Suggested Answers Problem Set 6
ECON 40447

Bill Evans
Fall 2009

1. A graph for this problem is at the end of the answer key. Market equilibrium: W_d=W_s, or 200-(4/5)L=50+(1/5)L, 150=L. Substituting 150 back into the supply schedule,W_s=50+(1/5)L=50+(1/5)150=$80.

   A per-worker tax on workers hired shifts the demand schedule down by an amount equal to the per unit tax, so W_d^* = W_d-$10=190-(4/5)L or W_d^* =190-(4/5)Q. The new market equilibrium is where W_d^* = W_s or 190-(4/5)L = 50+(1/5)L, so L= 140. Substituting this back into supply, we get that firms receive 50+(1/5)140 = $78 for each worker

   Tax revenues are tL = $10(140) or $1400. Firms pay $78 to workers in the form of higher wages and an additional $10 work in taxes, so the cost of hiring a worker has increased from $80 to $88. Therefore, the portion of the tax paid by employers is $(88-$80)140 = $1120. Notice that the wage received by workers is now only $78 so the portion of the tax paid for by workers is ($80-$78)140 = $280.

   The deadweight loss is the area of the triangle (abc) or one half height times base. The base is $10 (the amount of the tax) and the height is the the difference between 150 and 140 units, so the DWL is (0.5)(10)(10) = $50.

2. Market equilibrium is where W_s=W_d or 50+0.15L = 200 - 0.1L, or 150=0.25L, L=600. Substitute L=600 back into supply to get market wage, 50+(0.15)(600) = $140.

   With the mandate, demand for workers will fall by a vertical distance equal to $10, or W_d - 10=200-0.1L, so W_d*=190-(0.1)L.

   If the workers do not value the mandate at all, the supply curve will not shift at all, so the new equilibrium would be W_d* = W_s or 190-0.1L = 50+0.15L, 140=0.25L, L=560. Substitute this back into the supply curve and workers receive wages equal to 50+(0.15)(460)=$134, but firms pay $144 per worker.

   If the workers value the mandate at $v/day, the supply curve will shift down by an amount equal $v. In this case, $v=5 so W_s -$5 = 50+(0.15)L, W_s^*=45+(0.15)L. The new market equilibrium is W_s^*=W_d^* or 190-(0.1)L=45+(0.15)L or 145=0.25L so L=580. Firms pay workers a wage of 45+(0.15)(580)=$132. Workers value the job at $137/day and firms pay $142/day.

3. Consider a market in equilibrium. Market demand is D, market supply is S and the

market clearing wages and employment are W_1 and L_1 respectively. Suppose that firms are already providing health insurance and the market demand and supply are the curves that exist in this situation. Now suppose that the cost of providing health insurance increases by K dollars per worker. This will drop the demand curve by a vertical distance equal to K. In this case, assume that health insurance costs increase because new (and expensive) technologies have been introduced which are valued by workers. Suppose also that workers value the insurance more because of the increase in costs and they value the amount at M. This will drop the supply curve down by a vertical distance equal to M. In this case, I've assumed that M<K. The new equilibrium is where the new supply (S-M) intersects the new demand (D-K) which is at W_2 and $L_{2.}$ Notice that the wage received by workers has fallen from W_1 to $W_{2.}$ But because they are now receiving health insurance that is of greater value than before, the true compensation is W_2+M. Notice also that the wage cost of hiring workers has fallen to W_2 but the true cost has increased to W_2+K because of the increased cost of health insurance.

In this case, note that most of the cost of greater health insurance is paid for by workers in the form of lower wages.

