General and specific human capital

- Classic insights: Pigou 1912, Becker 1960s.
- General, firm-specific, and in-between
- Firms have an advantage in producing some types of human capital
  - Joint production of output and human capital
  - Joint production of output and information about human capital
- What is required for a labor market to be efficient?
- Common problems
  - Imperfect credit markets
  - Asymmetric information
  - Incomplete contracts

Standard labor market imperfections. Workers can neither 1) commit to LT contracts nor 2) buy their jobs

Returns to experience

The perfect spot market world of Rosen (1972).

- Jobs involve joint production of output and worker HC
- Implicit market for general HC learning opportunities
- Efficient supply and demand of job types, with implicit (hedonic) prices
- Can imply very negative starting wages at jobs with steep learning curves

On-the-job training

But firms often *do* pay for general training

- The wage compression argument
- Acemoglu & Pischke (1999): training with adverse selection $\rightarrow$ multiple equilibria
  - Training and ability are complements
  - Multiple equilibria: low/high training&mobility
  - Matching-training trade-off
- Is there adverse selection in the labor market? Gibbons & Katz: "Layoffs and Lemons" (JoLE 1991)
- Cases: Temporary help agencies, apprentice systems

Standard learning model

Observed output = unobserved type + noise
To predict output, infer type from the history of output

- Normal learning model
  - Type $m \sim N(\mu, \sigma_\mu^2)$ "initial prior"
  - Noise $\varepsilon_t \sim N(0, \sigma_\varepsilon^2)$
  - Observed output $y_t = m + \varepsilon_t$ "signal"

Observe $y_1, \ldots, y_t \to$ posterior $m_t \sim N(\alpha_t \overline{y_t} + (1 - \alpha_t)\mu, \alpha_t \sigma_\mu^2)$
where $\alpha_t = \frac{1}{t + \frac{\sigma_\varepsilon^2}{\sigma_\mu^2}}$ and $\overline{y_t} = (y_1 + \cdots + y_t)/t$

- Given μ, $\sigma_\mu/\sigma_\varepsilon$, and t, expected output updated as
  $\widehat{\mu}_t := E[y_{t+1}|y_1, \ldots, y_t] = E[y_{t+1}, \overline{y_t}] = E[y_{t+1}|y_t, \widehat{\mu}_{t-1}]$
- Other models with conjugate priors:
  Beta prior & Bernoulli output; Gamma prior & Poisson output

A Theory of Wage Dynamics
Harris & Holmström (RES 1982)

- Risk averse workers, risk neutral firms
- Firm can commit to a wage policy
- Symmetric normal learning

Time series results

- Wage increasing and concave in experience (even if output were constant!)
- Downward wage rigidity

Cross section results

- Variance increases in experience
- Skewed wage distribution

Wage dynamics inside firms

Baker, George, Michael Gibbs, and Bengt Holmstrom (QJE 1994):

- "The wage policy of a firm."
- "The internal economics of the firm: evidence from personnel data."

Inferred promotion ladder from transition matrix between job titles
Observed wage and job title histories → "BGH facts"

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Observed wage and job title histories → "BGH facts"

Gibbons & Waldman (QJE 1999) "A theory of wage and promotion dynamics inside firms"

- Ability complementary with experience → "effective ability"
- Job types within firms form a promotion ladder
- Job type complementary with effective ability

The BGH Facts (Baker-Gibbs-Holmström)

Gibbons & Waldman model explains following "BGH facts":

1. Real-wage decreases rare, demotions almost non-existent
2. Serially correlated wage increases
3. Wage growth jumps at promotion, but less than average difference between levels
4. Early wage increase predicts quick promotion

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But not:

- Cohort effects
- Nominal wage rigidity
- Negative within-level relation between initial-wage and later wage growth

Kauhanen & Napari (RLE 2012): "Career and wage dynamics: Evidence from LEED"

Some learning model insights

The quality of a worker-job match as an experience good

- Johnson (QJE 1998). "A theory of job shopping"
  - jobs vary by riskiness of match
  - optimal sequencing: try risky jobs first

- Jovanovic (JPE 1979). "Job matching and the theory of turnover"
  - optimal quitting policy for continuous time learning
  - wage increases and quitting hazard declines with tenure

On-the-job ability revelation

Terviö (RES 2009): "Superstars and Mediocrities: Market Failure in the Discovery of Talent"

- Public on-the-job revelation of talent
- Scarce jobs, abundant talent
- Standard labor market imperfections

Firms try to hire known talent $\rightarrow$ tragedy of commons of talent discovery

- Rehiring threshold too lenient
- Average talent too low
- Higher levels and higher skew in incomes

Cases: Hollywood Studio system, ODesk experiment of Pallais (AER 2014).

http://aalto-econ.fi/tervio/SuperstarsAndMediocrities_SimpleExample.pdf

Arthur C Pigou (1920): The Economics of Welfare.

Excerpt from Part IV Chapter 12.

With the poor regarded generally there is no frozen fixity of quality, but investment is capable of real effect. At a first glance we might, perhaps, expect the marginal return obtainable in this field to be equal to what it is in industry proper. This, however, is not so. In a perfectly adjusted community capital would be invested in the nurture, education and training of different persons, no matter in what class they were born, in such wise that, given the existing state of capital supply, the existing relative demand for services requiring different sorts of ability, and the existing state of industrial technique, the values of the marginal net product yielded by it would be equal everywhere. Thus, as between men with different degrees of the same kind of capacity—duke's sons and cook's sons alike—more would be invested in the abler than in the less able; and, as between men of different kinds of capacity, more would (in general) be invested in those whose kind was in keener demand.

There is, however, reason to believe that the ordinary play of economic forces tends unduly to contract investment in the persons of the normal poor, with the result that the marginal return to resources invested, not, indeed, in all, but in a great number of the poor and their children is higher than the marginal return to resources invested in machines. The ground for this belief is that poor persons are without sufficient funds to be able themselves to invest adequately in their own and their children's capacities, while they are also so situated that other persons, who have sufficient funds, are, in great measure, debarred from doing this for them. Under a slave economy, or under a social system so organised that those, in whom alien money was invested, could somehow pledge their capacities as security for loans, the case would be different. But in the actual world there is no easy way in which capitalists can ensure that any considerable part of the return on money invested by them in the capacities of the poor shall accrue to themselves. If they make a loan, they cannot exact security for repayment; if they invest directly, by providing instruction for their own employés, they have no guarantee—unless, indeed, they are manufacturers of proprietary goods requiring a more or less specialised kind of labour, which is of less value to others than to them—that these employés will not shortly quit their service; and, even when there is such security, the employers must expect that the workers, having become more competent, will endeavour to exact a wage increased proportionately to their efficiency, and so to annex for themselves the interest on the employer's investment. In fact, investment in the persons of the poor is checked in a way analogous to that in which investment in land tenanted by rich occupiers and owned by poor men may be checked. The owners cannot afford to invest, and the occupiers, living without proper security as regards tenants' improvements, and receiving, therefore, as private net product, only a portion of the social net product of their investment, are unwilling to invest as much as the interest of the national dividend requires. In view of these considerations there is strong reason to believe that, if a moderate amount of resources were transferred from the relatively rich to the relatively poor, and were invested in poor persons with a single-eyed regard to rendering the poor in general as efficient as possible, the rate of return yielded by these resources in extra product, due to increased capacity, would much exceed the normal rate of interest on capital invested in machinery and plant.