Chapter 5: Compensating Wage Differentials

1. Basic idea: Wages “compensate” for non-money conditions of work, thereby “equalizing” the non-money differences

Adam Smith:
The whole of the advantages and disadvantages of different employment of labour and stock must, in the same neighbourhood, be either perfectly equal or continually tending to equality.

The five following are the principal circumstances which... make up for a small pecuniary gain in some employments, and counterbalance a great one in others:

• first, the agreeableness or disagreeableness of the employments themselves;

• secondly, the easiness and cheapness, or the difficulty and expence of learning them;

• thirdly, the constancy or inconstancy of employment in them;

• fourthly, the small or great trust which must be reposed in those who exercise them; and

• fifthly, the probability or improbability of success in them.
2. Major caveats to the “theory of compensating wage differentials”
   A. multiple things happening simultaneously (e.g., job is risky but requires little training) – so, can be very hard to tell what the net outcome will be in terms of wage diffs
   B. people have different tastes (e.g., what’s risky to one person is fun to someone else) – so, can even be hard to tell if a given characteristic will produce a positive or a negative wage diff
   C. workers may sort themselves into different jobs depending on their tastes (e.g., dull people become accountants, tough guys become cop/join military) – so, may be very hard to predict whether wage diffs will be positive or negative

3. Example: market for risky jobs
   A. Demand curve for risky jobs is downward-sloping (NB: firm will spend $ to reduce risks using cost-benefit calculus: does that reduce wage diff necessary to attract workers by enough to justify the expenditure?)
   B. reservation price: wage diff sufficient to induce someone to do the risky job – as risk of injury rises, wage diff necessary to attract workers rises determine reservation price using indifference curves: e.g., totally safe job pays $W_0$ you’re indifferent between this and a job with 100% chance of injury at wage $W_1$; “reservation wage differential” = $(W_1 - W_0)$
C. if all workers have **identical** ("homogeneous") tastes, then they’ll all have the same reservation wage, in which case...

- everyone will want to do the risky job if the wage diff is *more* than $(W_1 - W_0)$
- everyone will want to do the safe job if the wage diff is *less* than $(W_1 - W_0)$
- net result: wage diff will *equal* $(W_1 - W_0)$; everyone will be indifferent between the two jobs; and the level of employment in each job will depend only on demand

⇒ thus, *wage* is determined entirely by *supply*, and *employment* is determined entirely by *demand*!
D. if workers have different ("heterogeneous") tastes, then...
supply curve to the risky job will be *positively-sloped*,
in increasing order of risk aversion:
risk-lovers and people with little risk aversion would be willing to take risky job
for a negative or small positive wage diff;
risk-averse people would require a bigger positive wage diff)
equilibrium wage and employment here will depend on *both* supply and demand
NB: wg diff could go the “wrong way” (be negative) if enough people are risk lovers
(where “enough” means “enough, in relation to demand”)
NB: people may “sort themselves” into different jobs (risk-lovers take risky jobs,
risk-averse people take safe jobs) with no compensating wage diff at all!
4. Hedonic wage function: Generalization of the compensating differentials model

A. Supply: indifference curves for workers with heterogeneous preferences (convex indifference curves; if injury is a “bad,” higher curves entail higher utility)

B. Demand: isoprofit curves (set of points that all yield same profit for the firm)
positive-sloped: lower injury risk hurts profits, must be offset by lower wages to keep profits constant
higher curves entail lower profits: at given risk, higher wages must mean higher profit concave: at first, firm can cut risk very cheaply (so won’t need to cut wages much) while keeping profits constant – but continued reductions in risk cost much more, so require big wage cuts to keep profits constant
C. equilibrium: a hedonic wage function (in effect, a collection of supply/demand equilibrium points)

NB: shows how workers and firms match up, sort into different market segments

NB: in equilibrium, slope of isocost equals slope of indifference curve

5. Caveats on compensating wage diffs

A. beware: many things affecting wages are going on at the same time, so it can be hard to sort out what is doing what, or understand why diffs go the “wrong” way

B. e.g., “ability bias”: more-able workers get higher wages and more “good” job characteristics – so, we see a positive correlation between pay and job attributes, which seemingly disproves the theory of compensating diffs

C. ditto, heterogeneous tastes
6. Unemployment compensation and compensating wage differentials
   A. suppose layoffs are completely certain in job L, full employment in job F
   B. job L offers only $H_L$ hours of work; job F offers $H_F$ hours at wage $W_F$
   C. then job L must offer a compensating wage diff to yield the same utility as job F – determine $W_L$ by looking at $H_L$ hours of work and at the indifference curve
   D. note that all this has been worked out by the market, with no gov’t intervention – so is a government Unemployment Insurance system necessary?
7. Policy application: Safety/health regulations
   A. OSHA-type regs put a ceiling on risk of injury \( \rho \) -- so, *provided* workers are *perfectly informed* about risk-reward tradeoff, these regulations will...
   - push workers onto a lower indifference curve, reducing utility, with lower wage and lower \( \rho \) [see graph on the left]
   - push firms onto a higher isoprofit curve, reducing profits
   B. however, if workers are *unaware (or not sufficiently aware) of risks*, OSHA-type regs will get workers onto a higher utility level (but with lower \( W \)), by reducing risk [see graph on the right]
8. Policy application: Health insurance

A. Empirical puzzle: health benefits and wages *positively* correlated – is theory wrong? or could this just be “ability bias”?

B. Example: workers facing the same isoprofit (opportunity set), \( \pi_0 \), will make different choices according to their tastes, and thus will trace out the isoprofit (and thus will trace out the tradeoff between wages and benefits) …but workers with higher ability can locate on a *better* isoprofit, \( \pi^* \), giving rise to a positive correlation between wages and benefits – (seemingly, but not actually, a rejection of the theory)
C. This positive correlation between wages and benefits will show up in the data, unless we can keep “ceteris paribus” (i.e., control for ability differences)

e.g., consider a regression:
Pay = a + b Benefits + b₁X₁ + b₂X₂ + ... + bₖXₖ + e

and e = “error term” (unmeasured factors); by definition, an increase in e raises Pay. If e (= ability?) is positively correlated with Benefits, then estimate of b will be upward biased (less negative, or more positive, than the true value).

D. empirical strategy: find a valid instrument that does affect benefits package, but does not affect ability or earnings potential – thus, taste/choice variation will trace out a fixed isoprofit line

E. consider, as an instrument for the wife, whether her husband has health coverage: is this related to wife’s choice but not her earnings potential? if so, we can use it to test the theory: women whose husbands do have health insurance...
• are 15.5% less likely to have insurance of their own; and
• earn 2.6% more
• so the tradeoff is \[2.6 \%ΔW ÷ [-15.5 \% Δ insurance] = -0.168\]

F. ➔ but is husband’s coverage unrelated to wife’s earning power?