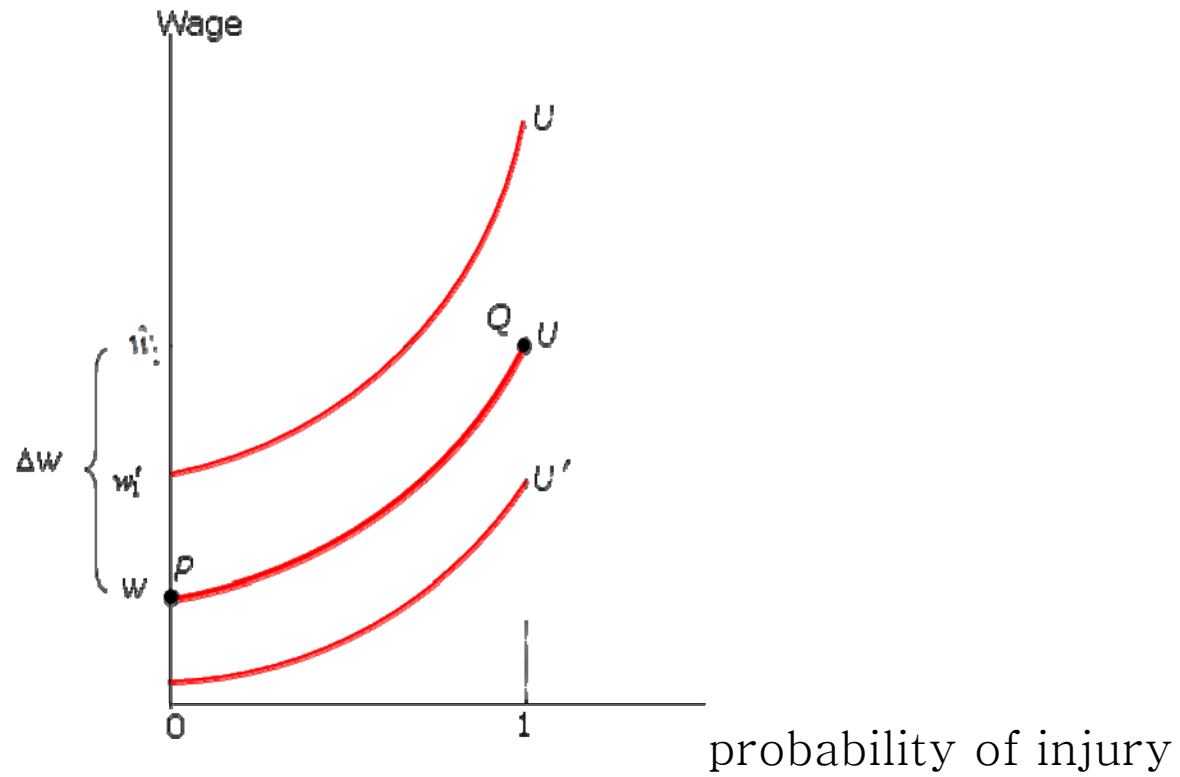


Compensating Wage Differentials

- In the model of competitive labor markets, there will be a single wage in the economy if all jobs are alike and all workers are alike in terms of productivity.
- However, the labor market is not characterized by a single wage since workers are different and jobs are different.
- We consider a job offer in terms of the entire job package that includes both wages and working conditions.
- We examine the impact of differences in these job amenities on the determination of wages and employment.

