

Compensating Wage Differentials

Mariola Pytliková

CERGE-EI and VŠB-Technical University Ostrava,
CReAM, IZA, CCP and CELSI

Info about lectures: <http://home.cerge-ei.cz/munich/labor15/>
Office hours: by appointment

Contact:
Email: Mariola.Pytlikova@vsb.cz
Mobile: 739211312

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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/>

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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*

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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 (maximize their happiness – hedonic price)
- 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.

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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"

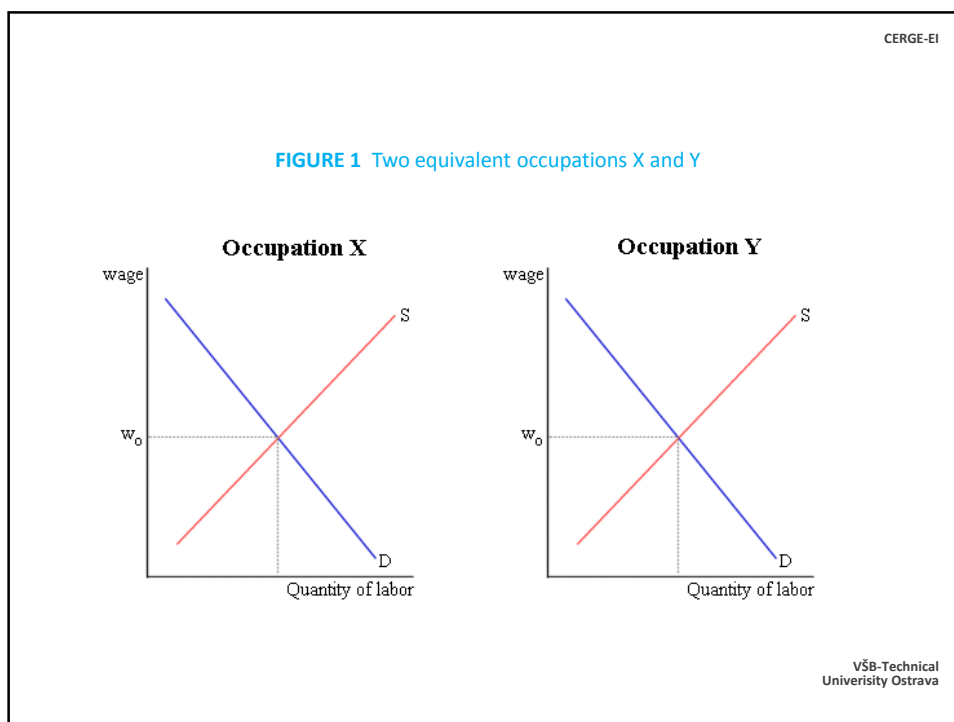
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Compensating wage differentials

