potential is not realized unless there are illegal trades at less than \$1.20/pound.⁴

⁴Note that I am assuming the the guys who bought butter at \$1.20 can't undo their trades and are not pissed off that the price of butter is now less than \$1.20

This is a common real-world inefficiency. Don't call it a market failure because it is the fault of the government, not the market.

It is caused by the government trying to usurp the market by fixing the price of a product above the market price.

They do this, typically with farmers, because they feel sorry for the producer. For example, "protect the family farm."

What happens to the excess if an inefficiency increasing black market for the excess butter does not arise? It depends.

Sometimes the government buys the excess and then either destroys it (a complete waste), gives it to soup kitchens, or stores it somewhere (a Butter Bank).

Giving it to the poor is better than throwing it away, but it would have been more efficient to not produce it in the first place – the resources could have used to produce something people want more, including poor people.

If the government doesn't buy it, the butter producer is stuck with it. She, or he, can't sell it for less than the price floor, and no one will buy it at the price floor. All of the resources that went into producing this butter are wasted. (When I lived in Norway, my girlfriend's family—they owned a dairy farm—consumed more butter than they would have if the price of butter was free to fall.)

The bottom line is that from an efficiency point of view too much of the stuff is produced and only some of what is produced is consumed, and some of what is consumed is not consumed by those who have the highest WTP to consume it.

Another possibility is the government figures out how much the excess supply will be and then pays farmers to produce less butter. Again, not an efficient government action.

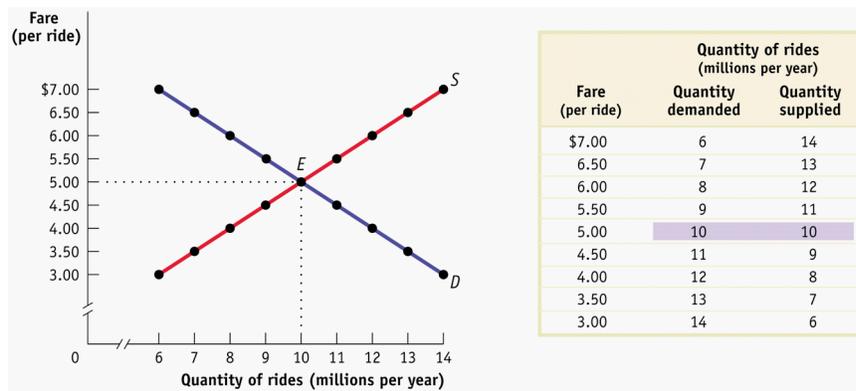
Can you imagine a situation where a price floor on butter increases efficiency?

Imagine a binding price floor on the price of tobacco (there used to be one). Or, a binding price floor on acts of prostitution (to guarantee a living wage for prostitutes). What would happen if there was a binding price floor on prostitorial acts? Supply would exceed demand at the legally mandated price, and there would be the potential for "under-the-table" illegal transactions.

3 Now let's look at restrictions on quantity (quotas)

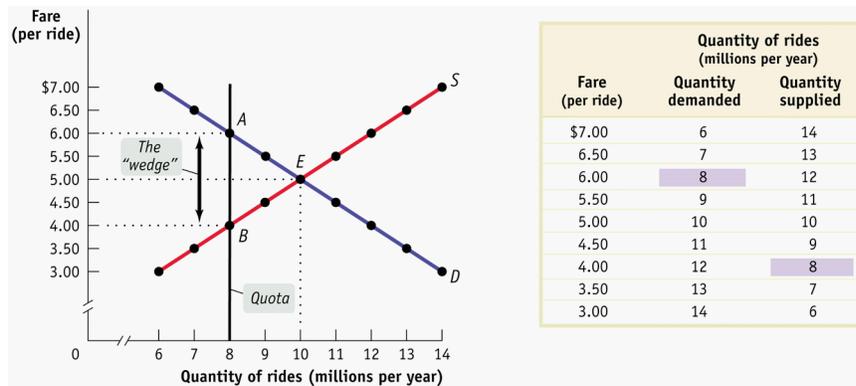
KW look at the market for taxi cab rides, per day, in NYC. For now let's assume Uber does not exist (Uber changes everything)

3.1 Here is what would happen if there are no restrictions on the number of taxicab rides produced.



The equilibrium price is \$5 and the equilibrium quantity is 10 million rides per day. Assume there are no external effects associated with driving or taking taxis.

