

## Compensating Wage Differentials

*Mariola Pytliková*

VŠB-Technical University Ostrava,

CReAM, IZA, CCP and CELSI

*Info about lectures:* <http://home.cerge-ei.cz/munich/labor14/>

*Office hours:* by appointment

*Contact:*

Email: [Mariola.Pytlikova@vsb.cz](mailto:Mariola.Pytlikova@vsb.cz)

Mobile: 739211312

VŠB-Technical  
University Ostrava

## Study Materials and Reading List

*Compulsory:*

- Borjas: Labour Economics; Chapter 5 on compensating wage differentials
- **Slides of the lectures** (provided 1 day in advance or on the day of the class)

*Optional:*

- Krueger, Allan and David Schkade. (2008). Sorting in the Labor Market: Do Gregarious Workers Flock to Interactive Jobs? *The Journal of Human Resources* Vol. 43, No4, Fall 2008.
- Cole, M. A., Elliott J. R., and J. K Lindley. (2009). Dirty Money: Is there a wage premium for working in a pollution intensive industry? *Journal of Risk and Uncertainty* 39 (October 2009), pp. 161-180.
- Daniel S. **Hamermesh, 1999**. "Changing Inequality in Markets for Workplace Amenities," *The Quarterly Journal of Economics*, MIT Press, vol. 114(4), pp. 1085-1123
- G. Duncan and B. Holmlund. (1983) "Was Adam Smith Right After All? Another Test of the Theory of Compensating Differentials" *Journal of Labor Economics*, vol. 1 , pp. 366-79.

- All materials provided on: <http://home.cerge-ei.cz/munich/labor14/>

VŠB-Technical  
University Ostrava

## Compensating wage differentials

- A theory of supply of workers to labor activities that are differentiated by wage and non wage attributes
- Attributes can be positive or negative
  - Working environment (safety)
  - Amenities (comfort)
  - Non-pecuniary benefits (short commute)
  - Consumption by-products of work (prestige, shame)
- As in standard models, price (wages) achieves equilibrium
- The main difference is that equilibrium serves as a *matching or sorting function*

VŠB-Technical  
University Ostrava

## Job Matching

- The labor market must solve a marriage problem: the right worker is wed to the proper job
- Labor transactions can be viewed as a tied sale
  - Worker rent his labor service to the firm
  - Buys attributes of the job
- Major function of the labor market: provide signals and mechanisms by which workers are matched to employers
- Workers have different skills and preferences, firms have different job offers and working environments
- Firms max profits
- Workers max utility: monetary and non monetary benefits matters
- Focus today: how the labor market accommodates workers preferences
- Because jobs and employers differ, workers' decision to take a job in firm will not solely be based on pay.

VŠB-Technical  
University Ostrava

## Theory of Compensating Wage Differentials

- This theory suggests that wage differentials exist, in part, to compensate workers for non-pecuniary characteristics of alternative types of employment like adverse working conditions
- Provides one explanation of wage differences across individuals and across occupations
- The theory of compensating wage differentials was first expressed in detail in 1776 by Adam Smith in the Wealth of Nations

*"The wages of labour vary with the ease or hardship, the cleanliness or dirtiness, the honourableness or dishonourableness of the employment"*

