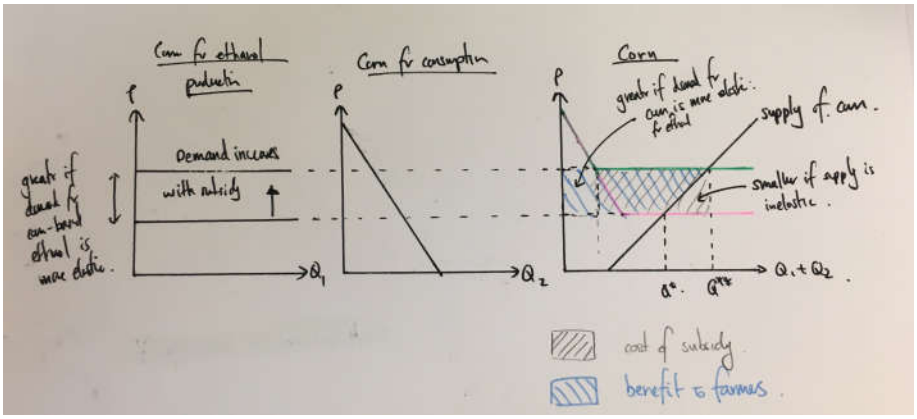
Part I
Core

1 2016/17

(i) *A subsidy to the production of ethanol from corn would likely benefit corn farmers by more than the amount of subsidy even though some of the benefits from the subsidy will go to ethanol consumers.*

Uncertain. Corn is used to produce ethanol but also is sold for consumption. This means that the price of corn is determined by the supply and the *sum* of demand for corn for consumption as well as ethanol production.

A subsidy to the production of ethanol from corn would lead to greater quantity of corn-based ethanol in equilibrium, which, in turn, would require greater quantity of ethanol as input to production—i.e. demand for corn for ethanol production increases. All else equal, this means that the total demand for corn increases so that price of corn increases. Since the price of corn is common whether it is used for consumption or production of ethanol, this means that farmers who sell corn for consumption (as well as for ethanol production) benefits from the higher price of corn.



The gain for the farmers are more likely to be greater than the amount of subsidy:

- ▷ the more elastic the demand for corn-based ethanol (as this implies greater consequential demand for corn as input for producing corn-based ethanol)
- ▷ the more inelastic is the supply of corn (as this implies smaller small cost to the government)
- ▷ the more elastic the demand for corn for ethanol production is relative to the demand for corn for consumption.

(Tak)

(ii) *An anticipated subsidy to future housing construction will raises housing rental rates in the near-term even though it will reduce housing prices and housing rental rates in the long term.*

False. Rental rents do not react in the very short run because the stock of capital is fixed. However, the price of capital will react to the subsidy. In the long run, we should see a lower

price of houses, a higher stock due to the subsidy, and a lower rental rate. The prices in the short run will go down due to the expected lower price of capital according to the formula:

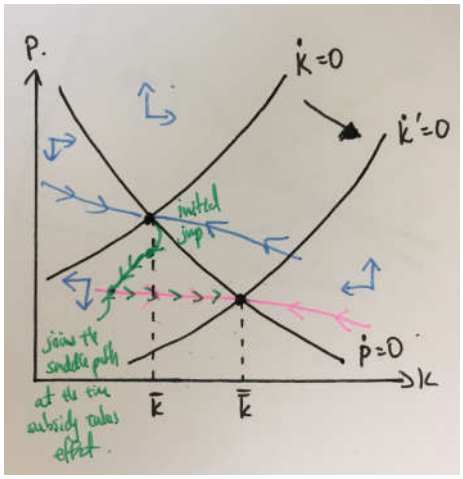
$$P_t = R_t + P_{t+1}\frac{(1-\delta)}{(1+r)}$$