3.2 But in NYC there is an upper limit on the number of taxi rides (there is an upper limit on the number of taxis), and that upper limit is less than the number of taxi rides that would be bought and sold in market equilibrium



KW draw the graph assuming the imposed upper limit on taxi rides is 8 million

When quantity is restricted to 8 million rides per day, the marginal customer would pay \$6 for a ride (their max wtp) and the marginal taxi would be happy to supply him with a ride for \$4 (their max wta).

3.2.1 So, what will a ride cost?

It will cost \$6, what the market will bear—the available taxis have no incentive to charge less.

This is a good deal for those who have a license to be a taxi.

They make an excess profit of \$2/ride on every ride (\$2 more than they were willing to charge).

There is a wedge between *WTP* (\$6) on the part of potential customers and *WTA* (\$4) on the part of potential taxi drivers

Driving a taxi is a profitable business in NYC. Or is it?

3.2.2 But before we get to the profitability of driving a taxi in NYC, is the the situation efficient?

No,

Taxi drivers and potential taxi drivers would love to provide more rides to the residents of NYC at a prices less than \$6 but at least \$4, but, legally, cannot because of the quota.

Some potential riders would love to get a taxi for less than \$6 and are willing to pay more than \$4, but, legally, cannot. And the taxi drivers would like to produce some of these illegal rides.

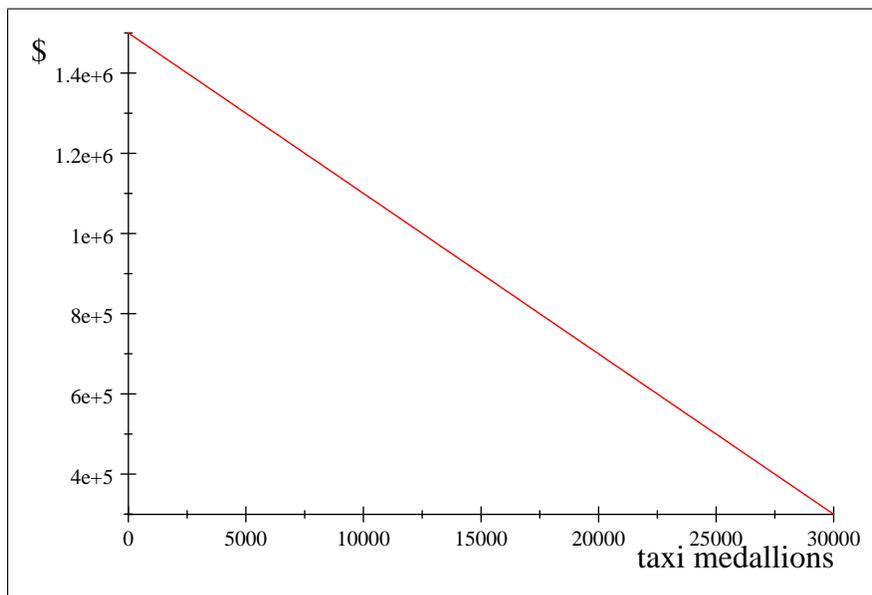
If these potential drivers and riders could make a deal ,both would be better off, so the current situation is inefficient.

There are a bunch of guys would would turn their cars into taxis if it were legal and they could charge \$5/ride. And there are bunch of people who currently do not ride in taxis that would pay them the \$5 to ride in the new taxis.)