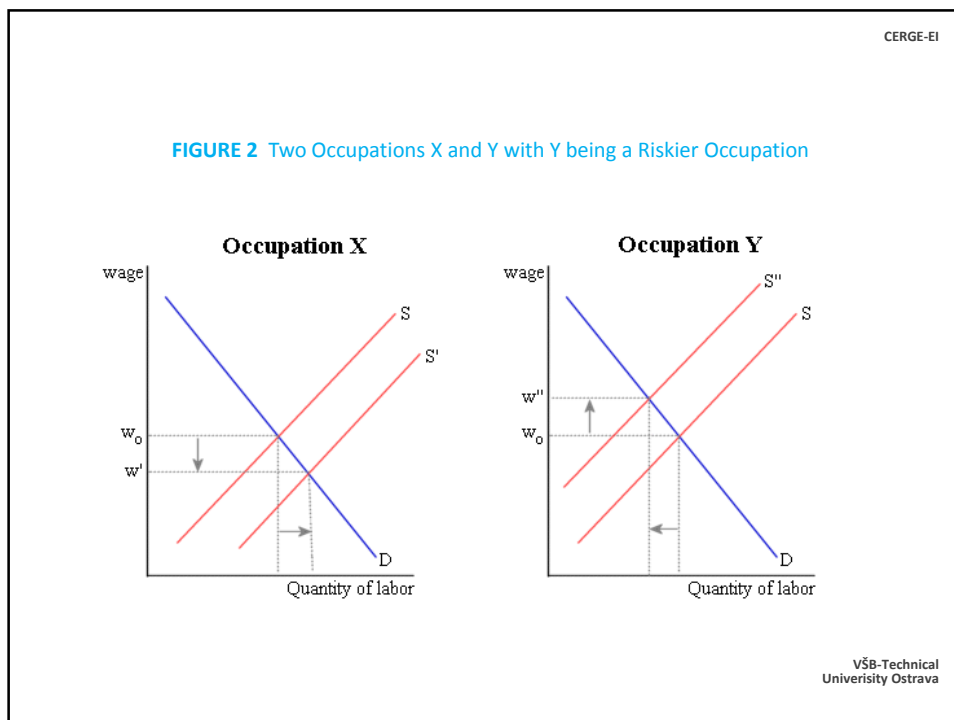
- Let's consider an example to illustrate this concept
- Suppose that two occupations (X and Y) are initially perceived as being equivalent in all attributes (e.g., educational requirements, job stress, working conditions, and other characteristics)
- In this case, it would be expected that labor supply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

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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



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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

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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

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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 (happiness=hedonic price), 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

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Hedonic Pricing Model

- Used to explain the existence and magnitude of compensating wage differentials
- Under a hedonic pricing model, a commodity is sold that possesses a set of characteristics that vary across the products that are offered in a particular market
- The bundle of characteristics that describes a particular commodity is observed by both buyers and sellers of the commodity, as is the price of each particular object
- The market price of each individual characteristic, however, is not directly observed
- In the labor market, each job can be described as consisting of a set of characteristics and an associated wage offer
- Assume that wage differentials across jobs compensate for other differences in non-wage job characteristics

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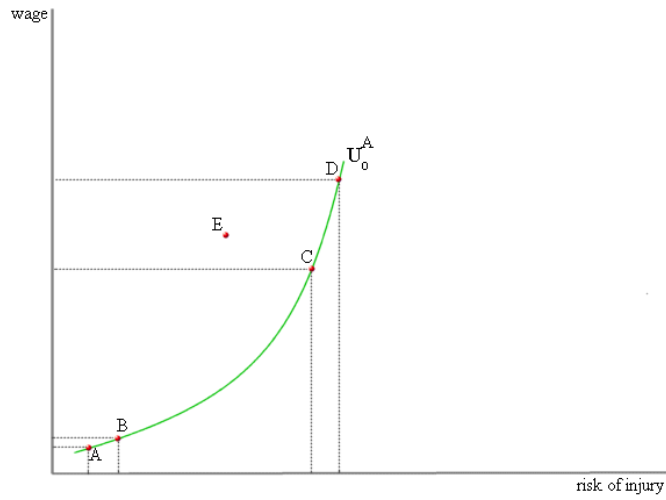
Employee Considerations

- 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

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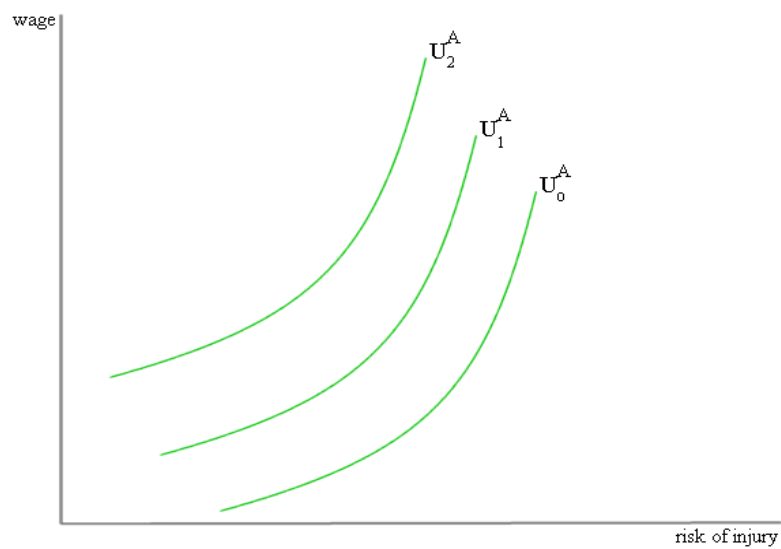
FIGURE 3 Indifference Curves: Wage vs. the Level of Risk of a Work-related Injury

