Contribution of Apprenticeship Training to Company and Individual Success - Empirical Results and Policy Lessons from Dual-VET in Switzerland

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Pathways to Prosperity Network Institute
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Main source of research results: Leading House „Economics of Education, Firm Behavior and Training Policies“, a research center funded by SERI, in operation since 2006 (aim: evidence-based policy). Directors: Prof. Backes-Backes-Gellner, Zurich, Prof. Wolter, Berne

Leading House also provides:
❖ „Course Program for doctoral students“ in Economics of Education (capacity building for systematic research and next generation researchers)
❖ „Summer Institutes“ for Educational Reform Leaders in cooperation with CEMETS, Federal Institute of Technology Zurich
❖ next institute will be in June 2016
Characteristics of apprenticeship training in Switzerland – “Setting the Stage”

“Dual Apprenticeship Training”, “Professional and Vocational Education and Training (VPET)” (similar systems in Germany or Austria)

- typically **3 to 4 year** programs (in about 250 occupations)
- about **2/3 of a cohort** go into apprenticeship training
- teenagers (aged 15-16) **apply for an apprenticeship at a company** that has a “license” for apprenticeship training
- apprentices are “**hired** by a company for a training contract, earn **apprentice pay**, work in the company, receive **on-the-job and off-the-job training** by company (approx. 80% of their time) → **companies are key to Dual-VET**!
- apprentices attend **vocational school** (approx. 20% of their time; details depending on occupation and canton)
- both **parts** of this Dual-VET follow a well-developed and frequently up-dated **occupations-specific curriculum**
- up-to-date curricula are developed in a nation-wide **curriculum development process** (the most innovative firms are important players in that process) → **companies are key**
- **interim and final exams** are based on curricula; training quality is enforced
- **Federal-VET-Certificates** guarantee high quality skills; are **nation-wide accepted**
- **Permeability** (“kein Abschluss ohne Anschluss” → no destination without connection; no dead-end)
Return on Investment for Companies

I. During Training Period: Shortterm Net-Benefits

II. After Training Period: Longterm Benefits

1. Higher productivity due to better qualified workforce
2. Better recruitment options due to labor market reputation
3. Better innovation capabilities
1. Short-term benefits - theoretical concept and empirical results

Methodology: Cost-Benefit-Studies
(Germany and Switzerland)

Company costs:
- Wages of apprentices
- Costs of training personnel/instructors
- Costs of infrastructure, supplies, fees, administration and recruitment

What do we know about these costs → empirical research results:
- monthly apprentice pay: between 500 $ (first year) and 2’000 $ (last year)
  (→ equals e.g. 10% of wage of skilled worker (first year), 20% (fourth year)
- total costs over entire training period: ≈ 70’000 $ - 150’000 $
  • about 50% come from apprentice pay, about 40% from training personnel, about
  10-15% from training infrastructure and other costs*

Benefits = Value of apprentices’ “productive work” during the apprenticeship
- percentage of “working time” apprentices spend on productive work (“skilled/
  unskilled tasks”), and relative productivity of apprentices
e.g. percentage of working time spent on skilled tasks ranges from about 60% of time in
  firm*** (first year) to 90% (fourth year)*, relative productivity from 20% (1.yr) to 80% (4.yr)
- value of apprentices working time (gross benefits)
  → up to 153’000 CHF (160’000 $)**

* Empirical Results as summarized in Mühlemann/Wolter 2014
Results on Net-Benefits/Net-Costs: Switzerland and Germany

<table>
<thead>
<tr>
<th>Year</th>
<th>Net-benefits (until end of training period)</th>
<th>Share of firms with benefits</th>
<th>Fraction of retained appr.</th>
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</thead>
<tbody>
<tr>
<td><strong>Switzerland</strong></td>
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<tr>
<td>2000 (Schweri et al. 2003)</td>
<td>2'900 SFr (3’100 $)</td>
<td>60%</td>
<td>36%</td>
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<tr>
<td>2004 (Mühlemann et al. 2007)</td>
<td>1’700 SFr (1’800 $)</td>
<td>63%</td>
<td>37%</td>
</tr>
<tr>
<td>2009 (Struper/Wolter 2012)</td>
<td>3’200 SFr (3’500 $)</td>
<td>71%</td>
<td>35%</td>
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<tr>
<td><strong>Germany</strong></td>
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<td></td>
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<tr>
<td>2000 (Beicht et al. 2004)</td>
<td>- 6’033 € (6’800 $)</td>
<td>12%</td>
<td>53%</td>
</tr>
<tr>
<td>2007 (Schönfeld et al. 2007)</td>
<td>- 3’596 € (4’100 $)</td>
<td>30%</td>
<td>53%</td>
</tr>
</tbody>
</table>

Data based on Mühlemann/Wolter 2014: 5

- **Swiss companies on average generate net-benefit**
- More than 60% of all companies generate net-benefits → companies have no need to recoup training expenses after training → is consistent with relatively low fraction of retained apprentices
- **German companies on average generate net-costs**
- about 70% bear net-costs → firms need to recoup training expenses after training → is consistent with relatively high fraction of retained apprentices

→ obviously there are different models of how apprenticeship training generates sufficient return on investment for firms*
  → Some recoup training costs during training
  → Some rely/depend on benefits after training → long-term benefits ...