3.2.3 How does NYC limit the number of taxi rides?

They do it by limiting the number of legal taxis. In NYC you need a taxi medallion to legally operate a taxi. There is a fixed number of medallions, initially issued by the government. These medallions can be bought and sold, there is a free and competitive market for the existing taxi medallions. Think of these medallions as permits, permits to operate a taxi.

Let assume the demand curve for medallions is the red line. Note that this curve also denotes marginal willingness-to-pay for an additional medallion.

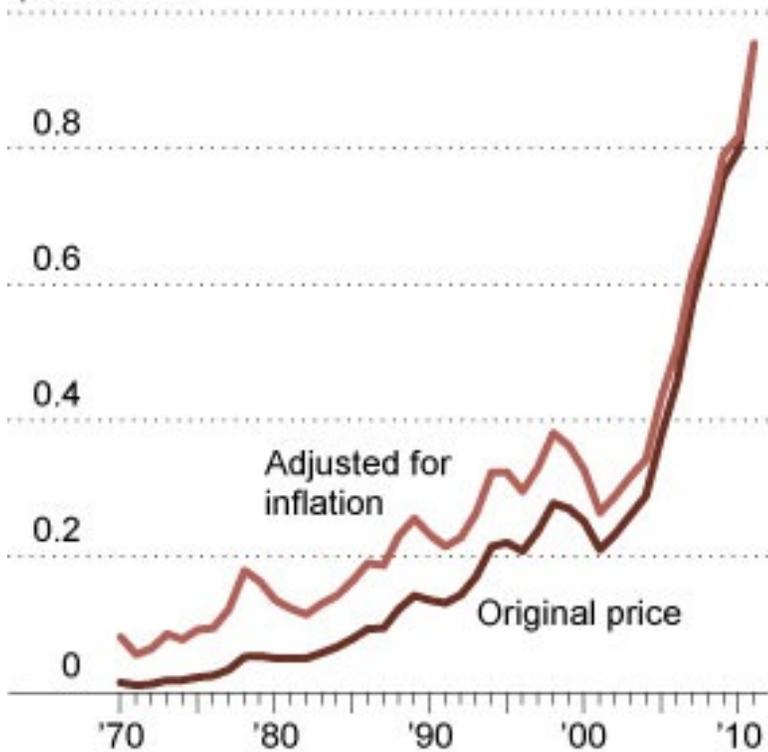


Demand for and fixed supply of medallions

The current number of medallions is currently fixed at approximately 13,000. So draw a vertical line at 13,000. This is the supply curve for medallions (supply is fixed at 13K). And, supply (fixed) equals demand at a *MWTP* of approximately \$1M – what two medallions recently sold for (see the reading on NYC taxi medallions on the lecture web page).

CORPORATE TAXI MEDALLION PRICE

\$1.0 million



CHANGE IN VALUE SINCE

7,000%



Not these graphs are pre-Uber

The high price of a medallion reflects the wedge the government created between taxi fares (\$6 in a graph above) and the price a taxi would be willing to provide the ride (\$4 in that same graph)

This results in an excess profit per ride to the owner of a medallion of \$2,

This is why some potential medallion owner is willing to pay so much for a medallion.

BUT all this excess profit per-ride gets soaked up by the cost of a medallion (or the opportunity cost of keeping your medallion if you already have one).

The people who initially got the original medallions, have seen the price of medallions rise over the years (a scarce appreciating asset) and some of those owners have sold their medallion and used the money to retire to Florida.

Others rent out their medallions at a rate that reflects they are worth \$1M.⁵

The people who buy the medallions don't make excess profits from driving a taxi when one consider the opportunity cost of the \$1M they invested in the medallion.

Some times the government increases the number of medallions by auctioning off a 100 or so additional medallions. This shifts the supply curve for medallions to the right and decreases, a bit, the price of medallions. Current medallion owners don't like this.

⁵If one assumed the interest rate is 5% a year. The opportunity cost of putting \$1M in the bank is \$50K a year (approximately \$140 a day). So, a medallion would rent for about \$140 a day.