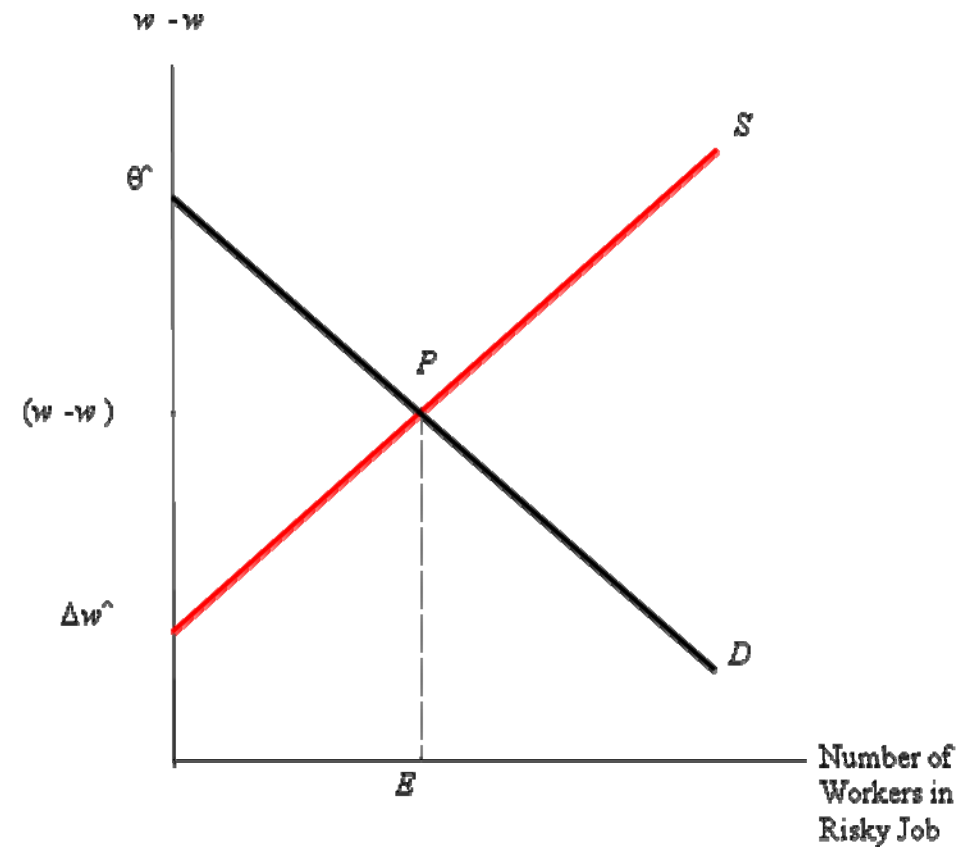
- Adam Smith proposed the idea that job characteristics influence labor market equilibrium.
- Compensating wage differentials arise to compensate workers for nonwage characteristics of the job.
- Workers have different preferences and firms offer different working conditions.
- The theory of compensating wage differentials provides a guide line for determining wage differentials among workers.

[Figure 1] Indifference Curves between Wage and Probability of Injury on Job



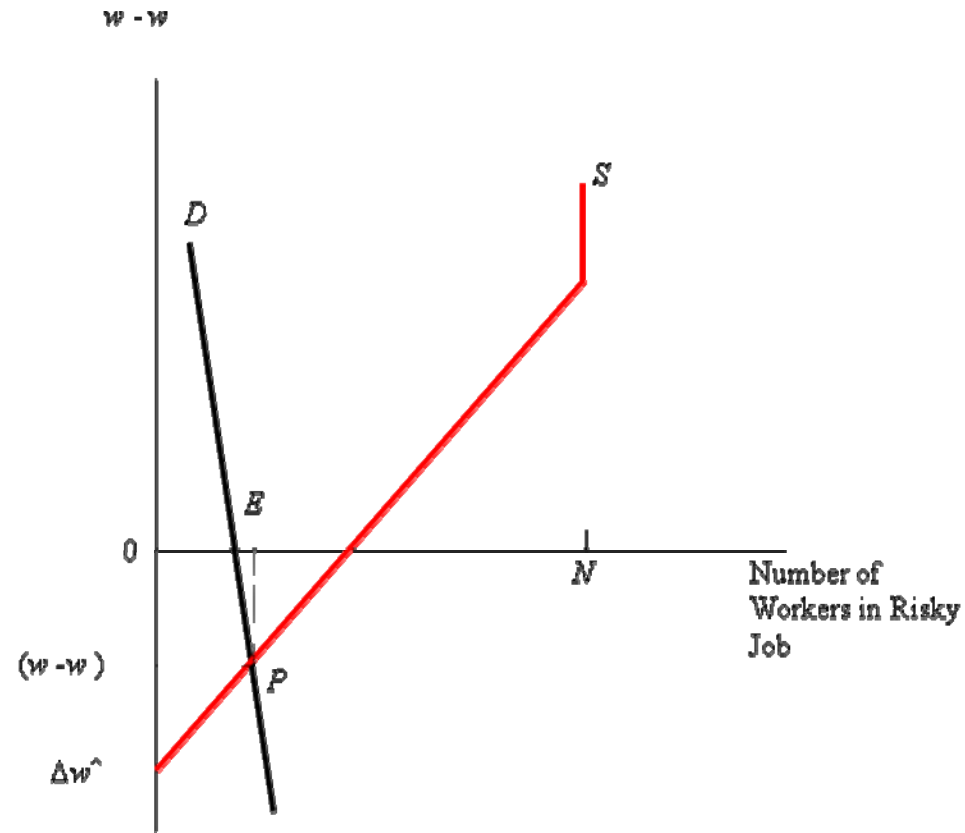
- The worker earns a wage of w_0 and gets U_0 utility if she chooses the safe job.
- She would prefer the safe job if the risky job paid a wage of w_1' , but would prefer the risky job if that job paid a wage of w_1'' .
- The worker is indifferent between the two jobs if the risky job pays w_1^{\wedge} .
- The worker's reservation price is then given by $\Delta w = w_1^{\wedge} - w_0$.