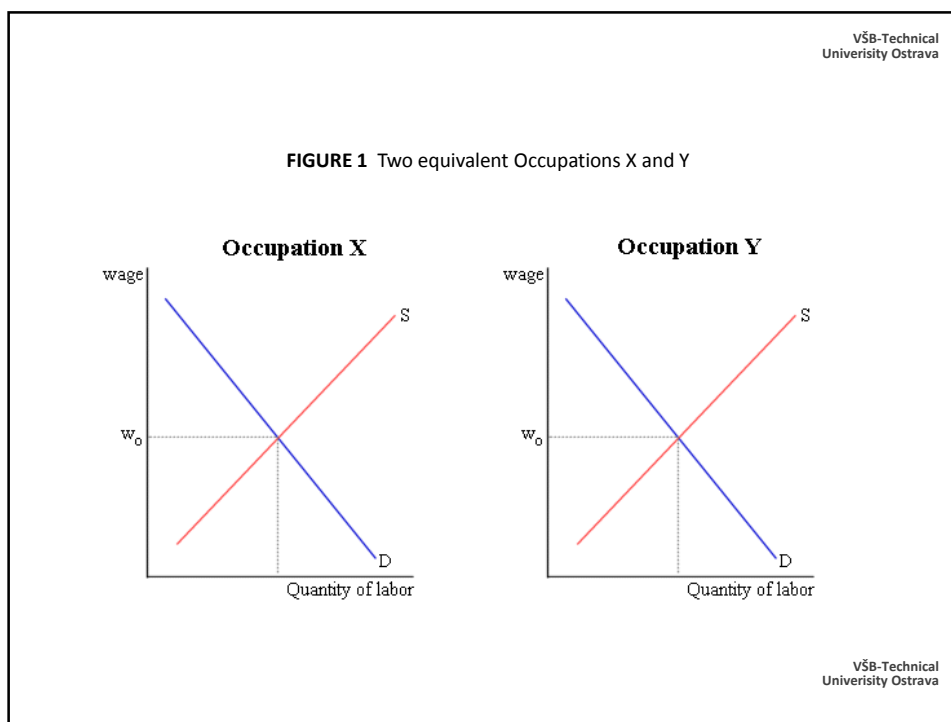
VŠB-Technical  
University Ostrava

5

## Compensating wage differentials

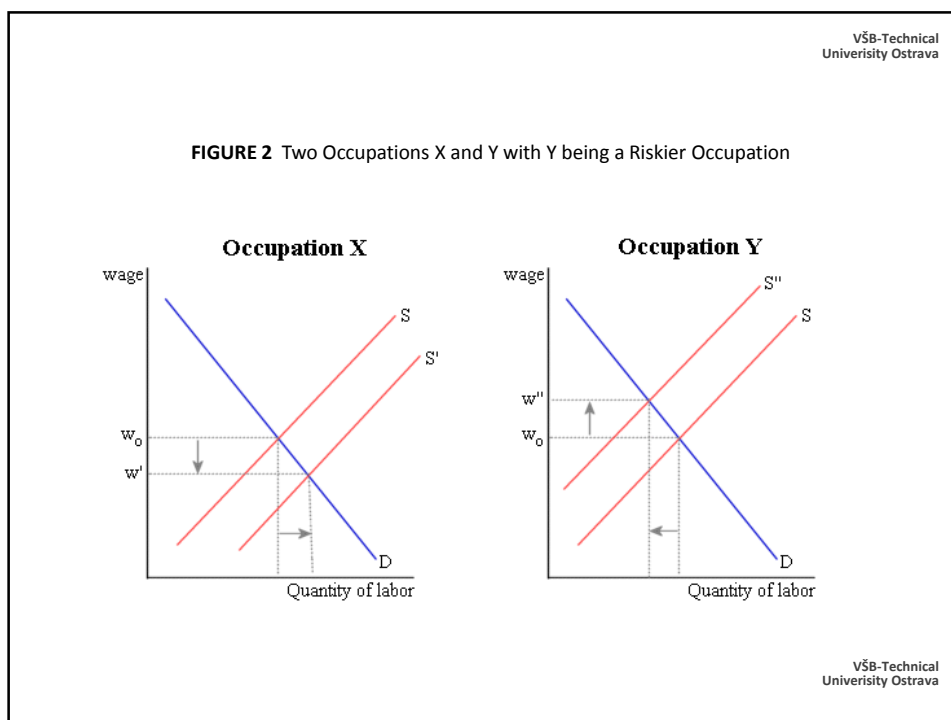
- Let's consider an example to illustrate this concept
- Suppose that two occupations (X and Y) are initially perceived as being equivalent in all attributes (e.g., educational requirements, job stress, working conditions, and other characteristics)
- In this case, it would be expected that labor supply adjustments would equate wages between these two occupation

VŠB-Technical  
University Ostrava



### Compensating wage differentials

- Suppose, though, that it is discovered that workers in occupation Y face a greater risk of suffering a fatal on-the-job injury than workers in occupation X (a perfectly safe occupation)
- This will induce some workers to migrate from occupation Y to occupation X
- Migration continues until the wage difference between the two jobs is large enough to induce workers to stay in their current occupations



