Section Exercise for February 1/2

1) Let us calculate consumer and producer surplus in the market for venture capital investments in Silicon Valley. Let us measure the value of companies created and sold to venture capitalists in units of "unicorns"—one unicorn is a company that might become the next Facebook…

a) What, in the year 2016, will be the demand curve—in billions of dollars, and in "unicorns" created—if the maximum willingness-to-pay for even a small stake in a "unicorn" on the part of the most optimistic venture capital investor is $10 billion/unicorn, and if each $1 billion reduction in the price charged for a one-unicorn investment increases the number of unicorns VC investors are willing to buy by 2 unicorns?

(in billions) $P_d = \$10 - Q/2$

b) What, in the year 2016, will be the supply curve—in billions of dollars, and in "unicorns" created—if programmers, entrepreneurs, and venture capitalists can produce an unlimited supply of potential unicorns at a cost of $100 million per unicorn?

(in billions) $P_s = \$0.1$

c) What will be the quantity and price in equilibrium?

(in billions) P = $0.1, Q = 19.8

d) What will be the average willingness-to-pay of those VC investors who do invest in unicorns?

AWTP = ($10 +$0.1)/2 = $5.05 (in billions)

e) What will be the average opportunity cost of those programmers, entrepreneurs, and venture capitalists who create the unicorns?

AOC = ($0.1 +$0.1)/2 = $0.1 (in billions)

f) What will be the consumer surplus received by VC investors in this market in 2016?

CS = (AWTP - P) x Q = $4.95 x 19.8 = $98.1 (in billions)

g) What will be the producer surplus received by PE&VCs—programmers, entreprenurs, and VCs—in this market in 2016?

PS = $0

h) Explain why the surplus from this market in 2016 is divided between consumers —VC investors—and suppliers—PE&VCs—the way it is. Do you think this is fair? What would be "fair"? Do you think this is efficient? What would be "efficient"?

No. the market is not "fair". The market is only "efficient". Because producer surplus—payment about the minimum opportunity cost of $0.1 billion—is not required to get programmers, etc. to work on the societal win-win project of creating "unicorns", the competitive market in equilibrium does not offer programmers, etc. any producer surplus. Because consumer surplus—charging prices less than the maximum willingness to pay of $10 billion—is required to get investors to commit to buying the products of the societal win-win that is unicorn-creation, the competitive market in equilibrium offers lots of consumer surplus.

2) Now let us suppose that things will be different in 2016. Let's keep the same demand curve—the maximum willingness-to-pay for even a small stake in a "unicorn" on the part of the most optimistic venture capital investor is $10 billion/unicorn, and each $1 billion reduction in the price charged for a one-unicorn investment increases the number of unicorns VC investors are willing to buy by 2 unicorns:

a) What is this demand curve?

(in billions) $P_d = \$10 - Q/2$

b) What, in the year 2016, will be the supply curve—in billions of dollars, and in "unicorns" created—if the minimum opportunity cost for programmers, entrepreneurs, and venture capitalists to create even a small slice of a unicorn is $1 billion per unicorn, and if each $1 billion increase in the price gained from selling off a one-unicorn investment calls forth an extra unicorn's worth of projects?

(in billions) $P_s = \$1 + Q$

c) What will be the quantity and price in equilibrium?

Q = 6; P = $7 (in billions)

d) What will be the average willingness-to-pay of those VC investors who do invest in unicorns?

AWTP = ($10 + $7)/2 = $8.5 (in billions)

e) What will be the average opportunity cost of those programmers, entrepreneurs, and venture capitalists who create the unicorns?

AOC = ($1 + $7)/2 = $4 (in billions)

f) What will be the consumer surplus received by VC investors in this market in 2016?

CS = (AWTP - P) x Q = ($8.5 - $7) x 6 = $9 (in billions)

g) What will be the producer surplus received by PE&VCs—programmers, entreprenurs, and VCs—in this market in 2016?

PS = (P - AOC) x Q = ($7 - $4) x 6 = $18 (in billions)

h) Explain why the surplus from this market in 2016 is divided between consumers —VC investors—and suppliers—PE&VCs—the way it is. Do you think this is fair? What would be "fair"? Do you think this is efficient? What would be "efficient"?

The market is not "fair". The market is only "efficient". The producers' supply is less responsive to price than purchasers demand is. This means the price is closer to the average willingness to pay of the purchasers, so they don't receive much surplus. The price is further from the minimum needed to induce the producers to produce so they get more surplus!

3) Now let us consider a still different set of possibilities for 2016. Let's keep the same demand curve—the maximum willingness-to-pay for even a small stake in a "unicorn" on the part of the most optimistic venture capital investor is $10 billion/unicorn, and each $1 billion reduction in the price charged for a one-unicorn investment increases the number of unicorns VC investors are willing to buy by 2 unicorns:

a) What is this demand curve?

(in billions) P_d = $10 - Q/2

b) What, in the year 2016, will be the supply curve—in billions of dollars, and in "unicorns" created—if the minimum opportunity cost for programmers, entrepreneurs, and venture capitalists to create even a small slice of a unicorn is $0 billion per unicorn, and if each $4 billion increase in the price gained from selling off a one-unicorn investment calls forth an extra unicorn's worth of projects?

(in billions) P_s = $0 + Q/4

c) What will be the quantity and price in equilibrium?

Q = 13.333, P = $3.33 (in billions)

d) What will be the average willingness-to-pay of those VC investors who do invest in unicorns?

AWTP = ($10 + $3.33)/2 = $6.67 (in billions)

e) What will be the average opportunity cost of those programmers, entrepreneurs, and venture capitalists who create the unicorns?

AOC = ($0 + $3.33)/2 = $1.67 (in billions)

f) What will be the consumer surplus received by VC investors in this market in 2016?

CS = (AWTP - P) x Q = ($6.67 - $3.33) x 13.33 = $3.33 x 13.33 = $44.4 (in billions)

g) What will be the producer surplus received by PE&VCs—programmers, entreprenurs, and VCs—in this market in 2016?

PS = (P - AOC) x Q = ($3.33 - $1.67) x 13.33 = $1.67 x 13.33 + $22.2 (in billions)

h) Explain why the surplus from this market in 2016 is divided between consumers —VC investors—and suppliers—PE&VCs—the way it is. Do you think this is fair? What would be "fair"? Do you think this is efficient? What would be "efficient"?

As in (1) and (2), with the observation that this time producers' supply curve is elastic, but not infinitely so…

4) If you get this far: in which of these possible markets is the existence of PE&VCs able to create "unicorn" startup projects the most valuable to society? In which of these possible markets are PE&VCs most amply rewarded for their work and the value they add to society's collective wealth?

TOTAL SURPLUS:

1) **$98.1**
2) **$27**
3) **$66.6**

(1) is where the unicorn-creation industry is most valuable, (3) is where programmers, etc. are most highly rewarded, while (2)—in which producers are the least efficient and so have the most market power—is close behind (2) …