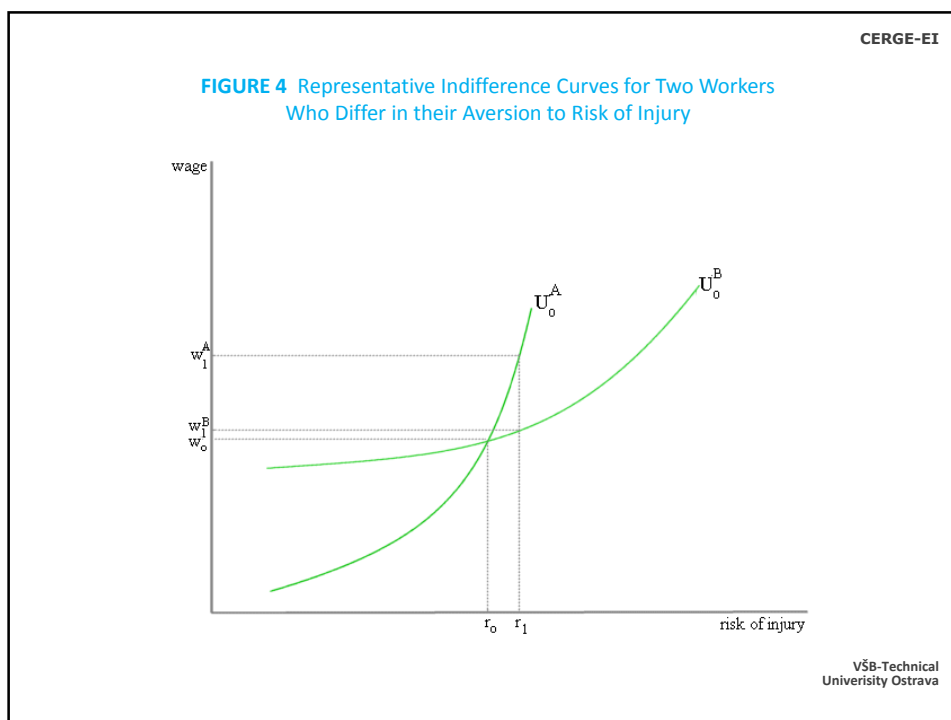


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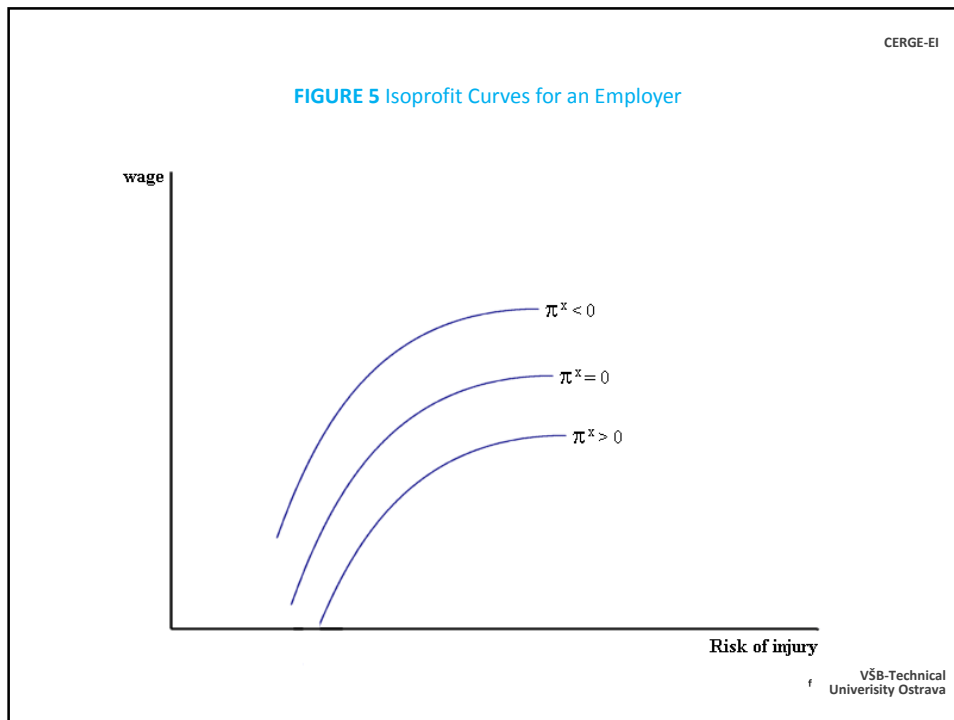
A higher utility is achieved on "higher" indifference curves





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

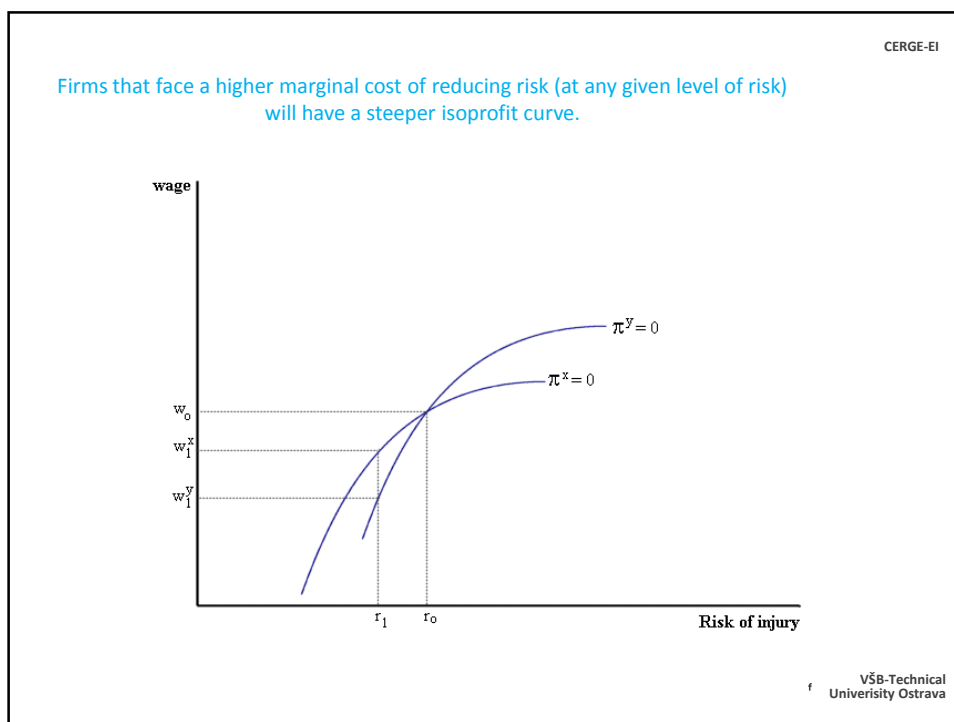


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Employer Considerations

- Economic profit, however, will equal zero in a long-run equilibrium in any market in which there are no substantial barriers to entry (perfectly competitive, monopolistically competitive, and perfectly contestable oligopoly markets)
- Long-run equilibrium tradeoff between wage rates and job risk occurs along the zero-profit isoprofit curve.
- Firms that face a higher marginal cost of reducing risk (at any given level of risk) will have a steeper isoprofit curve
- In the example below, the marginal cost of reducing risk is higher for Firm Y than for Firm X