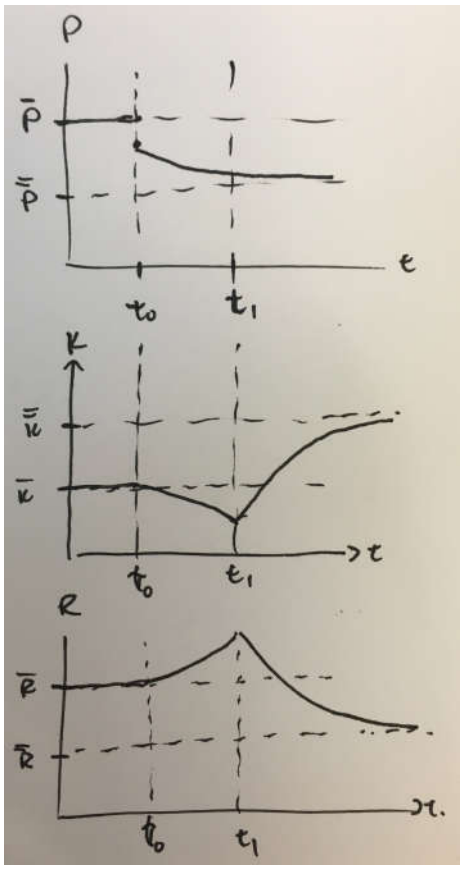
This reduction in prices reduces investment and so rental rates increase, which makes the price of capital rebound. Investment is postpone due to the future subsidy, and in the transition to the new steady state we have increasing prices and rental rates that reach a new steady state at a lower level. (EJ)

True. Future anticipated subsidy leads to postponement of investment. This means that investment today falls so that price of housing falls today. This can be seen from the formula

$$P_t = R_t + P_{t+1}\frac{(1-\delta)}{(1+r)}$$

where we can think of the subsidy as lowering P_{t+1}. Since capital is fixed in the very short run, R_t is fixed so that P_t must fall. We can then think about what happens to the price thereafter by drawing a phase diagram (in continuous time). The subsidy can be thought of as an anticipated shift out of the $\dot{K} = 0$ curve that leads to a higher steady-state capital, $\bar{\bar{K}}$, and a lower steady-state price, $\bar{\bar{P}}$ in the long run. The dynamics of the system imply that, after the initial fall in price (in period t_0, both capital and price falls until it reaches the saddle path of the new system at the time the subsidy is introduced (in period t_1). Then, the system converges to the new steady state, with prices falling and capital increasing during the transition stage. Between periods t_0 and t_1, since capital stock is falling, rental rates must be rising. After the subsidy is introduced and as capital begin increasing, then the rental rates will fall to the (lower-than-before) steady-state level. (Tak)





(iii) *Higher costs for labor will reduce measured profits for an industry with constant returns to scale if there are adjustment costs to capital.*

False. (I have troubles reconciling CRS and adjustment costs. Is its constant marginal cost but in presence of a fixed cost? My answer assumes that and so marginal cost and average cost could be different) The firm could have higher profits if the demand is inelastic enough and its average cost increases less than marginal cost because some factors are fixed. Then, in the short run (defined as the period in which there is a fixed cost) profits could actually increase due to higher labor costs if capital is fixed. The later is consistent with the existence of adjustment costs to capital. In the long run we should expect that profits are lower because average and marginal costs are the same. (EJ)

Uncertain. Recall that with constant returns to scale, measured profits, given by:

$$F(K, L) - wL - rK$$

is zero and that labour cost/capital cost ratio is constant; i.e.

$$\frac{wL}{rK} = x,$$

for some constant x. Suppose the industry experiences an increase in w to $\hat{w}$ while r remains constant. Then, profit maximisation implies that thew new capita-to-labour ratio, $\hat{K}/\hat{L}$ ratio must satisfy

$$\frac{\hat{w}\hat{L}}{r\hat{K}} = x \Rightarrow \frac{\hat{K}}{\hat{L}} = \frac{\hat{w}}{w}\frac{K}{L},$$

where, in general, $\hat{K} \neq K$ and $\hat{L} \neq L$.

