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Economics of Education · Firm Behaviour · Training Policies

German Apprenticeship Training and the Skill Weights Approach – An Empirical Analysis

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Outline

- I. The focus of our paper
 - Mobility after Apprenticeship Training
 - Firm`s Investment in Apprenticeship Training
- II. The Skill-Weights Approach (Lazear 2004)
- III. Data
- IV. Empirical Results
- V. Conclusion

II. The Skill-Weights Approach (Lazear 2004)

- All skills are of general nature.
- These general skills are combined differently in different firms .
- A, B = General Skills A and B
- λ_i = Relative Weight of the skills A and B in firm i .
- y_i = Output at firm i .

Output of the employee at firm i : $y_i = \lambda_i A + (1 - \lambda_i) B$

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Output of the employee at firm i : $y_i = \lambda_i A + (1 - \lambda_i) B$

- Starting Point: The *employee* has to decide to what extent he acquires the skills A and B in order to maximize his income.

Output of the employee at firm i

$$y_i = \lambda_i A + (1 - \lambda_i) B$$

(with $A > B$)

“

outside (expected)

$$y_j = \bar{\lambda} A + (1 - \bar{\lambda}) B$$

Level of specificity

$$|\lambda_i - \bar{\lambda}|$$

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Level of specificity $|\lambda_i - \bar{\lambda}|$

Hypotheses

Worker Mobility

- H1** The more specific the qualification requirements of an occupation (*Ausbildungsberuf*), the lower is the probability of an occupational change after apprenticeship training.

Firm's Training Investment Share

- H2** The more specific the qualification requirements of an occupation, the larger is the investment of the firm in apprenticeship training.

III. Data

BIBB/IAB - Qualification and Career Survey 1979, 1991/92 und 1998/99

Characteristics

- Representative random samples of the German workforce.
- Detailed information about skill profiles of the employees.
- Information about the vocational carreres of the employees.
- Information about training activities of the employees.

Selection

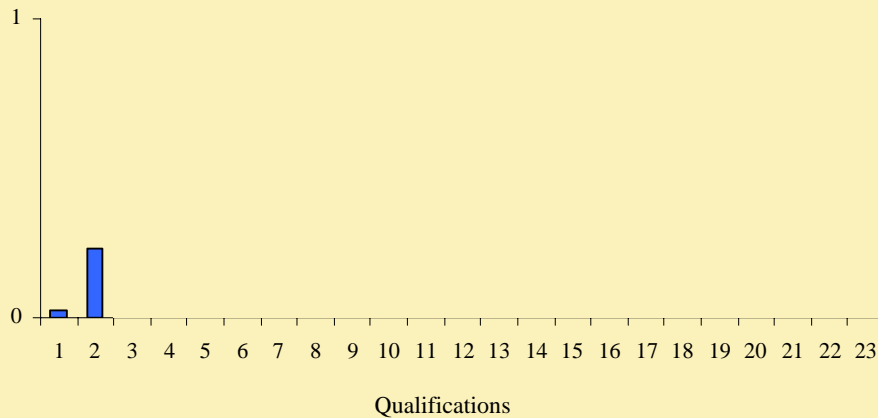
- Persons aged between 16 and 65 years
- No civil servants
- No self-employed

IV. Explanatory Variable: Specificity Degree

Qualification Portfolio of a Banker

Importance of Qualifications

Relative Frequency



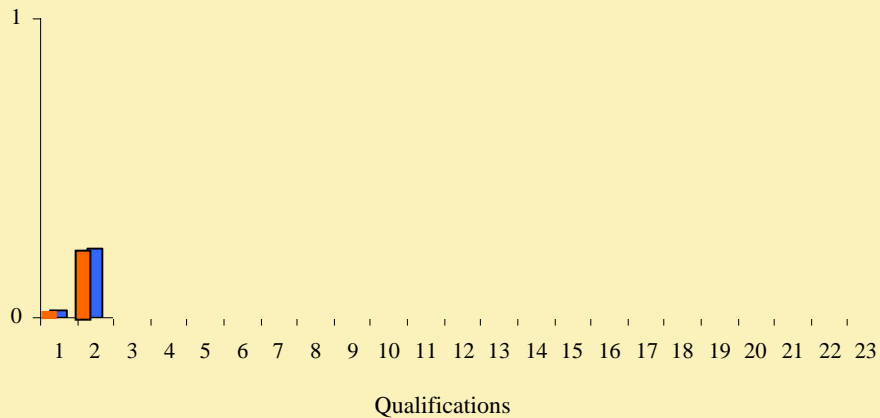
Source: BIBB/IAB-Survey 1979, own calculations.