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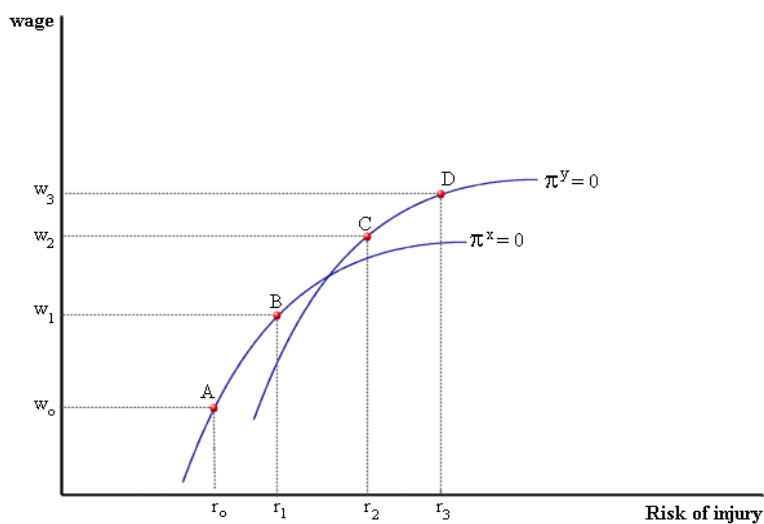


The Matching of Employers and Employees

- 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

A worker who selects a level of risk of r_0 or r_1 will choose to work at Firm X (since Firm X provides a higher wage at these levels of risk). A worker who is willing to accept higher levels of risk (such as r_2 or r_3), however, will choose to work at Firm Y.

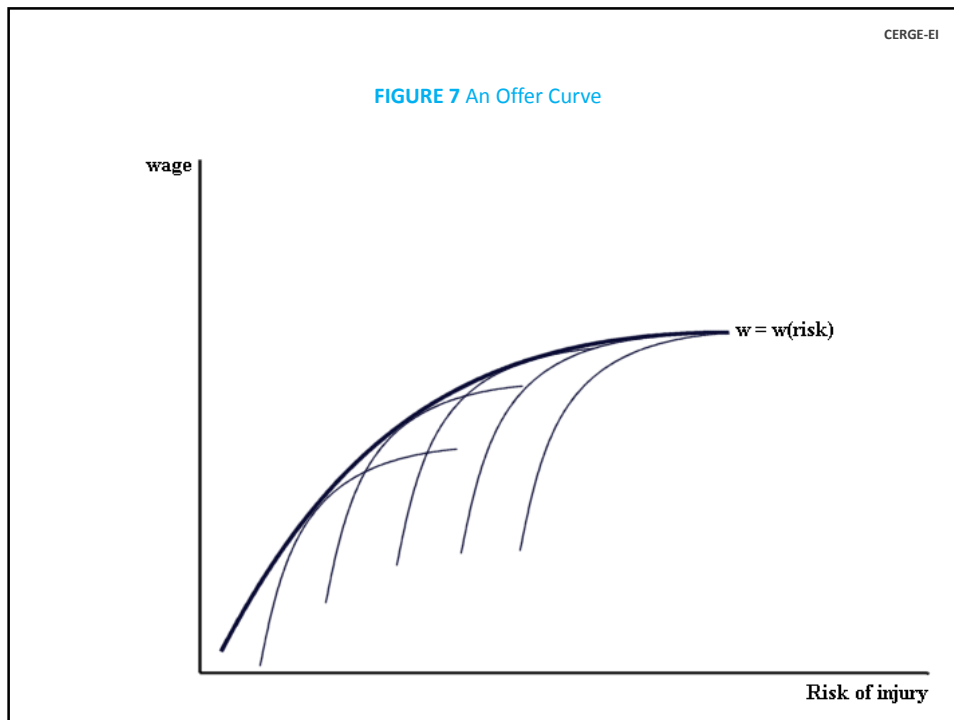
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The Matching of Employers and Employees