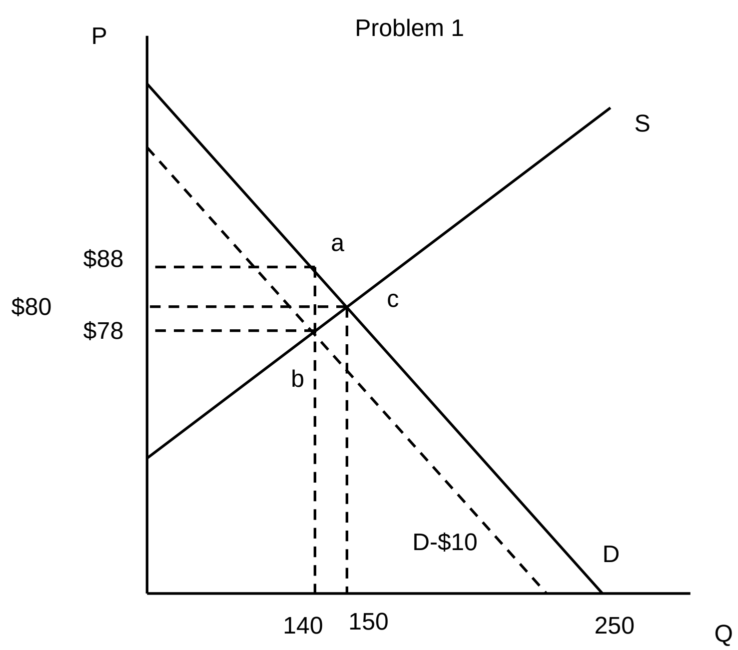
In the next graph, I consider a situation where the workers value the increased cost of the health insurance by an amount K, the exact amount that firms are now paying more for insurance. In this case, the supply curve shifts down by an amount K and intersects the new market demand at the old level of employment of L_1. The market clearing wage has fallen to W_2 which equals W_1-K. In this case, the increased cost of health insurance is paid for entirely by a drop in worker wages.

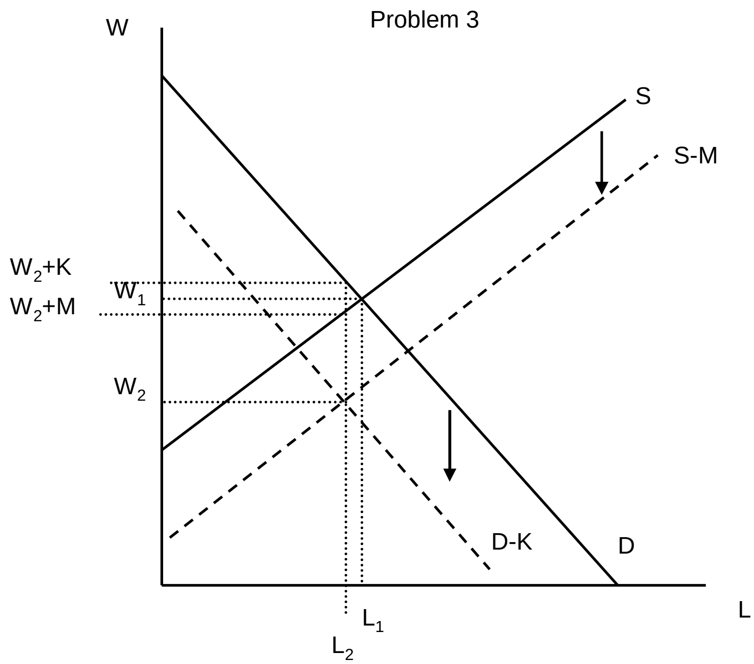
4. Consider the results in the previous question. If workers value health insurance, then increasing costs of insurance will be born primarily by workers in the form of lower wages. In the second case we considered in problem 3, we saw that ALL of the higher costs of insurance are paid for by lower worker wages. Therefore, the high cost of insurance should not place GM at a competitive disadvantage – it should simply reduce the wages received by workers.

