

Recitation Session

Labour Economics

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Easter Term 2010

- Labour Supply
 - People
 - Households
- Labour Demand
 - Firms and optimisation
- Equilibrium
 - Wages
 - Taxes

In class, April 7!

Labour Economics: Quiz

- 1 An individual has the following utility function $u(c, l) = 2cl^{1/2}$, where c is consumption and l is leisure. The individual has an endowment of V in non-labour income and T hours to either work (h) or use for leisure (l).
 - 1 Calculate the marginal utility of leisure, the marginal utility of consumption, and the marginal rate of substitution for this individual.
 - 2 Write the individual's budget constraint.
 - 3 Write the tangency condition for the individual's optimisation problem.
- 2 Assume immigrants and natives are perfect substitutes, and that natives' labour supply is given by $n_1 S(w)$, where n_1 is the size of native population, $S(w)$ is the supply curve of a native. Suppose $n_2 = n_1$ immigrants are allowed to enter the economy. Use a graph to illustrate the effect of this influx in case
 - 1 immigrant supply function is identical to natives,
 - 2 immigrant labor supply is perfectly inelastic.

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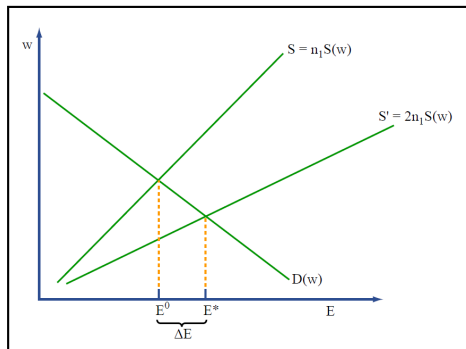
Solution

$$\text{Old } S = n_1 S(w)$$

$$\text{New } S = n_1 S(w) + n_2 S(w) = (n_1 + n_2) S(w) = 2n_1 S(w)$$

Graphically, this makes the new supply curve flatter.

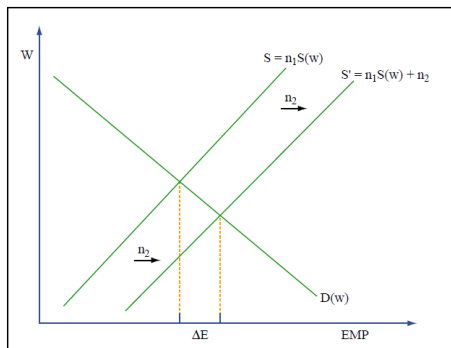
- 2.
1. immigrant supply function is identical to natives



$$E^* = 2n_1 S(w)$$
$$\frac{E^*}{2} = n_1 S(w) = \text{new native employment}$$
$$E^0 - \frac{E^*}{2} = \Delta \text{ native employment}$$

2.

2. inelastic supply



Here employment changes by $\Delta E < n_2$ as natives reduce their LS in response to wage reduction. changes native employment

Firm's problem

Optimisation

A firm has the following production function

$$q = f(L, K) = 4L^{1/2} + 2K^{1/2}.$$

- 1 Compute the firm's MP_L , MP_K , and $MRTS$.
- 2 Write the profit maximisation problem for the firm.
- 3 Calculate the profit maximising level of labour demand (L^*) as a function of the output price p and input prices (w and r).
- 4 Calculate the profit maximizing level of capital demand (K^*) as a function of output price p and input prices (w and r).
- 5 Assume $p = 4$, $w = 1/2$; and $r = 3$. Calculate the profit maximising level of labour demand (L^*), capital demand (K^*), and output (q^*). How much profit is the firm making?
- 6 Calculate the labour demand elasticity with respect to wages (a function of L^* , w , p , and r). What is the labour demand elasticity at $w = 1/2$, $r = 3$, and $p = 4$?

Subsidies and Labour Supply

Compare and contrast the labour supply implications of the following programs:

- 1 A “child allowance,” i.e., an annual lump-sum tax credit for anyone with children
- 2 A “child allowance” for working women with incomes below the poverty line. The credit phases out at higher incomes.
- 3 Subsidised daycare-center-provided care for the children of working women
- 4 Subsidised daycare-center-provided care for all children

1. A “child allowance,” i.e., an annual lump-sum tax credit for anyone with children
 - 1 Because everyone gets the same lump-sum tax credit no matter how much they work, this policy does not change the effective wage rate and thus there is no substitution effect. There is an income effect, which, since leisure is a normal good, leads women to work less at every hours level.

2. A “child allowance” for working women with incomes below the poverty line. The credit phases out at higher incomes.
 - ① Women who are not working may start working very few hours to get the benefit.
 - ② For women who are working but already below the poverty line, this policy leads to an income effect which causes them to work less.
 - ③ Women who are between the poverty line and the breakeven face a positive tax rate due to the phase-out. Thus, the return to labour decreases under this policy. These women face both a substitution effect and an income effect which causes them to work less.
 - ④ Women right above the breakeven will, with conventional preferences, reduce their labour supply to get a (small) child allowance.
 - ⑤ There will be no labour supply effects for women far enough above the breakeven.

3. Subsidised daycare-center-provided care for the children of working women
 - 1 Because women must pay for child care for every hour they work, before the policy, their effective wage was $w - c$ where c is the cost of child care. The subsidised day care in this policy is cheaper: it costs $c' < c$. Thus, after this policy, the wage for women is effectively $w - c' > w - c$. This higher wage causes both an income effect which reduces labour supply and a substitution effect which increases it. Thus, the labor supply effects for most women are ambiguous.
 - 2 However, women who are currently not working only face a positive substitution effect, so some of them will start working.

4. Subsidised daycare-center-provided care for all children

- 1 All non-working women who would buy some child care at the subsidised price and all working women face an income effect which reduces labour supply. These women who would buy child care for the marginal hour of leisure if they decide not to work another hour do not face a substitution effect, so their labour supply will decrease.
- 2 However, these women who would not buy an hour of child care for the marginal hour of leisure face a positive substitution effect which causes them to work more. For these women, labour supply is indeterminate. Non-working women who would not buy some child care at the subsidised price only face a substitution effect, so their labor supply will increase.