ECONOMIC THEORY 2

SUPPLY AND DEMAND: ASSUMPTIONS

1. *All variables and parameters are real numbers*, which means that we are implicitly assuming that all commodities are infinitely divisible and that all transactors are infinitely discriminating.

2. Prices and quantities are determined in *perfectly competitive markets* so we are assuming that the commodity is homogeneous and that *buyers and sellers are price takers.* Transactors are assumed to know all prices.

3. The analysis is *partial*, rather than *general*, *equilibrium* in nature. This means that (among other things) in our model the prices of substitutes and complements and income are **exogenous** and do not change when the price and/or quantity of the commodity being modeled change. *All transactions take place **only** at equilibrium prices*.

4. Usually we are concerned with the *short run* and so there is no entry or exit into the market and there are diminishing returns to the variable input.

5. Tastes, technology, and factor endowments are given.

6. The commodity being modeled is a *flow* commodity, a non-durable good or service, such as a loaf of bread, rather than a durable good such as an automobile. There are no inventories and no hoarding.

7. The commodity is of a *known* and *constant quality*.

8. *All units of the commodity sell for the same price* so that there are no quantity discounts, "sales", or differences between "list" and actual prices paid – as there are for automobiles.

9. *All buyers pay the same price* so there is *no price discrimination*.

10. Prices reflect the *full opportunity cost* of the commodity including, for example, the implicit cost of the time necessary to purchase and consume the commodity. There are *no transaction costs*. All prices are in *real* (i.e. price deflated) terms.

11. Expectations are neutral. There is *no uncertainty* concerning future prices or incomes.

12. Q^d, which is unobservable, is *inversely and monotonically*, related to P.

13. Q^s, which is unobservable, is *directly and monotonically*, related to P.

14. Demand and supply functions are *continuous*.

15. The *vertical intercept* of the demand curve lies above that of the supply curve, and the *horizontal intercept* of the demand curve lies to the right of that of the supply curve.

ECONOMIC THEORY 3

THE LOGIC OF SUPPLY AND DEMAND

1. A SINGLE SHIFT

An **increase** in the price of a *substitute*, a **decrease** in the price of a *complement*, an **increase** in *income* with a *normal* good or a **decrease** in *income* with an *inferior* good, an **increase** in *tastes*, and an **increase** in the *number of buyers*, all cause **demand** to **increase**, i.e. cause the demand curve to **shift** to the **right and upwards** from its original position. These variables constitute the **exogenous demand side variables**.

[Figure 1 goes here.]

Because we are doing **qualitative** analysis we *do **not** know how far the demand curve has shifted* and so all we can say is that the new equilibrium will be at some point on the supply curve above and to the right of the initial equilibrium at Q^e, P^e, i.e. the new equilibrium point will lie on the "thick" section of the supply curve in Figure 1. (*You should do the analysis for the **remaining three cases:*** a shift in the demand curve to the left (caused by what?), a shift in the supply curve to the right or left (caused by what?).)

[Figure 2 goes here.]

We can see from Figure 2 that the initial equilibrium position (where the demand and supply curves intersect at Q^e, P^e) allows us to divide the positive orthant into four sectors labeled A, B, C, and D. As you can see price and quantity are both higher than their original equilibrium values in sector A, and price is lower but quantity transacted is higher than the original equilibrium values in

sector D. We can use this diagram to deduce what must have happened if, for example, we discover that the price has risen while quantity has fallen, for in this case we must be in sector B and so supply **must** have decreased. Notice that price and quantity move in *opposite* directions when *supply* shifts (because demand curves are negatively sloped), while price and quantity transacted move in the *same* direction if *demand* shifts (because supply curves are positively sloped).

2. **BOTH CURVES SHIFT**

The **supply** curve will **shift** to the **right**, i.e. there will be an *increase in supply*, if the *price of an input* **falls**, *technology* **improves**, *taxes* **fall**, *subsidies* **increase**, *government regulations* are **relaxed**, *weather* and growing conditions **improve**, or the *number of suppliers* **increases**. These are the **supply side exogenous variables**. *If the demand curve simultaneously shifts to the right* -- and we still only posses qualitative information -- then we can see from Figure 3 that the *quantity transacted must increase* but that ***we cannot predict what will happen to the price*** of the commodity. Similarly we can see from Figure 4 that *when demand increases and supply decreases* we can predict that price will rise but *we cannot say what will happen to quantity transacted.*

[Figures 3 and 4 go about here.]