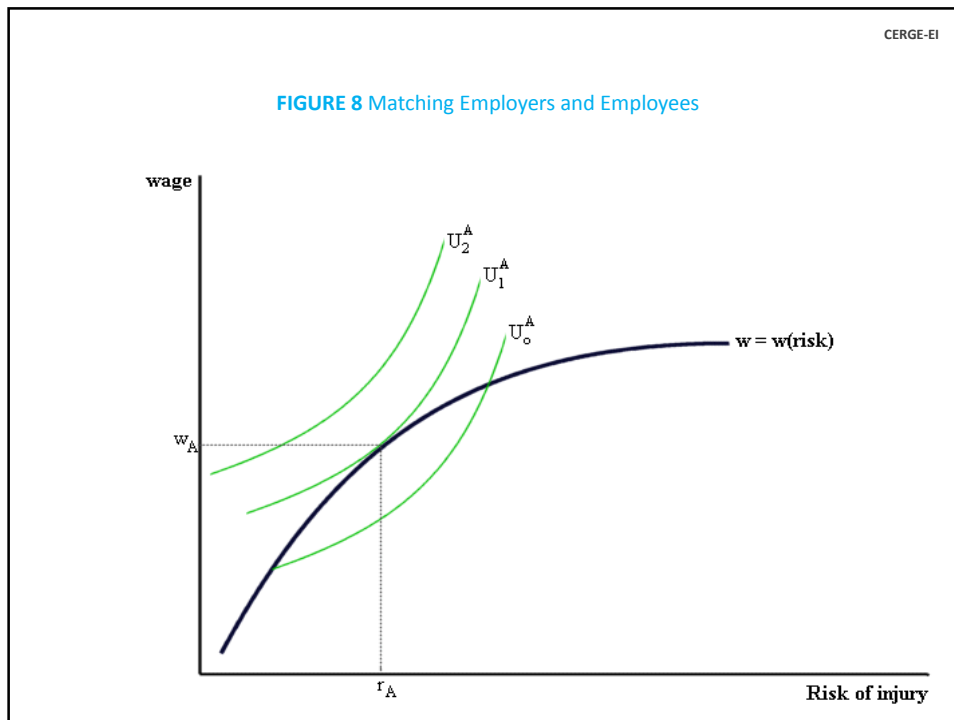
- With a large number of firms (a more realistic environment), a *wage-risk offer curve* exists that serves as an *envelope curve* to the zero-profit isoprofit curves for all of the firms in a particular labor market
- This offer curve traces out the highest wage offer that workers can receive at each possible level of job risk