VŠB-Technical  
University Ostrava

### Wage Differentials (WD)

- The wage differential  $w''-w'$  is the amount that a worker must be compensated to accept the additional risk associated with employment in the risky occupation
- This compensating wage differential can be thought of as the risk premium associated with employment in occupation Y
- Similar compensating wage differential will exist for differences in working conditions, job stress, educational requirements, and other characteristics of jobs that make them either more or less desirable
- Theory predicts that more pleasant jobs will offer lower wages than less pleasant jobs, holding all other job characteristics constant

VŠB-Technical  
University Ostrava

## Assumptions and Predictions

- Positive wage differentials will accompany bad characteristics while negative wage differentials will accompany good characteristics
- This prediction can be made only holding all other things equal
- Workers characteristics like skill level, age, experience, education, race, gender, union status, region, etc. which influence wage *have to be held constant* to obtain the above prediction

VŠB-Technical  
University Ostrava

## Assumptions and Predictions

Compensating wage differentials will reflect the market value of non-wage job characteristics if:

- workers attempt to select an occupation that maximizes their utility levels, not their income
  - Some people do not choose the highest paying job offered but the most pleasant job
  - wage do not equalize
- workers have perfect information about all job characteristics
- sufficient labor mobility exists
  - workers have a range of job offers from which to choose
  - workers are mobile

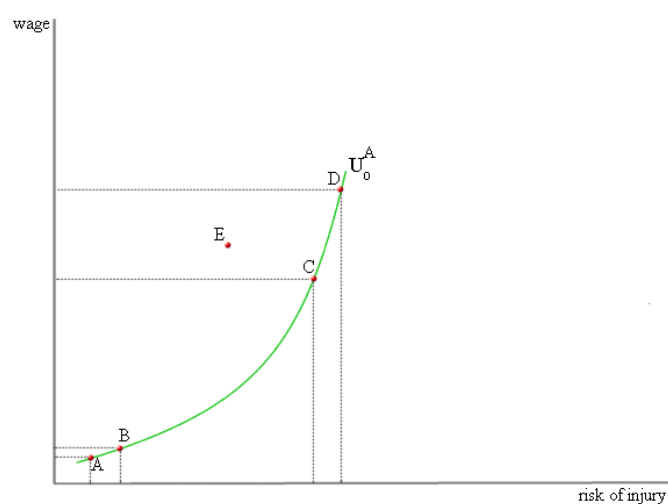
VŠB-Technical  
University Ostrava

## Employee Considerations

- Let's examine how firms and workers may jointly establish a market value for differences in the risk of injury faced on alternative job
- Employee preferences may be described by *Indifference Curves*
- Now upward sloping because risk is a bad job characteristic
- An indifference curve passes through each possible combination of wage rate and level of risk
- A higher utility is achieved on "higher" indifference curves
- Individuals with steeper indifference curves are more "risk averse" than individuals with flatter indifference curves

