

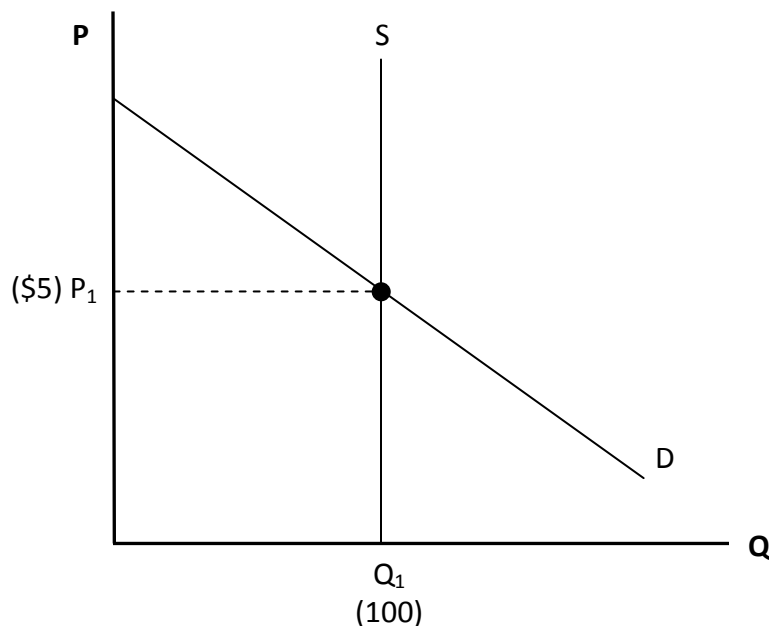
## Market dynamics and surges in demand

Econ 201/Haworth

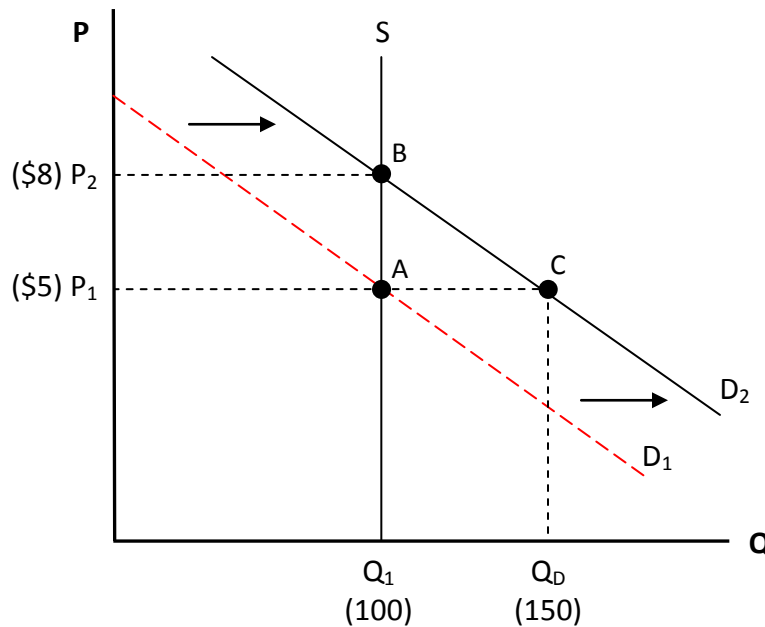
Certain markets are susceptible to sudden changes in demand. How firms respond to those surges is of interest to us in a microeconomics course. Consider what happens in the Winter when snow is announced. Consumers assume that this weather event will limit their ability to purchase food and other essential goods, and so consumers flock to the store in search of things like bread and milk. As a result, these goods disappear from the shelves, but because these weather-related events are often viewed as shortlived (e.g. expected to last for a few days at most), the shortages created by these surges in demand are not long-lasting.

What about situations where the event driving this surge in demand is expected to last for much longer? E.g., assume an event takes place which leads to consumers believing that their ability to access vital goods will be limited for an extended period of time. We'll call one of these goods "good X" and examine this situation below.

The retail market for good X is assumed to work like this. We have a downward-sloped demand curve for good X, but the supply of good X is perfectly inelastic. I.e., retailers receive set amounts of good X every period, and once those quantities have been shipped to the store, they are constant for that time period. E.g., retailers receive 100 units of good X to sell each period, and then, based on demand, set the price. We've illustrated this in the graph below, assuming that the equilibrium price ( $P_1$ ) is \$5 and equilibrium quantity ( $Q_1$ ) is 100 units.