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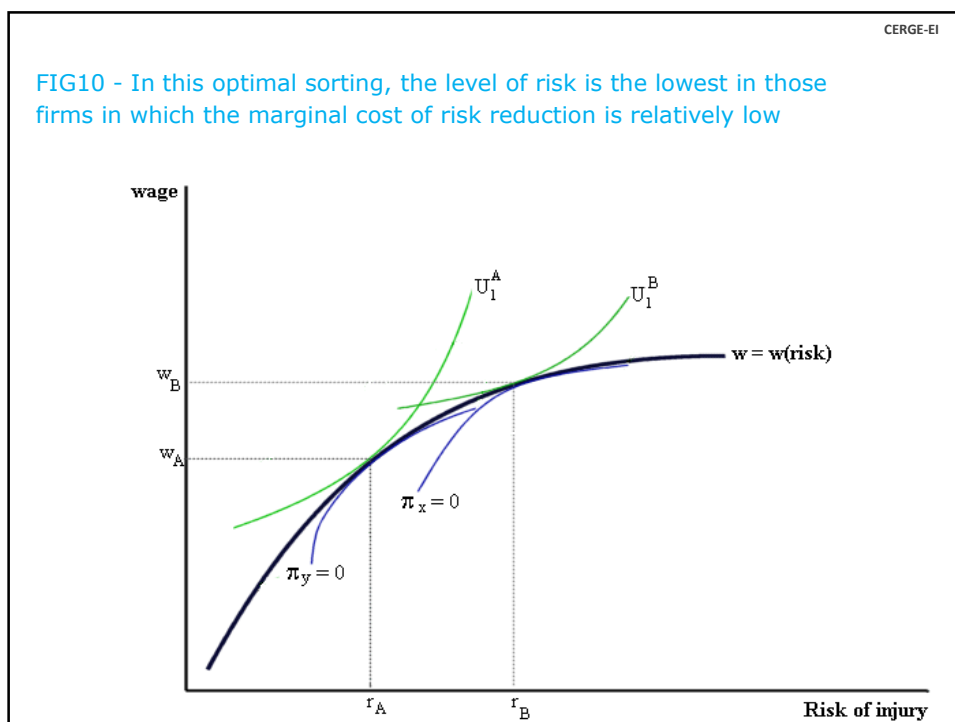
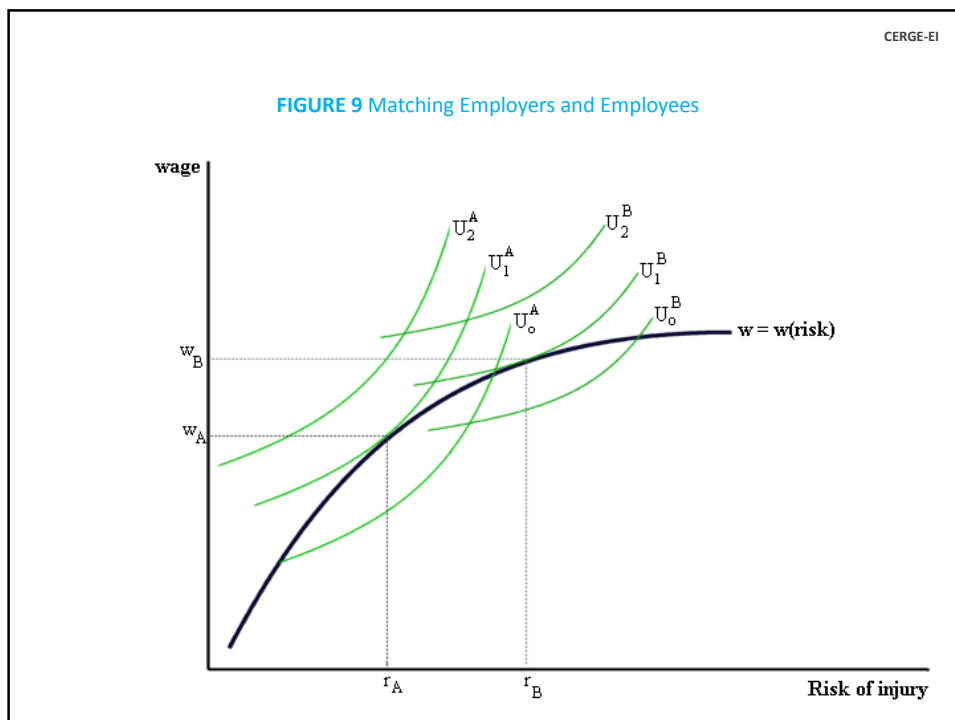
The Matching of Employers and Employees

- 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



The Matching of Employers and Employees

- Individuals who are less risk averse will select more risky jobs that offer higher wages.



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Application of Compensating Differentials

- Study by Hamermesh (QJE, 1999) on changing inequality in the market for workplace amenities
- Disamenities = adverse working conditions
- Wage inequality have increased between late 70s and mid 90s in the U.S.
- But what about changes in non monetary inequality, like disamenities?
- Uncertain if rising wage inequality has been partly offset by a negatively correlated reduction in the inequality of non monetary benefits
- Uncertain whether changing inequality of non monetary benefits has exacerbated the rise in wage inequality.