2. Long-term benefits - theoretical explanations and empirical results

→ a) Direct effect (HR) and b) indirect effect (Innovation)

a) for HR benefits two cases have to be distinguished

1. apprentices can be retained → direct effects on human resources (HR)
   • better quality/match of workers, because training period serves as effective screening device (positive selection) (*Rinawi/Backes-Gellner 2014*)
   • lower wage costs (due to higher firm attachment, transaction costs, asymmetric information)
   • savings on future recruitment costs (hiring costs often range from 2% to 5% of annual wage bill → large potential for savings) (*Mühlemann/Wolter 2014*)

2. apprentices cannot (all) be retained → indirect effects on HR
   • better external recruitment options → higher quality/quantity of applicants due to positive reputation (employer signaling) effects (lower job vacancy rates → *Backes-Gellner/Tuor 2010a*, Sadowski 1980)

→ apprenticeship training has a positive effect on company productivity due to higher quality workforce (*Mohrenweiser/Zwick 2009*)

b) Positive effects on innovation

→ in Switzerland & Germany Dual-VET is as essential for innovation as university education (*Rupietta/Backes-Gellner 2015; EFI 2014*) *

   ➢ apprenticeship training itself has positive effect on innovation of the training company (due to innovation-driving curricula, *Rupietta/Backes-Gellner 2015*)

   ➢ spillover effects: innovation is fostered by collaboration of high-skilled university graduates with high-skilled VET graduates (*Rupietta/Tuor/Backes-Gellner*),

   ➢ more flexible work organizations (*Teuber 2012*)
II. Return on Investment for Individuals

Labor market outcomes for apprenticeship graduates
- empirical results in a nutshell

1. Comparatively low unemployment rate
2. High average earnings with low risk
3. Heterogeneous returns to education → VET provides for large parts of the population higher wage premia than college education
4. Many career options and permeability
5. High returns to mixed educational paths
6. Good occupational mobility
Unemployment
• individuals starting their career with vocational education have lower risk of unemployment than individuals staying in schooling/academic track (Balestra/Backes-Gellner 2012)

Average earnings and risk
• apprenticeship training provides comparatively high average earnings with high certainty (Backes-Gellner/Tuor 2010b; Pfister/Tuor/Backes-Gellner 2015)

Heterogeneous returns to education → most important!
• returns to “academic” vs. “vocational” education is not the same for all individuals (in large parts of the ability distribution wage premia are higher for vocational education; only at the “very top of the distribution” there are higher wage premia for academic education than for vocational education) (Balestra/Backes-Gellner 2013)

Educational Career Options and Permeability
• talented individuals have many options to climb the educational ladder (tertiary B, tertiary A) (Backes-Gellner/Tuor 2010b, Hoeschler/Backes-Gellner 2014)

Labor Market Outcomes of Mixed Educational Paths
• individuals with mixed educational paths have higher returns to education (Backes-Gellner/Tuor 2010b; Backes-Gellner/Tuor/Wettstein 2010)

Occupational Mobility
• apprenticeship training offers many possibilities to change occupations in the long-run → occupational mobility is high (Rinawi/Krapf/Backes-Gellner 2014, Eggenberger/Rinawi/Backes-Gellner 2015, Geel/Mure/Backes-Gellner 2011, Geel/Backes-Gellner 2011).
III. Summary

Apprenticeship training in Switzerland and Germany pays off for companies and individuals (in different ways)

Three ingredients are essential:

1. Company commitment
   → Dual-VET is not (only) about “vocational skills”, it is about getting companies involved in ...
   • “training the next generation”
   • “guaranteeing labor market relevant skills”
   • “future oriented vocational skills”

1. Institutionalized Curriculum Development and Quality Assurance Processes
   → Systemic Approach

2. Improve “Reputation” in Society → requires joint efforts of all → Reputation is key!!
Thank you for your attention

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Center for the Economics and Management of Education and Training Systems

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Programme Directors:
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For more information, see:
The Center for the Economics and Management of Education and Training Systems (CEMETs)
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References


BACK-UP