The logic of these results follows from the meaning of the terms an increase in demand and an increase in supply. An **increase in demand** means that consumers wish to ***increase*** *the quantity demanded at each and every price,* and that *they are willing to pay* ***higher*** *prices for each and every quantity. Similarly* an **increase in supply** means that firms are willing to ***increase*** *the quantity supplied at each and every price,* and that *they are willing*

*to accept **lower** prices for each and every quantity*. Therefore, in this case *households and firms agree about what should happen to the quantity transacted* -- they both want it to increase -- but that *they have different views about what should happen to price*. Hence, we can predict what will happen to quantity transacted but **the price change is indeterminate** (not indetermin**ant!**).

You should be able to do all *four* cases -- the two in which the curves shift in the *same direction* (where the quantity is determinate and the price indeterminate), and the two in which the curves shift in *opposite directions* (in which case the price is determinate and the quantity transacted is indeterminate). **You must be able to do the analysis verbally, diagrammatically, and, ultimately, *algebraically*.**

Figure 1

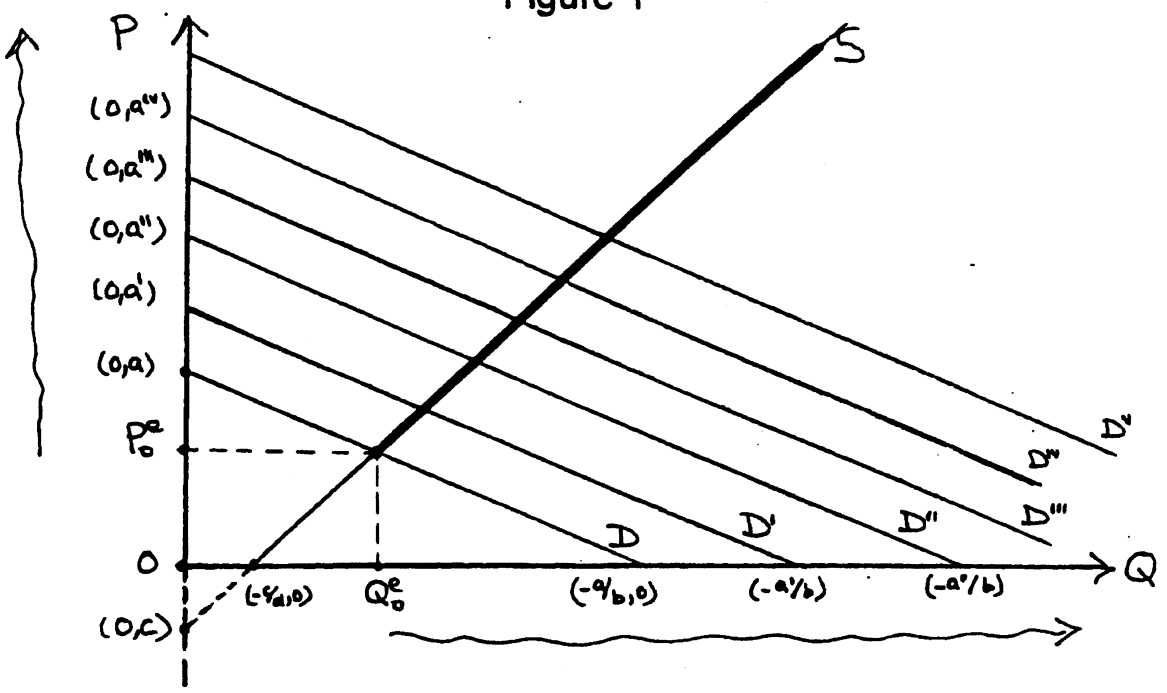

Figure 2

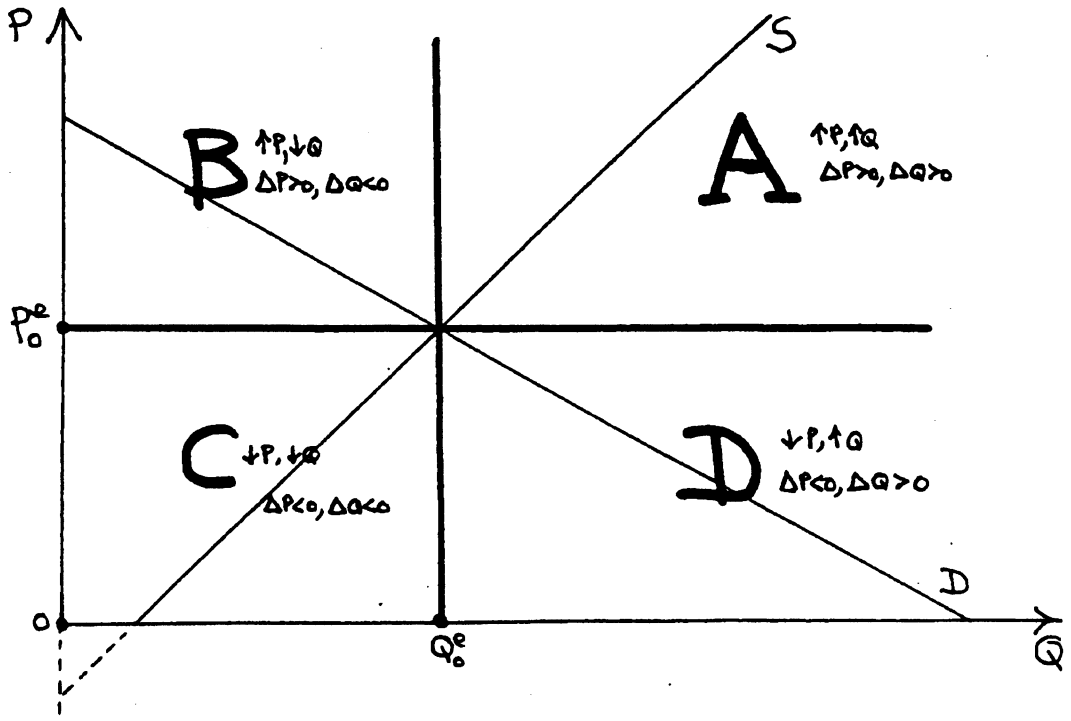

Figure 3

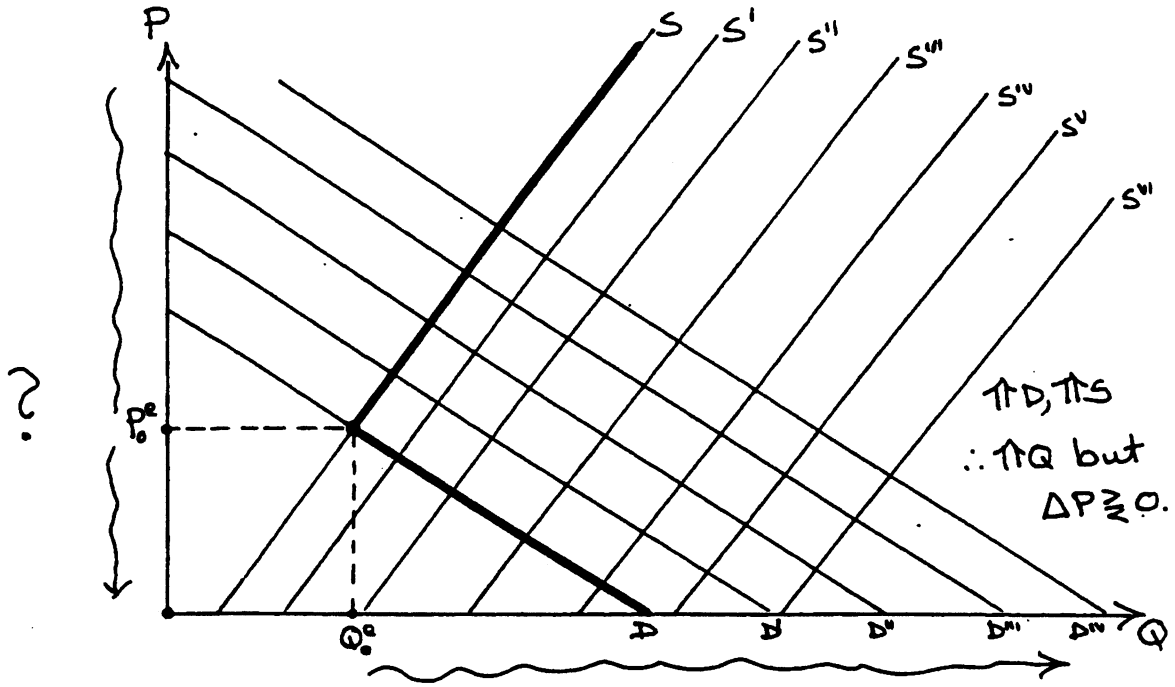

Figure 4