Adjustment cost to capital implies, not only that the firms incur costs in adjusting capital level to the new profit maximising point, but that the firm adjustsin small increments (rather than through large, discrete changes). Hence, during the transition period, it would appear as if the firm is not operating at the profit maximising combination of K and L. That is, measure profits will be lower. However, in the long-run, we would find that measure profits converges to zero. Thus, the answer to the question depends on the time horizon that w consider when assessing measured profits. (Tak)

(iv) *Stricter enforcement of drug trafficking laws will reduce the profits of drug suppliers and induce suppliers to exit the industry.*

Uncertain. We need to consider the short-run (SR) and long-run (LR) demand. If we adopt the rational addiction model, then demand is likely to be inelastic in the SR due to the effect of addiction, but elastic in the long run, as drug users can choose to stop taking drugs. Moreover, if we think of the suppliers as being a monopolist, then for them to exist in the market, it must be that demand must be elastic in the long run (remember, inelastic demand means marginal revenue is negative, while elastic demand means marginal revenue is positive). This also means that price is set by the suppliers according to the LR demand curve—the price give by the demand curve at the quantity where the marginal revenue curve intersects with the marginal cost curve.

Stricter enforcement of drug laws increases the marginal cost of supplying one unit of drugs, so that price increases in the SR. Given that the demand is inelastic (so that higher price does not lead to large reductions in quantity demanded), profits increases in the SR.

However, lower quantity demanded may reduce LR demand (since the "degree" of addiction would be lower). In addition to the higher cost, this would reduces the monopolist supplier's profits in the LR. Depending on the relative size of the SR gain in profits versus the LR loss in profits, the stricter enforcement may or may not result in suppliers exiting the market.

If we think that suppliers operate oligopolistically, then we know that they would benefit if only they could form a cartel and restrict supply. To the extent that stricter law enforcement reduces supply (e.g. drug depot are more likely to be "busted" by the police), such a reduction in supply could mimic the effect of forming a cartel—and so it may lead to increased profits in the LR. (EJ/Tak)

(v) *A finding that the use of bus travel declines in response to an exogenous increase in wage rates (holding all goods prices fixed) generated by a randomized experiment, i.e. than an experiment increases the wages for a random group from a sample of workers without affecting the wages (or use of bus travel) for the control group, would be good evidence that bus travel is an inferior good for this group of individuals.*

False. An inferior good is one in which the income elasticity is negative (i.e. the demand for the good decreases as income increases).

Notice that the increase in wages has both an income effect *and* substitution effect. That is, higher wages not only increase income, but it also increases the cost of time (e.g. commuting/leisure) which might lead to lower demand for bus rides. Thus, the difference in the treatment and the control group we observe for the use of bus ride (i.e. demand for bus rides) is an amalgamation of these two effects. Then, even if bus rides are normal goods (i.e. demand increases with income), we could see the treated individuals taking fewer bus rides if the substitution effect is sufficiently large.

Hence, we cannot conclude whether bus rides are inferior or normal even if we observe a difference between the treated and the control group unless we can be sure that the substitution effect is negligible. (EJ/Tak)

(vi) *Individual-level labour supply elasticities are likely to exceed the corresponding macro-level responses because there is less substitution possibilities in the aggregate.*

False. Aggregate labour supply elasticity takes into account both the intensive (i.e. how much to work) and the extensive (i.e. whether to work) margins of labour supply decisions. In contrast, individual-level labour supply elasticities can be measured only on the intensive margin. Therefore, aggregate labour supply tends to be more elastic than individual-level labour supply.

If we consider a worker at the extensive margin that faces a reduction in wages, the fall in wages would make him leave the labour force and so that his labour supply elasticity is close to infinity. This is clearly greater than the macro-level response to the same fall in wages. (This means that we should expect a change in wages to have a lower impact on hours worked for an individual at the intensive margin than for the aggregate.)

But notice that, even in this case, individual-level labour supply elasticities exceeds the macro-level response not because there is less substitution possibilities in the aggregate. So the statement is false. (EJ/Tak)