[Figure 2] Determining the Market Compensating Differential



- The supply of labor to risky jobs slopes up because as the wage gap between the risky job and the safe job increases, more and more workers are willing to work in the risky job.
- Different firms will typically have different technologies for producing safety.
- The demand curve slopes down because fewer firms will offer risky working conditions if risky firms have to offer high wages to attract workers.
- The market compensation differential equates supply and demand, and gives the “bribe” required to attract the last worker hired by risky firms.

[Figure 3] Market Equilibrium when Some Workers Prefer Risky Jobs

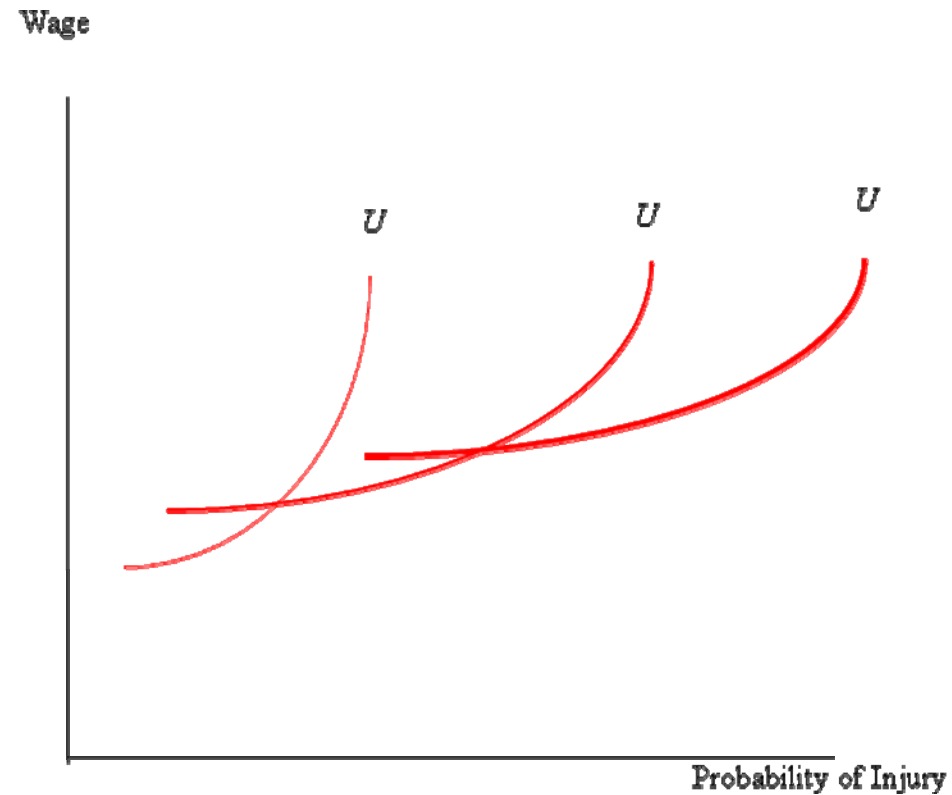


- If some workers like to work in risky jobs (i.e., they are willing to pay for the right to be injured) and if the demand for such workers is small, then the market compensating differential is negative.
- At point P , where supply equals demand, workers employed in risky jobs earn less than workers employed in safe jobs → the market differential go in the opposite direction.
- For example, it turns out that lawyers in the so-called public sector earn almost 50 percent less than lawyers doing more traditional legal work.