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Application of Compensating Differentials

- “Does conventional wisdom about rising wage inequality overstate or understate the true extent of the change in overall inequality in the returns to work?”
- Investigate the elasticity of supply of workers to disamenities
- Provide evidence on the changing inequality of non monetary aspects of work or on how any such changes are related to changes in earnings
- Attempt to distinguish full earnings from monetary income
- Inter industry differences in occupational injuries during 1979-95
- the study finds
 - Change in inequality between 1979-1995 was much larger than suggested by earnings comparisons, as much as 30%

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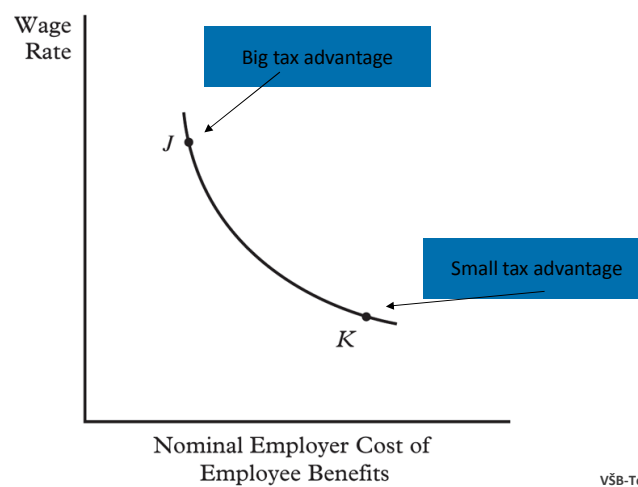
Hedonic Wage Theory and Employee Benefits

- 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

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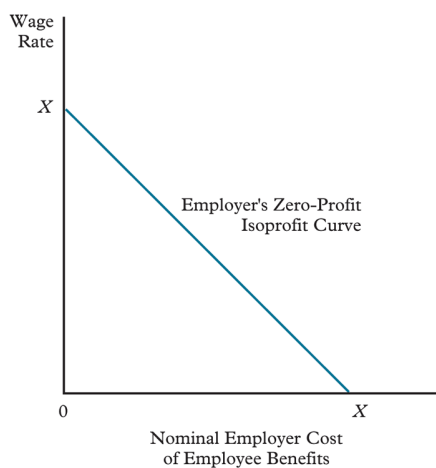
FIGURE 11 An Indifference Curve between Wages and Employee Benefits



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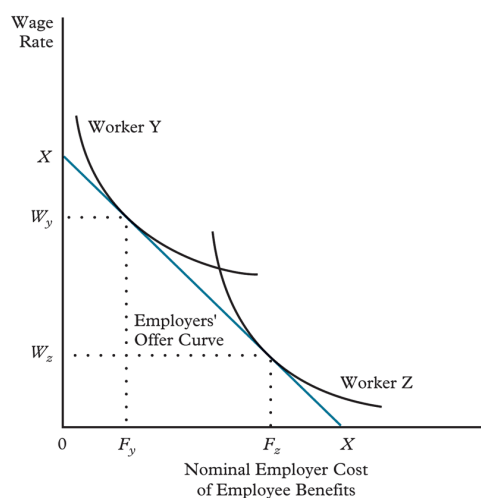
FIGURE 12 An Isoprofit Curve Showing the Wage/Benefit Offers a Firm Might Be Willing to Make to Its Employees: A Unitary Trade-Off



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FIGURE 13 Market Determination of the Mix of Wages and Benefits



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THE NEXT LECTURES: 12.10.2015

- **On discrimination:**
- Discrimination – theory and empirics;
- Discrimination – methodology – decompositions, experiments;
- Empirical evidence from the Czech rep.