What Do We Know About Firm-Paid General Training:

The Case of Microsoft Certification

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Introduction

- Classical Theory:

  a firm will never pay for general training (Becker, 1962)

- Empirics:

  German apprenticeship

  Barron et al. (1997, 1999), Loewenstein and Spletser (1998), Bishop (1996), Cappelli (2004).

Suggested explanations:

1. **Complementarity between the general and firm-specific skills** ***(Franz an Soskice, 1995; Kessler and Lulfesmann, 2000; Brunello and Medio, 2001)***

2. **Imperfections in the labor market, i.e. wage compression** ***(Acemoglu and Pischke, 1999)***
   - **asymmetric information on training** ***(Katz and Zidermann, 1990; Chang and Wang, 1996)***
   - **asymmetric information on worker's productivity** ***(Acemoglu and Pischke, 1998; Autor, 2000)***
   - **good and workplace** ***(Booth and Zoeda, 2000)***
   - **wage regulation** ***(Loewenstein and Spletzer, 1998)***
   - **mobility, search, screening costs** ***(Clark, 2002)***

3. **Imperfections into the product market** ***(Gersbach and Schmutzler, 2001)***

Microsoft Certification

- General skills verification
- Identifiable by other employers
- Voluntarily
- Provided by a third party
- Workers choose time

Peter Cappelli “Why do employers pay for college?”, 2004

Cappelli (2004)

Firm-level data

- Ed_nh = f (T)

- Wage = f (T)
- T = f (Wr)
- Turn = f (T)

Selection story:

firms that offer tuition assistance do not recoup training cost through lower wages but attract more productive workers that also stay longer with the firm.

Data

- MCP Magazine Annual Survey
- Contacted each N^{th} person in the MCP population, response rate 20%
- Data on more than 6,000 individuals

Data

- Relatively homogeneous
- Easily identifiable skills
- Vary in level and type
- Participation is voluntarily, possible to fail
- Previous training

Descriptive statistics

Data Set	Variables	Mean	Strd. Var.
Microsoft sample	Earnings	61,126.37	24,531
	Age	35.15	8.45
	Education	15.18	1.96
	Female	0.10	0.3
CPS IT sample	Earnings	61,319.16	42,953.06
	Age	38.34	9.97
	Education	15.18	2.12
	Female	0.31	0.46

Microsoft Certification Program as of 2000

Basic	Intermediate	Advanced	
MCP	MCP + I	MCSE, MCSE+I	MCT
	MCP + SB	MCSD	
	-	MCDBA	

Certification levels

- Cert1 (basic)
- Cert2 (intermediate)
- Cert3 (advanced in one track)
- Cert4 (advanced in two tracks)
- Cert5 (advanced in three tracks)

Descriptive statistics

Certification level	N	%
Basic	412	9.16
Intermediate	50	1.11
Advanced certificate in one track	2,828	62.87
Advanced certificate in two track or MCT	991	22.03
Advanced certificates in all tracks	217	4.82
Total	4,498	100

Descriptive statistics

Who paid	N	%	Average Earnings, $
Firm	2283	50.8%	64,149
Self	1584	35.2%	59,324
Both	631	14%	60,943

The Model:

$$\begin{cases} 1)\ Cert_i = \alpha_1 + F_i\beta_1 + X_i\gamma_1 + \varepsilon_i \\ 2)\ F_i = \alpha_2 + Z_i\gamma_2 + u_i \end{cases}$$

If Cappelli's hypothesis is true Corr(e,u)>0

Dependent variables:

- F - “firm paid” variables:

  paidlsc –sponsored the full costs;
  paidlsb – firm shared the costs;

  paidlscb = paidlsc + paidlsb

Dependent variables:

- X:

  age, gender, edu, firm size

- Z:

  firm size, tenure, plans, fringe0_rel, encourgy, timetl

Estimation

$$(\varepsilon, u) \sim N(0, 0, 1, 1, \rho)$$

$$\begin{aligned}\ln L = {} & \Pr(Cert = 1, F = 1) + \Pr(Cert = 1, F = 0) \\ & + \Pr(Cert = 0, F = 1) + \Pr(Cert = 0, F = 0)\end{aligned}$$

$$\ln L = \sum \left\{ \begin{aligned} & Cert_i F_i \ln[binorm(\mu_1, \mu_2, \rho)] \\ & + (1 - Cert_i) F_i \ln[binorm(-\mu_1, \mu_2, -\rho)] \\ & + (1 - Cert_i)(1 - F_i) \ln[binorm(-\mu_1, -\mu_2, \rho)] \\ & + Cert_i (1 - F_i) \ln[binorm(\mu_1, -\mu_2, -\rho)] \end{aligned} \right\}$$

Model specification:

- All workers
- Current workers
- + did not move in 2000
- + don’t plan to move in 2001
- + 2000 & 2001

Main result:

- In all specifications, the firm's financial support has a large positive effect on the incidence of certification.
- The correlation between the unobservables from the "firm-paid" and "incidence" equations is always negative.

Workers get certified in response to the firm's offer to cover or share the costs and are not likely to get certified otherwise, everything else equal.

Wage and Firm's Assistance

1) $$W_i = \alpha + X_i\gamma + F_i\beta + \varepsilon_i$$

2) $$F_i = \alpha + Z_i\gamma + Wr_i\beta + u_i$$

where *Wr* comes from $$W_i = \alpha + X_i\gamma + Wr_i$$

Hwang et al. (1992)

Firm's assistance in the wage regression is biased due to unobserved heterogeneity

The bias depends on three factors:

- the proportion of wage dispersion due to the workers' difference in tastes;
- the degree of unobserved productivity heterogeneity;
- the average share of total remuneration taken in the form of wages.

The corrected coefficient is -0.063

Conclusions

- firm's financial support, both partial and full, has a large positive effect on the incidence of certification.

- However, the selection mechanism, if it exists, does not appear to correspond to the pattern suggested by Cappelli (2004).