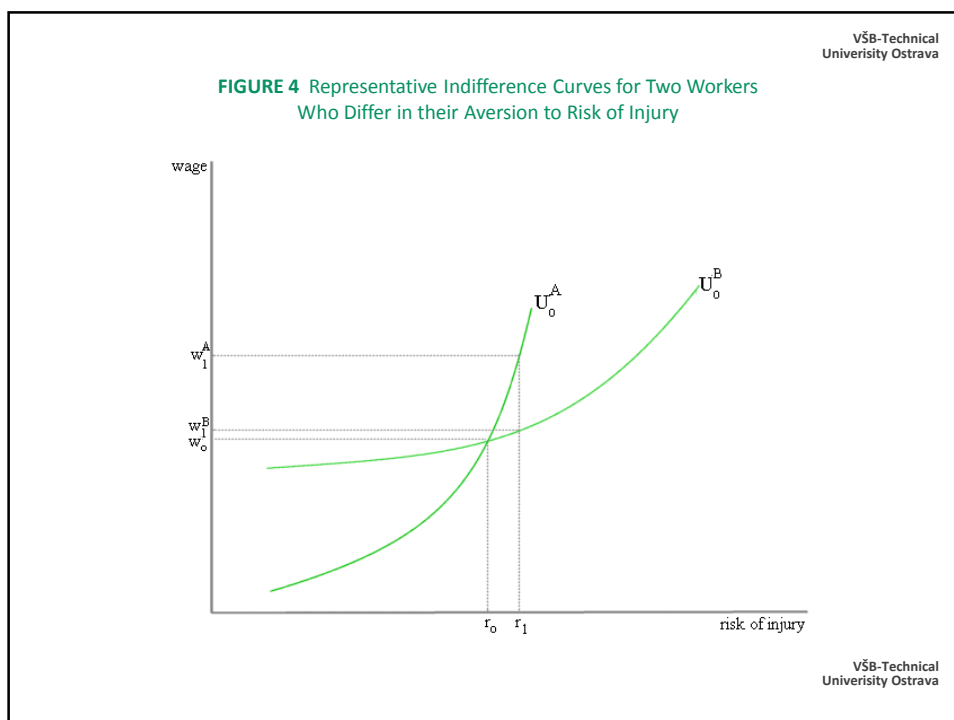
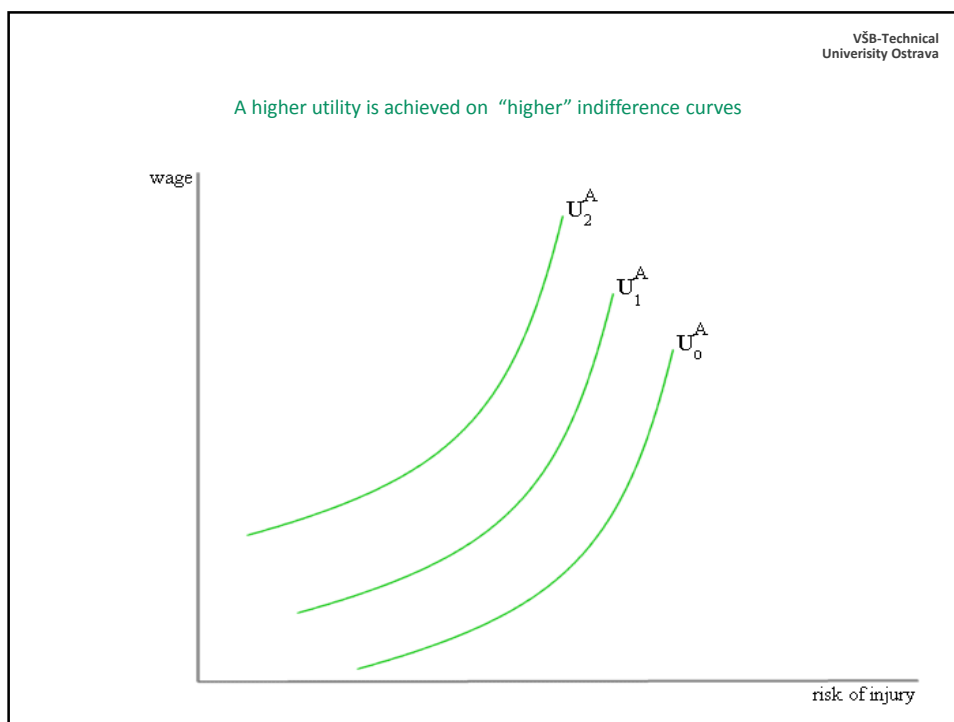
VŠB-Technical  
University Ostrava