Hedonic Wage Equation

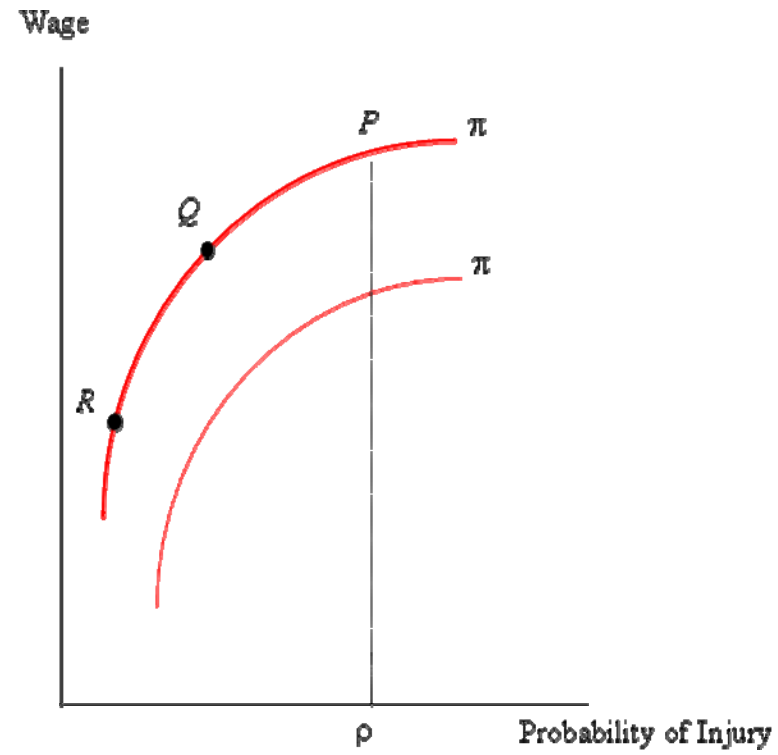
- The simple model in the previous slides illustrates the key insights of the compensating wage differential hypothesis in a labor market where there are only two jobs, a risky job and a safe job.
- Instead of having only two types of jobs, we consider the probability of injury on the job being continuous numbers between 0 and 1.
- We try to find out the relationship between the wage and workers get paid and job characteristics → so called “hedonic wage equation”

