

Why do Firms Train Apprentices? The Net Cost Puzzle Reconsidered

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Overview

- Motivation
- Discussion of Net Training Costs
- Empirical Approach
- Findings
- Conclusions

Motivation

- Extensive literature taking net costs during apprenticeship training as stylised fact
- Ongoing public debate about the future of the German apprenticeship system
- Validation of the net costs hypothesis using representative panel data

Literature

- Direct empirical source for net costs: series of descriptive cross section studies by BIBB
- Lower wages for own apprentices after apprenticeship training (Acemoglu & Pischke, 1998)
- Reasons: Monopsony, asymmetric information on personal traits and training contents, mobility costs (Harhoff & Kane, 1997, Acemoglu & Pischke, 1999)

Literature

- 14% of firms do never take over any apprentices (Mohrenweiser and Backes-Gellner, 2008)
- On average, proportion of apprentices does not have an impact on gross profits (Zwick, 2007)
- In Switzerland only small share of training firms have net costs (Wolter et al., 2006)

Differences between Occupations

- Apprenticeships are not homogeneous
- Manufacturing: specific skills, internal labour markets, shortage of skilled workers on the labour market
- Trade and commerce: general skills, applicable in different industries
- Crafts and construction: general skills, quick productivity, low wages

Hypotheses

1. Apprenticeships in commercial and trade occupations do not involve net costs during the apprenticeship period.
2. Apprenticeships in manufacturing occupations involve net costs
3. Apprenticeships in craft and construction occupations do not involve net costs.

Empirical Approach

- Simulate personnel managers' decision between apprentice and unskilled/semiskilled employee
- Impact of (change in) the proportion of apprentice groups on (change in) gross profits – within comparison over time
- Control for establishment and workforce characteristics

Empirical Approach

Cobb Douglas gross profit function

$$\ln \pi_{it} = \delta_1 com_{it} + \delta_2 man_{it} + \delta_3 crafts_{it} + x'_{it} \beta_i + \eta_i + u_{i,t}$$

- OLS
- Fixed Effects
- System GMM with lagged apprentice shares
- Minimum Distance Estimator on basis of System GMM

Data

- Linked employer employee data set of IAB (LIAB)
- IAB Establishment Panel
- Employment Statistics of the IAB (IABS)
- Waves 1997-2002
- Longitudinal version
- Imputations of censored wages

Impact of Training on Gross Profits

| | OLS | | FEM | | Sys GMM | |
|---|-------------|---------|-------------|---------|-------------|---------|
| | Coefficient | t-Value | Coefficient | t-Value | Coefficient | t-Value |
| <i>Share of Apprentices in:</i> | | | | | | |
| Commercial or Trade Occ. | 1.8628 | 7.61 | -0.3443 | -0.91 | 0.9683 | 2.78 |
| Manufacturing Occ. Crafts or Constructions Occ. | -0.6416 | -3.25 | -0.2180 | -0.65 | -1.2437 | -2.65 |
| | -0.6695 | -3.62 | 0.2423 | 0.68 | 1.4731 | 3.80 |
| Number of Establishments | 8169 | | 2146 | | 1879 | |
| R ² / Number of instruments | 0.1773 | | 0.0195 | | 269 | |

Impact on Profits and Productivity

| | Productivity | | Gross Profits | |
|--|--------------|---------|---------------|---------|
| | Coef. | t-Value | Coef. | t-Value |
| L1 (y) | 0.4417 | 11.27 | 0.4661 | 10.42 |
| <i>Share of Apprentice Occupation Group (Ref.: Unskilled Workers):</i> | | | | |
| Commercial and Trade | 2.5468 | 3.58 | 0.9683 | 2.78 |
| Manufacturing | -0.0277 | -0.04 | -1.2437 | -2.65 |
| Crafts and Construction | 1.3915 | 2.22 | 1.4731 | 3.80 |
| <i>Further Job Characteristics (Ref: Unskilled Workers):</i> | | | | |
| Share of Skilled Workers | 0.9723 | 5.09 | 0.2696 | 2.31 |
| Share of Part Time Workers | 1.3336 | 4.03 | 0.1687 | 0.85 |
| Log(Investment per Capita) | -0.0105 | -0.84 | 0.0065 | 0.82 |

Conclusions

- Manufacturing occupations require training investments, their benefits are in employing the apprenticeship graduates
- Shortage of skilled employees on the labour market in these occupations
- Crafts, construction and commercial occupations are cost-neutral
- These occupations do not need regulations or high take-over shares

Conclusions

- The apprenticeship system necessitates no investments in general skills in the majority of occupations
- Relative earnings of apprentices matter for profits
- We have to take lags into account in between calculations