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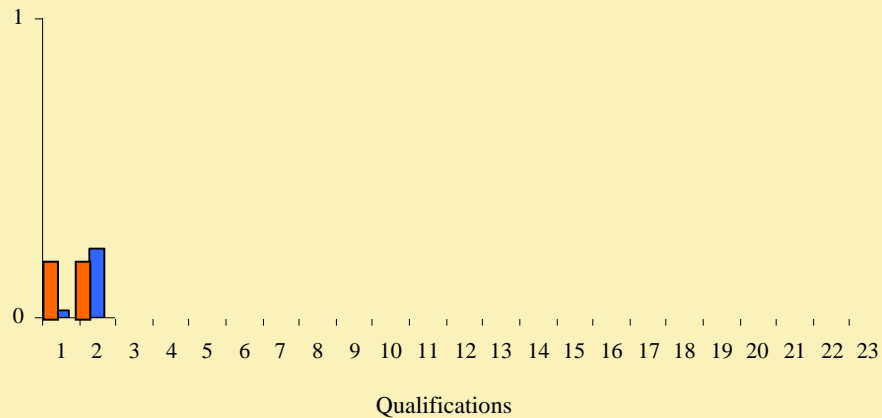
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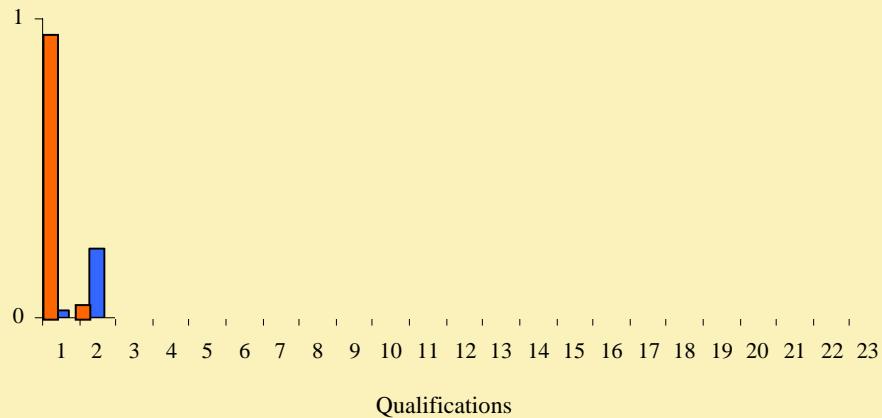
Source: BIBB/IAB-Survey 1979, own calculations.

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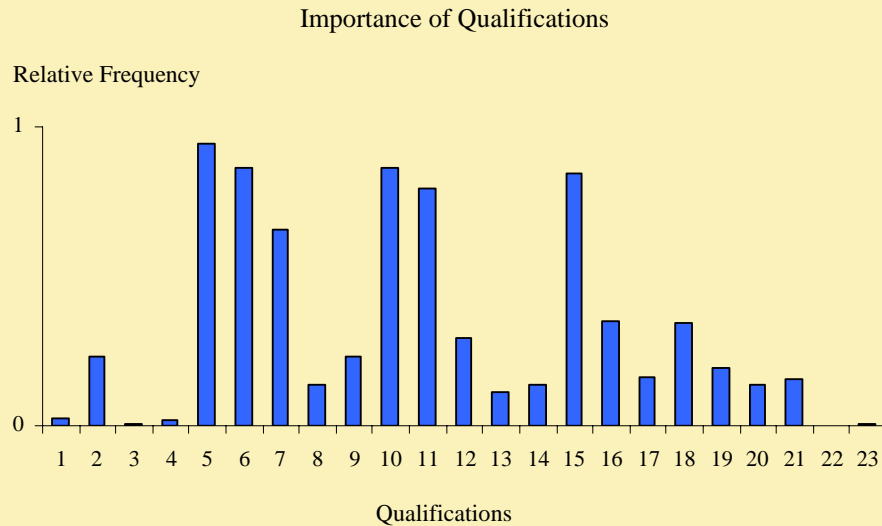
Relative Frequency



Source: BIBB/IAB-Survey 1979, own calculations.

