

First Midterm Answer Sheet

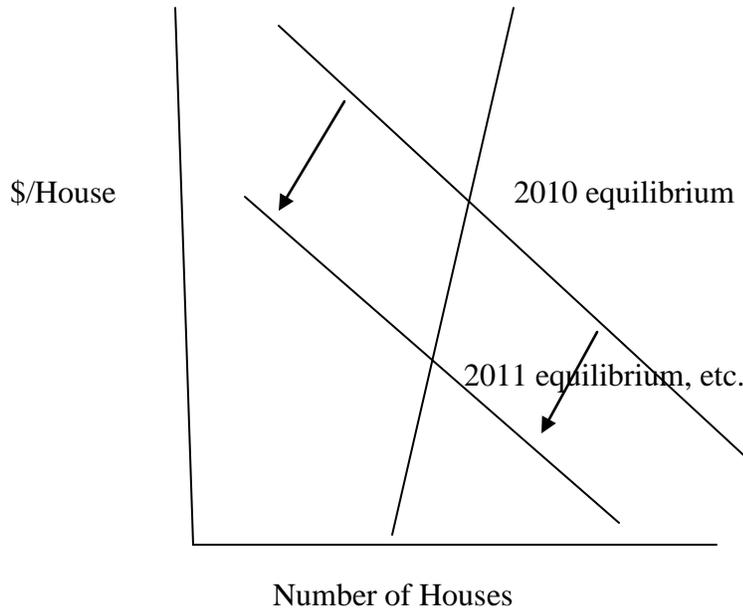
NOTE: There are often several correct ways to answer these questions. Creative, correct answers other than those shown here could receive full credit, but incomplete answers or those with flaws in reasoning could not earn full points.

1) (40 points) Optimistic price expectations were an important factor in creating and sustaining the 2000-2006 housing bubble. According to the Case-Shiller housing price index, home prices peaked in August of 2006. Since that time the Case-Shiller housing price index has fallen by 29 percent.

a) (15 points) Develop a theory of how falling house prices should have shaped housing price expectations and, through those price expectations, shaped the evolution of housing market over 2006-2010. Illustrate your theory with appropriate diagrams.

Answer: Begin with the idea that the demand function for housing includes the expected price as a “background variable”. Quantity Demanded =  $Q^D(P/\text{income}, P^{\text{Expected}}, \dots)$

As prices fall, the expected price variable falls below the current price which causes the demand curve to shift inward. Given the inelastic nature of housing supply, the inward shift of the demand curve causes a fall in the price of housing which reinforces the expectation of falling prices, etc. In sum, just as the bubble caused prices to overshoot the true equilibrium for an extended period, it is reasonable to believe that falling prices will cause the market to undershoot the true equilibrium (in both price and quantity) for an extended period. .



b) (15 points) One important dimension of the labor market is the earnings gap between high school graduates and college graduates. Develop a theory by which the 2000-2006 intense demand for housing, followed by the 2006-2010 housing demand collapse could have caused fluctuations in this gap. Explain any assumptions you make about the education levels of specific occupations and illustrate your theory with appropriate diagrams.

Answer: One approach (there may be others) is to begin with two assumptions:

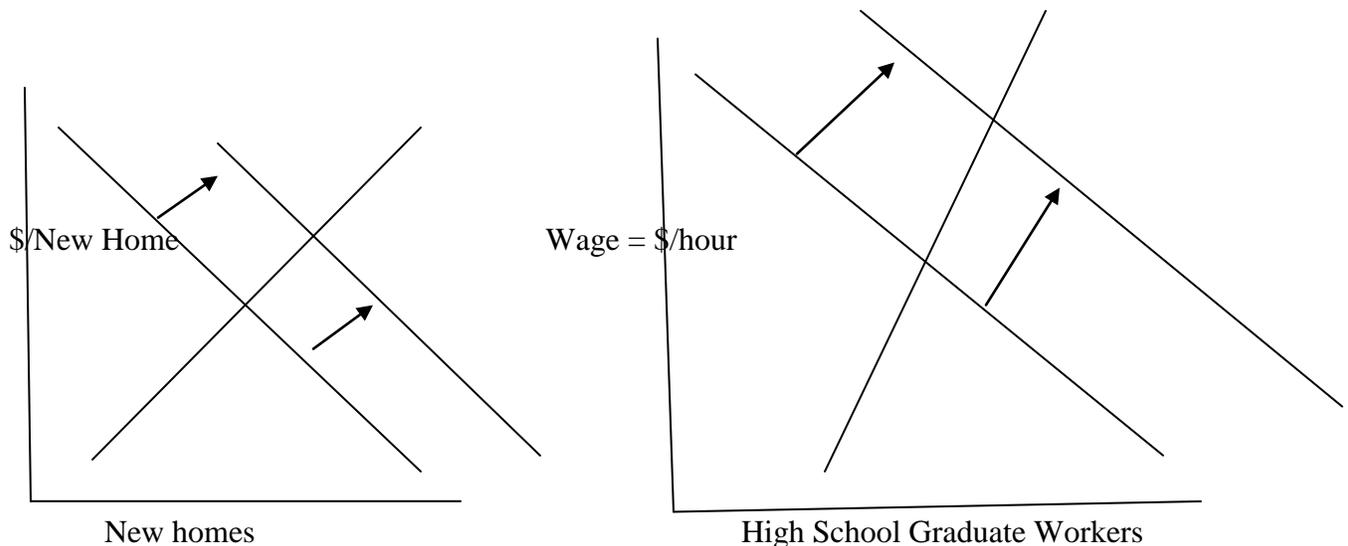
- The housing bubble encouraged significant construction of new homes.
- Construction workers employed in this new home construction typically have high school educations rather than college educations. i.e.

Quantity demanded of high school graduates =

$$Q^D(\text{wage}_{\text{HS}} / \text{level of factory activity, \# new homes being built...})$$

In this explanation, all the variation comes from movements in HS wages.

There are then two diagrams. The first is the market for **new** homes which is elastic – i.e. more demand can elicit more supply. The second is the labor market for high school graduates: as new home construction increases, demand for high school graduates increases thereby increasing the wage of high school graduates and closing the high school-college wage gap. The housing demand collapse reverses this process.



c) (10 points) Many first year MCP students drink at least one cup of coffee in the morning. Suppose that the price of a cup of coffee begins to fall over time. Do you expect the falling price of a cup of coffee to effect the cup-of-coffee market the same way falling

housing prices affected the housing market as you described it in part (a)? Explain why or why not.

Answer: There are several possible explanations. Here is one:

- We can think of the marginal utility of coffee as diminishing pretty sharply so that a second cup of coffee tomorrow is not a good substitute for a first cup of coffee today. If postponing today's coffee saved you an enormous amount of money it might be worth it to postpone but the money saved is likely to be small (compared to, say, the money saved by not buying a house if you think the price will fall by 5% over the next year).

2) (25 points) The University of Vermont is located in Burlington, Vermont. The Burlington area has a total of 2,800 hotel and motel rooms. Demand for these rooms is greatest during the university's May graduation and hotel managers let their room rates rise to meet demand. On graduation week end, all 2,800 rooms are filled and the room market is in equilibrium at \$275 per night.

a) (15 points) Suppose that on March 15, 2011, the old Hotel Devine in Burlington (300 rooms) burns to the ground. Assume that the demand curve for rooms on graduation week end has an elasticity of -1.2 at all points. Using this information, calculate the room rate hotels will now be able to charge during May graduation week end.

Answer: Using the standard elasticity formula, the relevant equation is:

$$\frac{[-300/2800]}{(\Delta P/\$275)} = -1.2 \text{ or } \Delta P = \frac{(-300/2800)*275}{-1.2} = \$24.55$$

b) (10 points) University officials suspect that the Burlington Hotel and Motel Owners Association secretly agreed to burn down the Hotel Devine in order to tighten the market for rooms and increase the total revenue going to Burlington hotels. Criminality aside, if the Hotel Motel Owners Association had followed this strategy, would it have been a smart thing to do? Explain.

Answer: You can actually calculate revenue before and after to get to the answer but the simple way to answer the question is to note that all points on the demand curve have elasticity of -1.2 and we know that with an elastic demand curve, a price increase will lose revenue. Therefore, it is not a smart idea.

3) (35 points) Twenty years ago, firms began to market "veggie" burgers, hamburger-like patties made of made of soybeans and grain. The patties were marketed as a hamburger substitute. They had the same shape as hamburgers but contained almost no fat-related cholesterol so they were healthier to eat than hamburgers.

Unfortunately, the first veggie burgers tasted like cardboard – not hamburgers. People were willing to buy a few veggie burgers because of the health benefits but people refused to buy large numbers of veggie burgers because of their taste.

Consider a man named Lou who, in 1990, had the following consumer choice problem.