Now, let's examine how the market changes when there's a surge in demand. Assume that the demand for good X increases (demand shifts right from  $D_1$  to  $D_2$ ).



There are 2 choices that we must consider here. First, should the retail firm change its price? If the retail firm recognizes the surge in demand and wishes to avoid a shortage, then the firm could raise price from  $P_1$  to  $P_2$  (i.e. charge \$8 instead of \$5). We would move from pt A to pt B.

Depending on the good or state, there may be laws against sharp increases in price during any type of emergency (these are called price gouging laws), which obviously prevent a price increase. In many other situations, there could also be a perceived cost associated with raising price. E.g., retail firms could actually incur a cost from changing the posted price, due to having to post new price labels on the good.

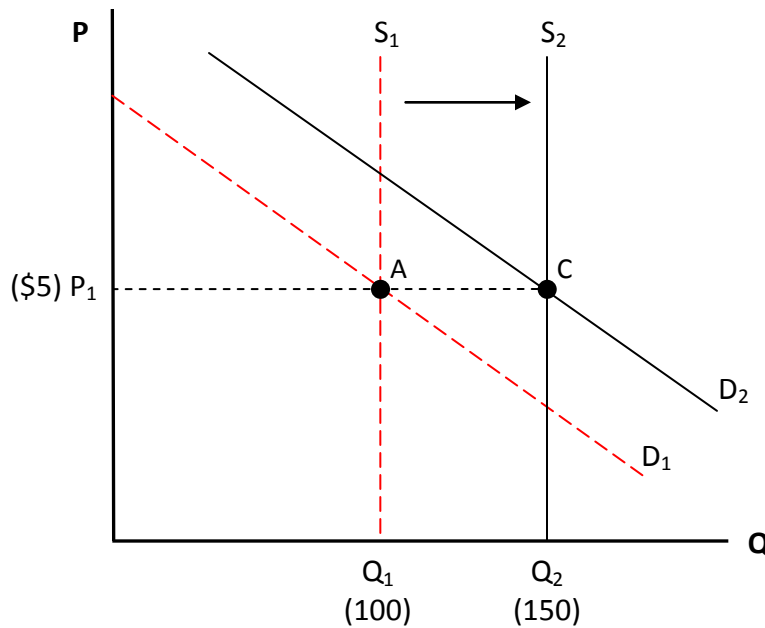
There may also be a cost in terms of angry consumers. E.g., if firms raise price during an emergency, then even if the price increase violates no existing laws, consumers may view the price increase as the firm taking advantage of consumers during a time of distress, and could stop shopping at certain retail institutions. Or, at an even more basic level, the retail firm could simply feel bad about raising prices on consumers during a difficult time.

Without necessarily citing a reason, suppose retail firms choose not to raise their price. If firms continue to charge  $P_1$  (\$5), then there will clearly be a shortage. Pt A will be the quantity supplied, and pt C represents the quantity demanded, and the result is a 50 unit shortage. This is the situation we typically observe with certain goods in these situations.

Our second choice involves the firms who supply good X to retailers. The decision of these supplier firms concerns whether to increase production and meet the excess demand, vs not increasing production – realizing that demand is likely to fall in the future as people consume their hoarded quantities rather than buy the good from retailers.

If supplier firms do not increase production, then the shortage will continue until demand begins to return to normal. E.g., consumers are not actually consuming more of good X, they are hoarded units of good X. Over time, consumers will stop buying units from retailers and demand will fall until consumers consume all of their hoarded units and must start buying good X from retailers again. I.e., after the initial increase, demand will eventually decrease over time. If suppliers firms make this choice (i.e. don't increase production), then we would remain at Graph #2 and eventually return to Graph #1.