**FIGURE 3** Indifference Curves: Wage vs. the Level of Risk of a Work-related Injury



VŠB-Technical  
University Ostrava

VŠB-Technical  
University Ostrava



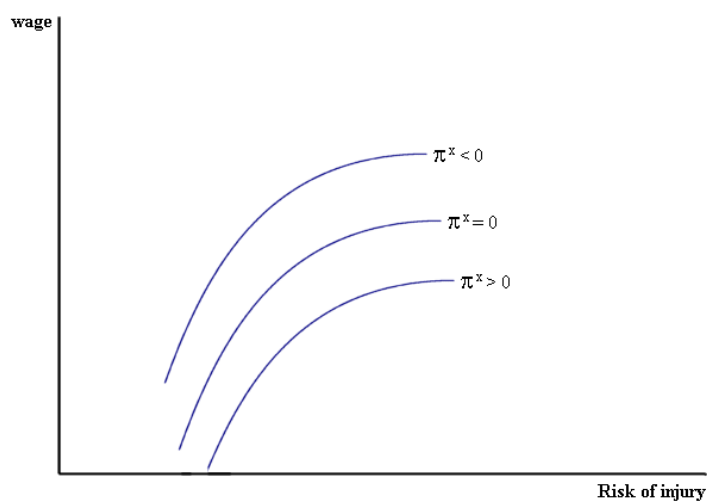


### Employer Considerations

- To understand the tradeoff between wage and risk that faces firms, useful to introduce the concept of an *isoprofit curve*
- *Isoprofit curve*: graph of all combinations of wage rates and levels of risk that result in a given level of economic profits
- An isoprofit curve slopes upward because a reduction in risk (a leftward movement along the curve) raises a firm's cost; wages must be reduced to offset the cost of risk reduction if profits are to be held constant
- Concave shape: marginal cost of reducing risk rises as the level of risk is reduced

VŠB-Technical  
University Ostrava

FIGURE 5 Isoprofit Curves for an Employer



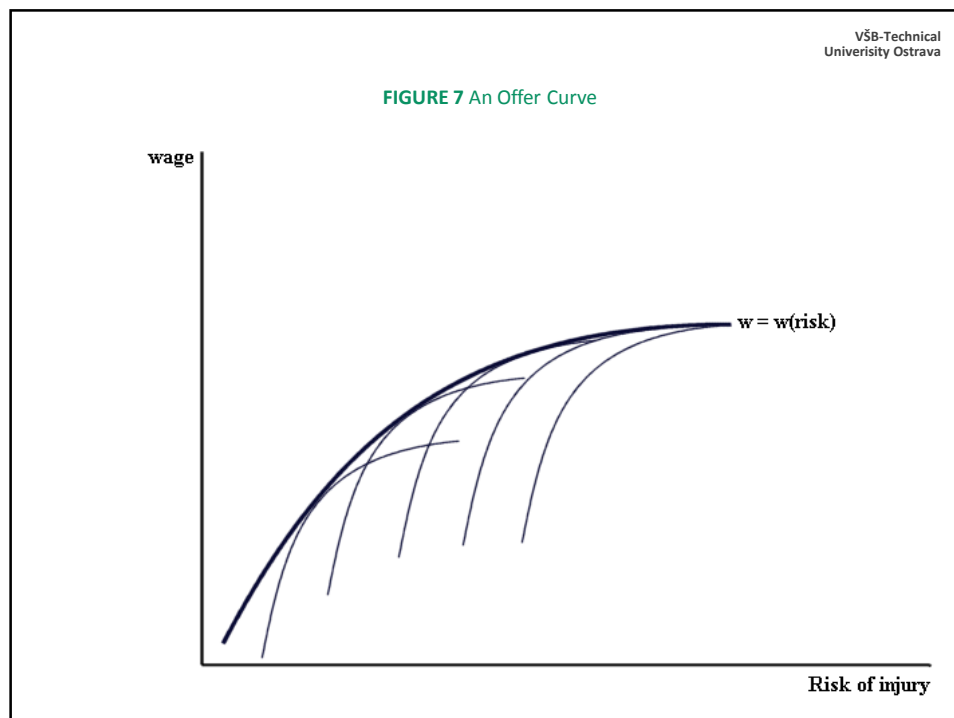
VŠB-Technical  
University Ostrava

VŠB-Technical  
University Ostrava

## The Matching of Employers and Employees

- Firm X provides higher wage for low risk levels
- At any given level of risk, workers will always select the job that offers the highest wage rate, assuming that other job characteristics are held constant
- A worker who selects a low level of risk will choose to work at Firm X while a worker who is willing to accept higher levels of risk will choose to work at Firm Y
- With a large number of firms, a wage-risk offer curve exists that serves as an envelope curve to the zero-profit isoprofit curves for all of the firms in a particular labor market
- This curve traces out the highest wage offer that workers can receive at each possible level of job risk