The medallion scheme has a lot of other interesting implications Legal taxis are operated 24/7. When the owner is not driving the taxi, it is leased/rented to someone else.

There is a great incentive for illegal taxis - individuals who will drive you, illegally, wherever you want and at a fare below the market price for a ride in a legal taxi.

The quota on taxis creates an incentive to create services such as Uber car.

Note that the real world of New York City taxis is actually more complicated than this example suggests. The price of a taxi ride is set by a regulatory commission.

3.3 What is the take-home story from the taxi medallion example?

Quotas are bad, or quotas can **sometimes** be bad?

The latter?

If the market equilibrium would have been efficient, then imposing an upper limit on supply (a quota) will cause inefficiency.

An important general point, is **If the market equilibrium with no government intervention would have achieved efficiency, then government intervention will cause the equilibrium (with government intervention) to be inefficient.**

However, sometimes a quota can be used to correct a market failure. Or said another way, sometimes the market equilibrium with no government intervention is inefficient, and a quota might increase efficiency.

Should there be a quota on heroin if we assume users are behaving rationally? Would a legal, unregulated market for heroin in equilibrium generate the efficient amount of heroin production and consumption from society's perspective? We will answer these questions in a bit.

Whether the a legal, unregulated market for heroin for cause the efficient amount of heroin to be produced depends on whether there are external effects associated with the production and consumption of heroin.

Draw a graph dollars on the vertical axis, and aggregate quantity of heroin on the horizontal axis. Assume, and draw, and downward-sloping aggregate demand curve for heroin.

Now draw two hypothetical supply curves for heroin: one assuming the government imposes a binding quota of zero on the supply of heroin⁶, the other assuming heroin is legal and profit-maximizing firms produce and sell heroin.

Many people would argue that there are negative external effects associated with the production and consumption of heroin, so would argue that an unregulated competitive market for heroin would lead to an inefficient amount of production and consumption (too much).⁷

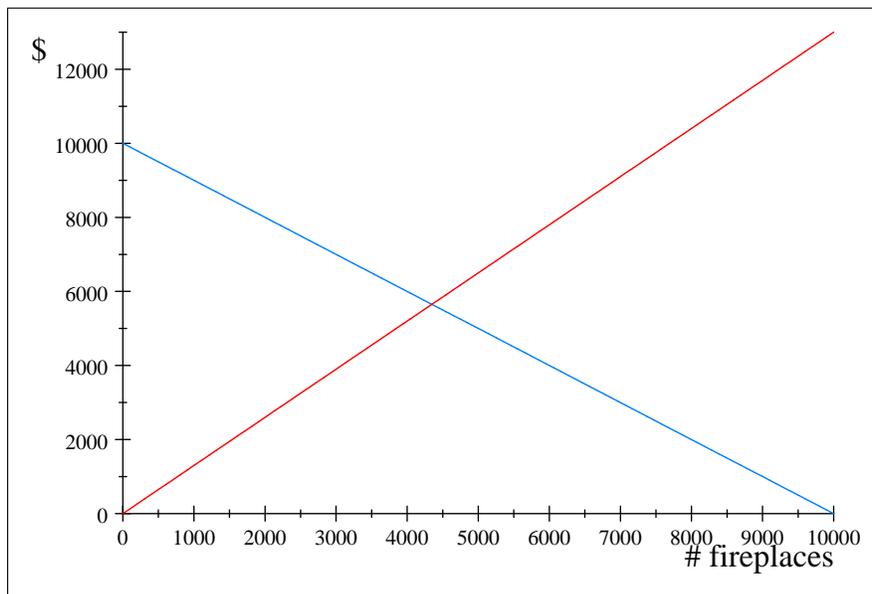
⁶Think about two different scenarios: they can enforce the zero quota, or they cannot enforce it.

⁷Note that the direct effects on the consumer are not an external affect. You shoot heroin because, in your view, the benefits exceed the costs). Of course, things are complicated by the addictive qualities of heroin.