[Figure 4] Indifference Curves for Three Types of Workers



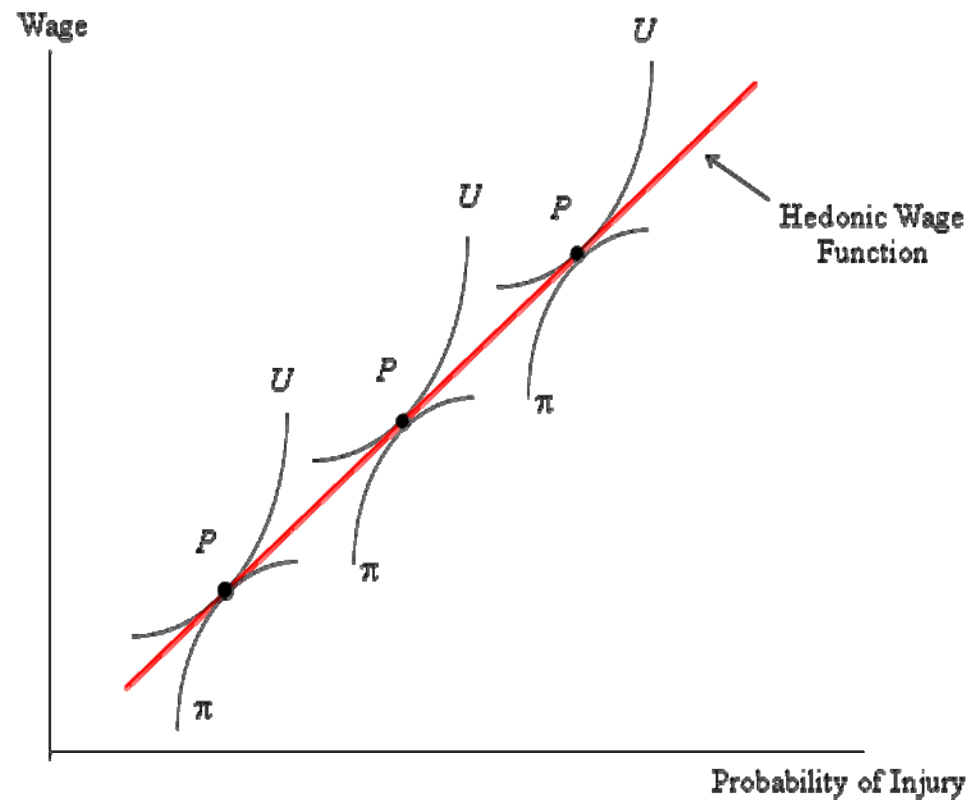
- Worker A is very risk-averse and Worker C does not mind risk as much.

[Figure 5] Iso-Profit Curves



- An iso-profit curve gives all the risk-wage combinations that yield the same profits.
- Because it is costly to produce safety, a firm offering risk level ρ^* can make the workplace safer only if it reduces wages (while keeping profits constant) \rightarrow the iso-profit curve is upward sloping.
- Note that higher iso-profit curves yield lower profits \rightarrow given the same probability of injury, firm is paying higher level of wage (cost).

[Figure 6] The Hedonic Wage Equation



- Different firms have different iso-profit curves and different workers have different indifference curves.
- The labor market marries workers who dislike risk (such as worker A) with firms that find it easy to provide a safe environment (like firm X); and workers who do not mind risk very much (worker C) with firms that find it difficult to provide a safe environment (firm Z).
- The observed relationship between wages and job characteristics is called a hedonic wage function.
- Because workers dislike risk and it is expensive to provide safety, the slope of hedonic wage equation is upward sloping.

Policy Application: How much is a Life worth?

- Many studies estimate the hedonic function relating wages and the probability of injury on the job.
- These studies estimate the wage difference that exist across jobs that offer different probabilities of risk, after adjusting for other factors that might affect wage differentials → require regression analysis of traditional wage equation having working conditions.
- Many empirical studies report a positive relation between wages and hazardous or unsafe work conditions.

- Workers who are exposed to hazardous material or equipment earn about 3 to 4 percent more than workers who are not → use survey having working conditions.
- Similarly, workers in jobs that involve physical stress earn about 6 percent more than workers in other jobs.
- Workers who are exposed to high probabilities of fatal injuries earn more.

Practical Issues in Estimating Hedonic Wage Equation

- Hedonic model clearly applies to many other job characteristics, such as whether the job involves repetitive and monotonous work, whether the job involves strenuous work.
- The key implication → As long as all persons in the population agree on whether a particular job characteristic is a “good” or a “bad”, bad job characteristics are associated with high wage rates.
- The empirical studies in this literature typically estimate the hedonic wage function by correlating a worker’s wage with various job characteristics after adjusting other factors.

- However, an extensive survey of the evidence concludes that “test of the theory of compensating wage differentials are inconclusive with respect to every job characteristics except the risk of death.”
- For example, jobs that requires workers to have substantial physical strength often pay less.
- The source of “wrong direction” is so called “ability bias”
- The estimates of the compensating wage differentials associated with particular job characteristics are valid if all other factors that influence a worker’s wage being held constant.

- More able workers choose jobs having better working conditions → it leads to a positive correlation between good jobs and high wages.
- How to control for this “ability bias”
- Because a worker’s innate ability does not change from job to job, the correlation between the change in the wage and the change in the job amenity isolates the impact of compensating wage differentials → fixed effects model gives more consistent results.
- However, the correlation between innate ability and choose of new jobs?