Let  $V$  = the quantity of veggie burgers and  $H$  = the quantity of hamburgers.

Lou's utility can be written:  $U(V, H) = \ln(V) + 12\ln(H)$

$P_V = \$2.00$ ,  $P_H = \$4.00$ , Income = \$52.00

a) (10 points) Compute Lou's utility maximizing solution.

Answer: When we set up the equality of  $MU/P$  across commodities, we get:

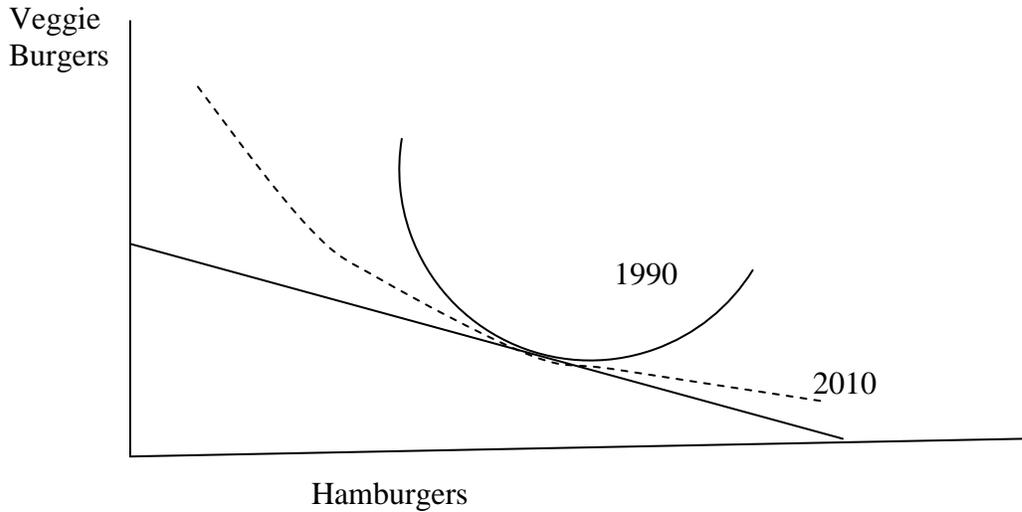
$$(1/V)/2.00 = (12/H)/4.00 \quad \text{or} \quad (1/2)H = 3V \quad \text{or} \quad H = 6V$$

Substituting into the budget constraint, we get:

$$\$2.00V + \$4.00*6V = \$52 \quad \text{or} \quad V = 2 \quad \text{and} \quad H = 12.$$

b) (15 points) Over the next 20 years, researchers continued to experiment with the taste of veggie burgers. Because of their work, the taste of veggie burgers became increasingly close to the taste of real hamburgers. How would you expect this convergence of taste to change the shape of Lou's indifference curves? Sketch a set of Lou's 1990 indifference curves and, on the same diagram, a second set that represents Lou's 2010 indifference curves. Put veggie burgers on the vertical axis and carefully explain your reasoning. (Your drawing should focus on showing changes in shapes of the indifference curves. Your 1990 indifference curves do not have to exactly need to match the function above.)

Answer: Here is one way to think about it: People seemed to like the idea of veggie burgers' health attributes but they were put off by the taste. It follows that as a veggie burger's taste gets closer to a hamburger's taste, people will regard the two burgers as closer substitutes. When thinking about indifference curves, as two products become closer substitutes, a small change in relative prices should cause a big shift to the good whose price has fallen – i.e. the indifference curves should get flatter. A rough diagram looks like this with the 2010 indifference curve in dotted lines.



c) (10 points) If the prices of veggie burgers and hamburgers remained at their 1990 levels, explain what changes, if any, you predict in each of the two markets if taste of veggie burgers improved. Use appropriate diagrams to illustrate your explanation.

Answer: You would expect the demand curve for hamburgers to shift in and become more elastic as there is now a close substitute. The demand curve for veggie burgers should move out but it may not be too elastic since it has health benefits that hamburgers don't have.

In the end, you expect that if the price for each kind of burger stays the same, the demand curve for hamburgers will continue to shift inward and everyone will buy more veggie burgers because they are now very close substitutes for hamburgers and they cost half as much as hamburgers.

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### Derivative Table

If  $Y = aX^b$  then  $dY/dX = abX^{b-1}$

If  $Y = aLN(X)$  then  $dY/dX = a/X$  where LN is the Natural Log Function.

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