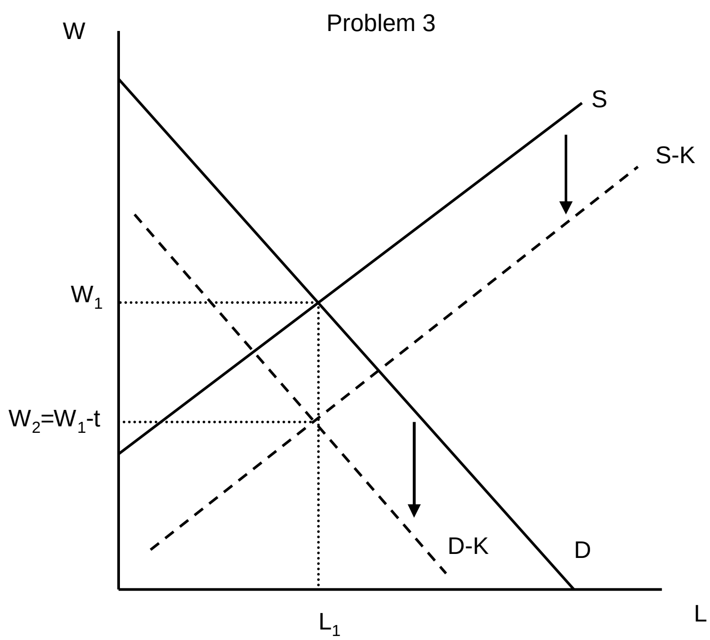
5. Assume part time and full time workers are substitutes. Market equilibrium is defined as points a and b in the full and part time graphs respectively. With an employer mandate and assuming full time workers value the mandate at some amount less than the cost, the demand curve for full time workers shifts down by the cost of the mandate and the supply curve shifts down by an amount equal to what workers value he mandate. The new equilibrium is now point c. Note that the full cost of hiring a full time worker has increased from W1 to W2+t. Because full time jobs are now more attractive, people will shift out of part time work, meaning that supply curve for part time work will shift up and to the left. Likewise, because the price of full time working has increased, the demand for part time workers will shift up and to the right. The new equilibrium is point d.

6. Since the market clearing wage that would prevail in the absence of a minimum wage is below that value, the minimum wage is binding and workers are paid $7.50/hour. With the employer mandate, the cost of hourly work would increase by $2.5/hour which is a 33% increase in labor costs. Given the elasticity of demand, an increase in employment costs of 0.33 would reduce employment by (-0.25)(0.33) = 0.0825 or 8.25%. Since baseline employment is 1 million, this mean that employment will fall by 82,500.

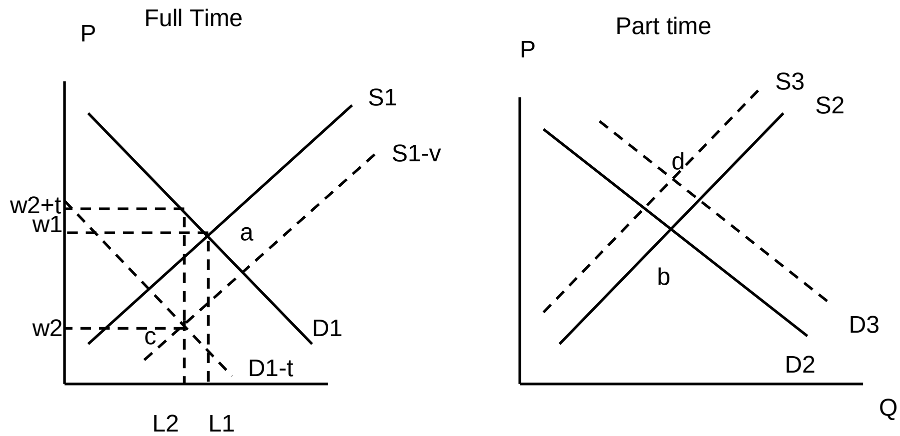
7. A graph for the answer is below. The pay-or-play mandate will reduce demand for workers by a vertical distance equal to the tax ($2.5/hour). In the absence of a minimum wage, we would expect the wage to fall to $6.5/hour ($9 - $2.5) as a result of the mandate as workers bear the entire burden of the tax. However, with the minimum wage of $7.50, wages can only fall to that level, meaning that workers will pay for some of the mandate in the form of a $1.50 wage drop, but that firms will have to pay for an additional $1/hour cost of the mandate in the form of higher per hour costs. Reading up vertically from the new demand to the old demand, this is the same demand that would be purchased if prices rose from $9 to $10/hour. This is an 11% rise in price and given the elasticity of demand, this would generate a -0.0275 or a 2.75% reduction in demand.




Problem 3
W
S
S-M
W2+K
W1
W2+M
W2
D-K
D
L1
L2
L


Problem 3
W
S
S-K
W1
W2=W1-t
D-K
D
L1
L

Problem 5



Problem 7