

Problem set 5, due Tuesday 11/12/13

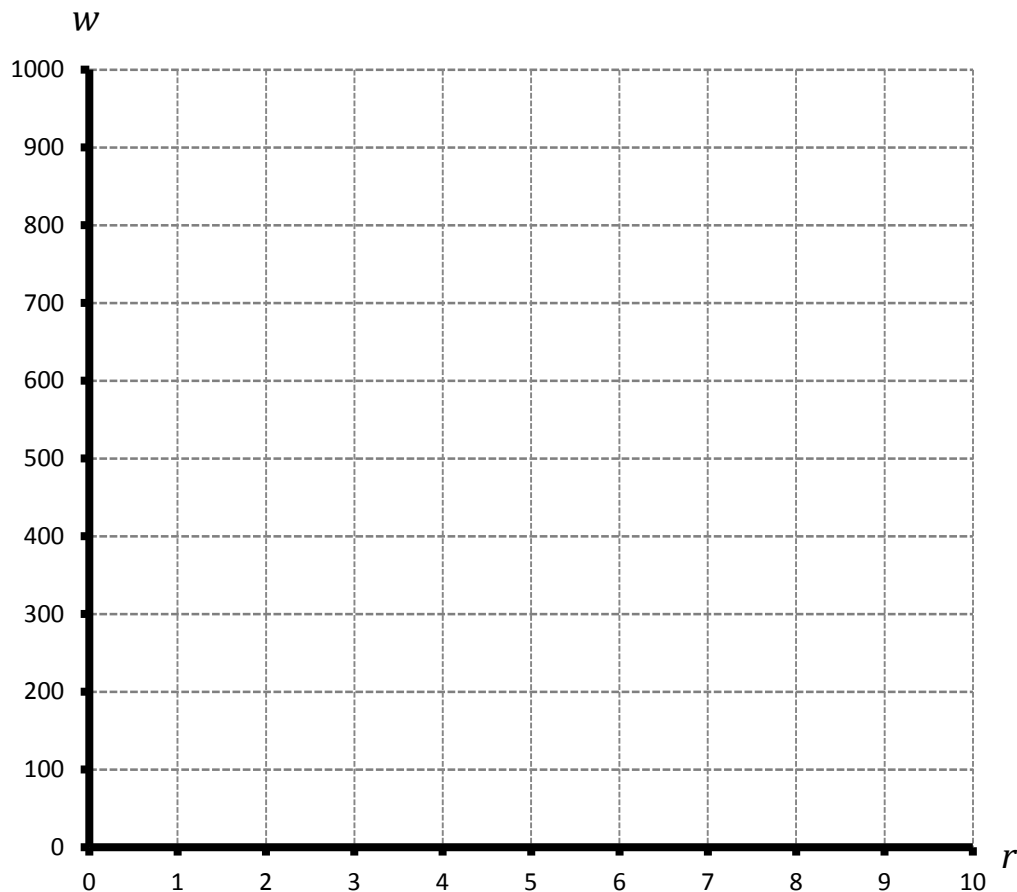
Compensating wage differentials. Suppose that there are two kinds of workers, and two kinds of firms. Workers of type A have the utility function $U_A = w - 40r^{3/2}$, and workers of type B have the utility function $U_B = 2 - w - 10r^{3/2}$, where w is the wage they receive, and r indicates the level of on-the-job risk. Firms of type X have the per-worker profit function $\Pi_X = 120r^{1/2} + 300 - w$, and firms of type Y have the per-worker profit function $\Pi_Y = 270r^{1/2} - w$. Suppose that firms are perfectly competitive, to the point of earning zero profit per additional worker, and workers can choose any risk-wage combination that satisfy this zero profit constraint.

- a) Which type of worker is more risk averse? _____
- b) For which type of firm is it less costly to reduce on-the-job risk? _____
- c) Find $w_X(r)$ and $w_Y(r)$, the wages that the firms of each type can offer as a function of risk.
- d) If a worker of type A works at a firm of type X, what risk-wage combination will they choose? How much utility will they get as a result?
- e) If a worker of type A works at a firm of type Y, what risk-wage combination will they choose? How much utility will they get as a result?
- f) Which type of firm does a worker of type A prefer to work for?
- g) If a worker of type B works at a firm of type X, what risk-wage combination will they choose? How much utility will they get as a result?
- h) If a worker of type B works at a firm of type Y, what risk-wage combination will they choose? How much utility will they get as a result?

i) Which type of firm does a worker of type B prefer to work for?

j) If the government made a workplace risk level greater than $r = 1$ illegal, how would this affect the workers' utilities?

k) On the graph below, draw the isoprofit curves that represent $\Pi_X = 0$ and $\Pi_Y = 0$. For each worker, mark the point that they would choose along the isoprofit curve of each firm, and sketch the indifference curve corresponding to the utility they receive at that point.



l) This exercise illustrates the idea that, under certain conditions, safety regulations *can* reduce ax-ante worker utility. With that in mind, what are the arguments for safety regulations?