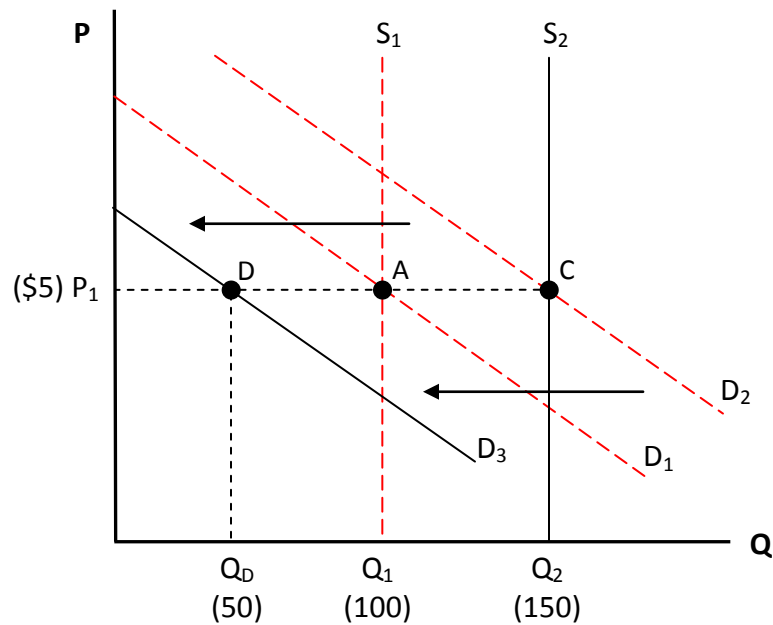
Let's say that supplier firms decide to increase production and provide the additional 50 units to this market. If they do, then the supply curve shifts right, from  $S_1$  to  $S_2$ .



This increase in supply alleviates the shortage, but let's consider what happens when consumers start consuming their hoarded units and stop buying good X from retailers. To better understand what can happen, let's consider the following. Graph 1 shows period 1, where we have 50,000 consumers buying 2 units each for sales of 100,000 units. Graph 2 shows period 2, where those 50,000 consumers suddenly want 3 units (overall sales of 150,000 units). Of course, when the price remains at \$5, we get a shortage, and no one gets that extra unit.

In Graph 3, however, we see that suppliers have stepped up to increase production and provide enough units to satisfy demand. Everyone gets that 3rd unit. Let's assume that this is a good with otherwise very stable demand. In other words, consumers don't really need 3 units per period, they only need 2 units per period. An example of this would be toilet paper, where the growth in toilet paper sales will parallel growth in the population – meaning that any given person has a tendency to use the same amount of toilet paper each period.

So let's say we enter a period 4 – when everything returns to normal – what do we observe? With people not concerned about their ability to access good X, we know that demand will decrease again, but by how much? Recall that consumers bought an extra unit in period 3, and so demand in period 4 would only be 1 unit per consumer. Therefore, the demand curve shifts to a level that's even lower than where we started. Below, that's illustrated by the shift from  $D_2$  to  $D_3$ , and so now, consumers purchase only (overall) 50 units.



As we enter period 5, what happens? In a normal period, consumers purchase 100 units, but in period 5, retail firms still have those 100 surplus units. Therefore, retail firms would not need to buy units from supplier firms, which means that supplier firms would shut down in period 5.

What does all of this mean? For one, this example answers the question as to why we don't see big surges in the production of certain goods during an extended crisis. I.e., why we may observe prolonged shortages of certain goods during an extended crisis. This has nothing to do with firms being unable to supply more units, it likely has more to do with supplier firms not wanting to create eventual surpluses and experience the problems inherent in those surpluses

(i.e. loss of profit and layoffs). Note here that all of this applies well to a good like toilet paper, but what if good X is milk? I.e., a perishable good with an expiration date.

Whether good X is perishable or not, we still get a surplus in period 4. The problem now, however, is that retail firms could be stuck with a 100 unit surplus that goes bad at the end of period 4. This would lead to a loss of profit for retail firms. In period 5, consumers would not be buying units from the surplus, they would buy newly produced units of good X, which means that suppliers would not experience any problems from this situation. In effect, if the real world follows what we did in this example, making good X a perishable good transfers any loss from supplier to retailer.

This would further explain why we might observe more short-lived shortages in goods like milk than with goods like toilet paper during an extended crisis. Supplier firms would have a lesser incentive to produce additional units of a good like toilet paper, because doing so could lead to supplier firms experiencing a loss of profit and potential layoffs. With a good like milk, however, supplier firms would be willing to produce additional units after a surge in demand, because they would not necessarily suffer the consequences associated with any resulting surplus.