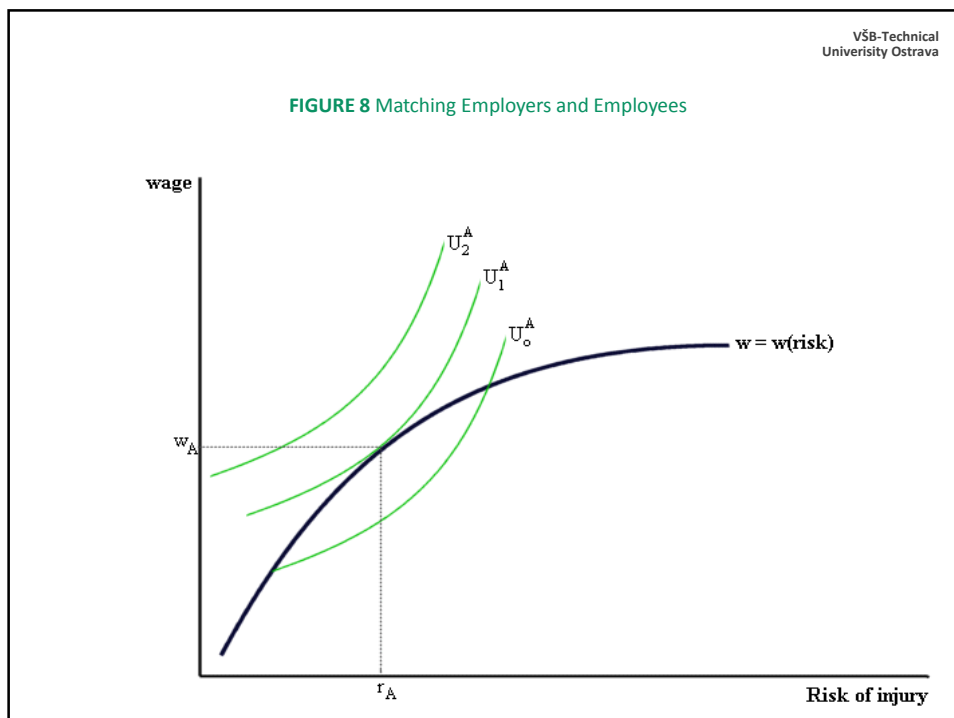
VŠB-Technical  
University Ostrava



## The Matching of Employers and Employees

- Under the assumptions of this model, workers will select the combination of wage rates and job risk that maximizes their utility levels, given the constraint that all available job offers lie on the wage-risk offer curve
- The optimal choice lies on a point of tangency between an indifference curve and the wage-risk offer curve

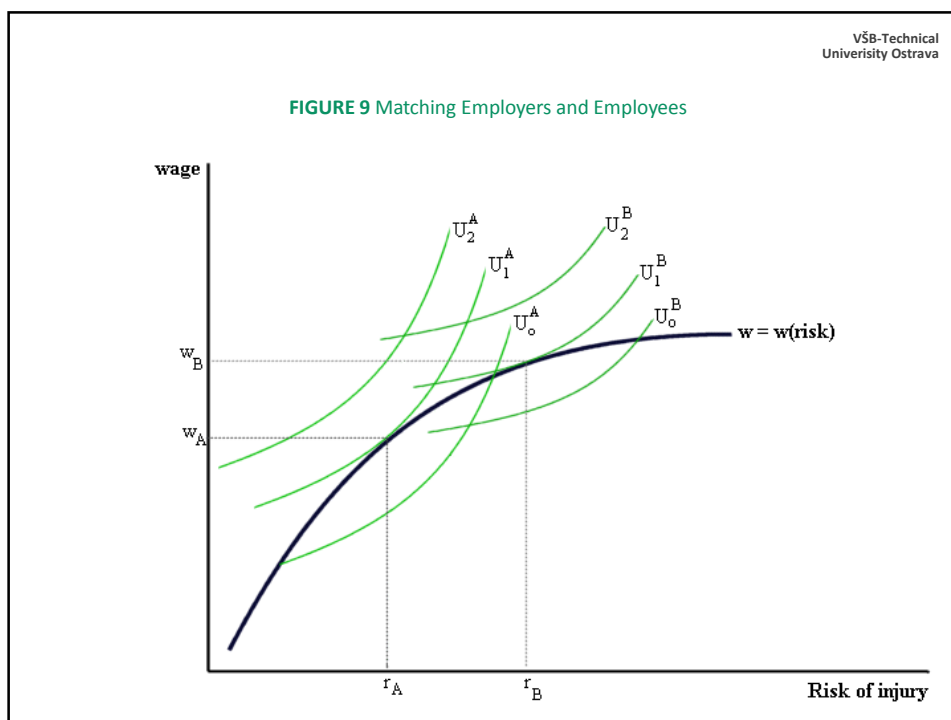
VŠB-Technical  
University Ostrava



## The Matching of Employers and Employees

- Individuals who are less risk averse will select more risky jobs that offer higher wages
- Notice also that, in this optimal sorting, the level of risk is the lowest in those firms in which the marginal cost of risk reduction is relatively low