4 Consider the demand and supply of wood fireplaces in Aspen, a box canyon.

People want wood fire places in their mountain condos: they looks nice, throwing a log on the fire is what one does in the mountains, and, because of this, a condo with a fireplace will rent for more, *ceteris paribus*, than one without a fireplace.

Consider my hypothetical demand and supply functions for wood fireplaces in the city of Aspen



Demand (blue) and supply (red) of fireplaces in Aspen

Fireplaces in Aspen are fancy and expensive to install. If my graph is correct, the free market equilibrium quantity is around 4000 fireplaces, and the equilibrium price is around \$6000

4.1 However, burning wood in a box canyon produces smoke which reduces visibility, burns eyes, and causes respiratory problems (pollution) for other people in Aspen, so the free-market equilibrium number of fireplaces is too high from an efficiency perspective (a market failure)⁸

How would you explain that it is too high from an efficiency perspective? If there is no government intervention in the market, the equilibrium number of fireplaces will be inefficient – too many, because the social cost of having a fireplace is greater than the private cost.

The city of Aspen hires you as an economic consultant a \$5K/day to find a solution.

You determine that the efficient number of fire places is 2500, not 4000. (You collected a lot of data that you used to estimate a fancy statistical model, and so made a lot of money – the project took you weeks)

You recommend a fireplace medallion program (like the NYC taxi medalion program) - one won't be able to have a fireplace unless one owns one Aspen fireplace medallion, and the medallion is registered to that fireplace.

The city creates 2,500 medallions (the efficient number of fireplaces), auctions them off on steps of city hall, and imposes a big fine on any one who has a fireplace but not a medallion, such a big fine that even Donald Trump would not want to pay it.

People are allowed to buy and sell medallions. (Some houses might end up with six fireplaces, many super-rich dudes have homes in Aspen)

Or the government initially gives the medallions away to some of those who currently have a fireplace. This might be done so the current fire place owners don't scream too loud

For example, in the Aspen example, the city might have given each fire place owner $25/40 = 0.625$ of a medallion. In which case one would need to purchase a fraction (37.5%) of a medallion if one wanted to keep their fireplace.

⁸ Assume that the person using the fireplace takes account of the effect on him or her of the indoor pollution generated.

The efficient number of fireplaces exists (2,500), and the medallions will be owned by the people with the highest willingness-to-pay to have a fireplace (rich people, or people who rent condos to rich people). Efficiency requires that the medallions are owned by the people with the highest WTP for fireplaces.

If I have a higher WTP than you for a fireplace medallion, if you have one, you can sell it to me and make both us better off. This is efficiency increasing, and it will happen.

Who will end up with fireplaces? The 2,500 individuals with the highest WTP. Any other allocation of the 2,500 permits would be less efficient. (The market allocates scarce commodities to those with the highest WTP for those commodities.)

This system exists in some mountain communities, and works (need to research more specifics). Maybe one of the T.A.s would like to do some research on this.)

returning to the NYC taxi example

If Taxis produce significant negative external effects (pollution, congestion, unsafe streets), the the unregulated number of taxis would be too large (more than the efficient number). In which case requiring a taxi medallion, and limiting the number to the efficient number of taxis, would increase, not decrease, efficiency. If taxis produce negative external effects, efficiency dictates that their numbers are limited.

If Taxis produce significant positive external effect (e.g.) the the efficient number of taxis is greater than the market equilibrium number taxis when there are no medallions. In this case the government want to subsidize taxis, and a medallion program would not be the way to do this.

Wrt whether there should be limit to the supply of heroin?

The question is how much heroin would be produced and consumed if the market for heroin was unregulated (legal with no taxes or restrictions), and whether this amount is greater than the efficient amount.

If heroin consumption (or production) produces negative external effects, the unregulated market will lead to over consumption, and limiting supply (a quota) could increase efficiency, if one limits supply by the correct amount. Not that the legal quota is often set at zero, but with a zero legal quota there is still a positive amount produced and sold. Is the efficient amount of heroin zero???