VŠB-Technical  
University Ostrava

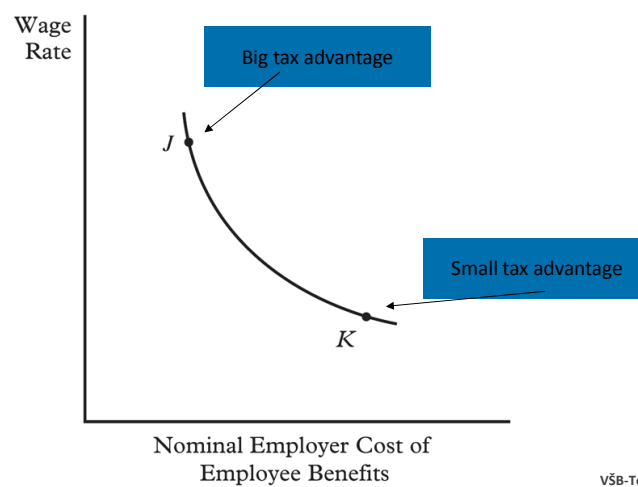


## Hedonic Wage Theory and Employee Benefits

- Employee benefits compensate workers in a form other than spendable cash
- US – 30% of income
- Payment in kind
- Deferred compensation
- Tax advantages of employee benefits vs. wage
- Preferences curves for wage vs. non monetary benefits are shaped like in the choice of work vs. leisure
- Employee and employer considerations similar as before

VŠB-Technical  
University Ostrava

FIGURE 11 An Indifference Curve between Wages and Employee Benefits

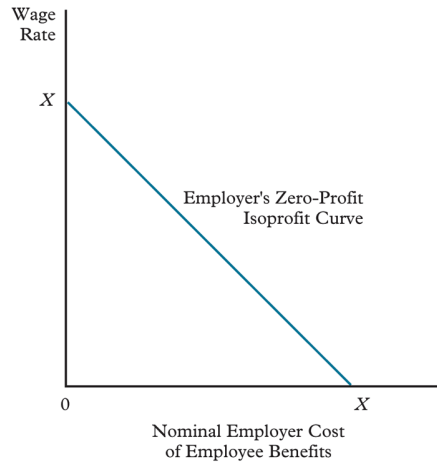


VŠB-Technical  
University Ostrava

VŠB-Technical  
University Ostrava

VŠB-Technical  
University Ostrava

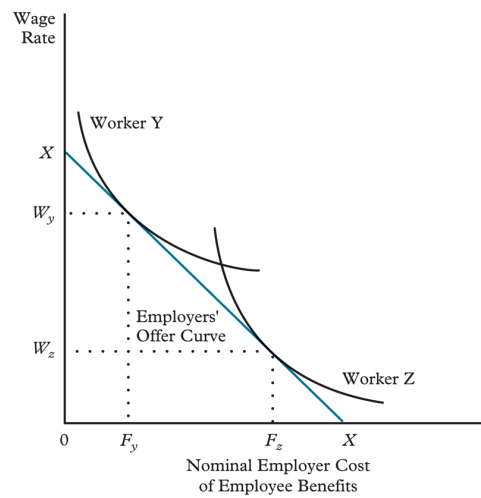
**FIGURE 12** An Isoprofit Curve Showing the Wage/Benefit Offers a Firm Might Be Willing to Make to Its Employees: A Unitary Trade-Off



VŠB-Technical  
University Ostrava

VŠB-Technical  
University Ostrava

**FIGURE 13** Market Determination of the Mix of Wages and Benefits



VŠB-Technical  
University Ostrava

**THE NEXT LECTURE: 27.1.2015**

- **10.30-12.00 Discrimination**