IV. Explanatory Variable: Specificity Degree

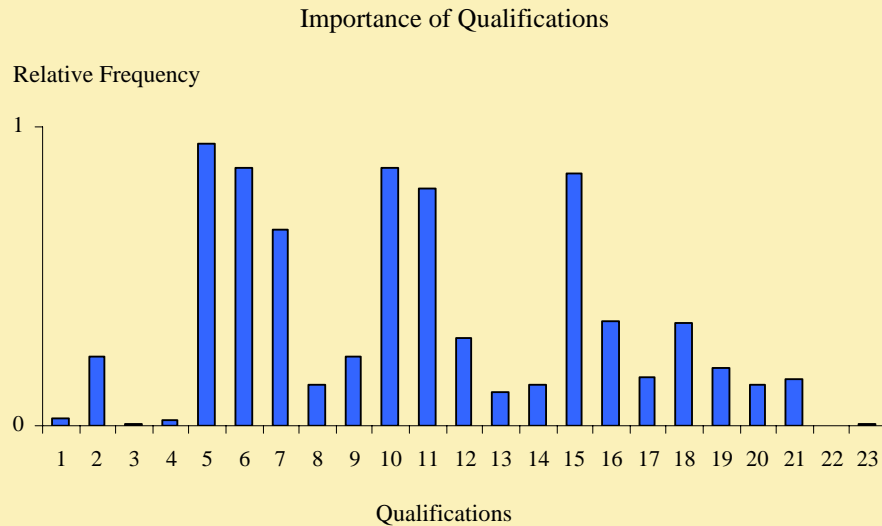
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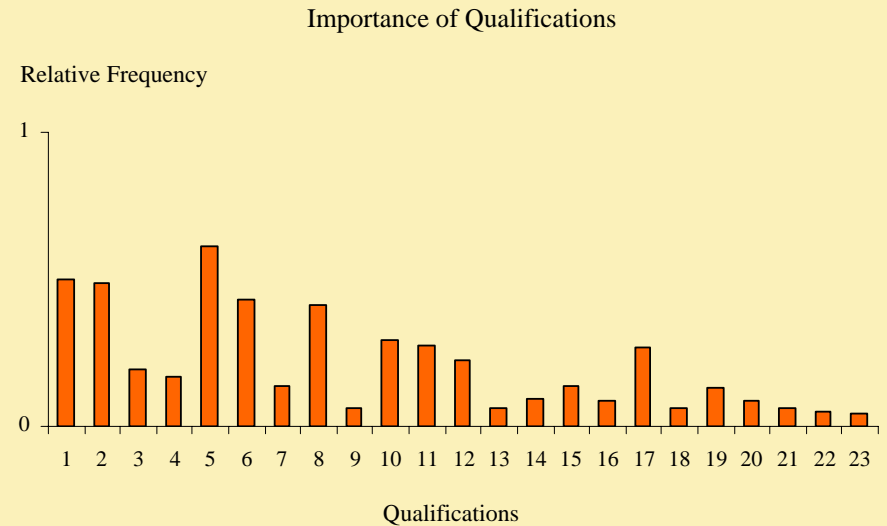
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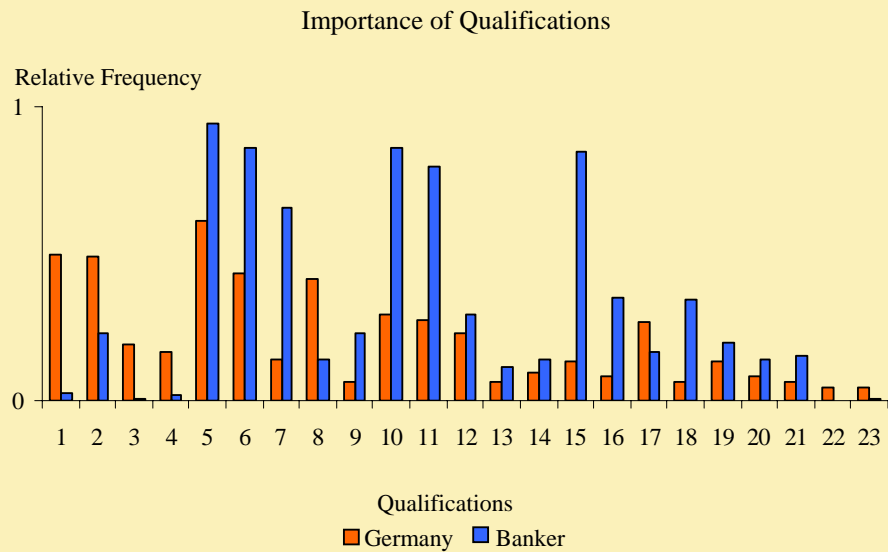


German Qualification Portfolio



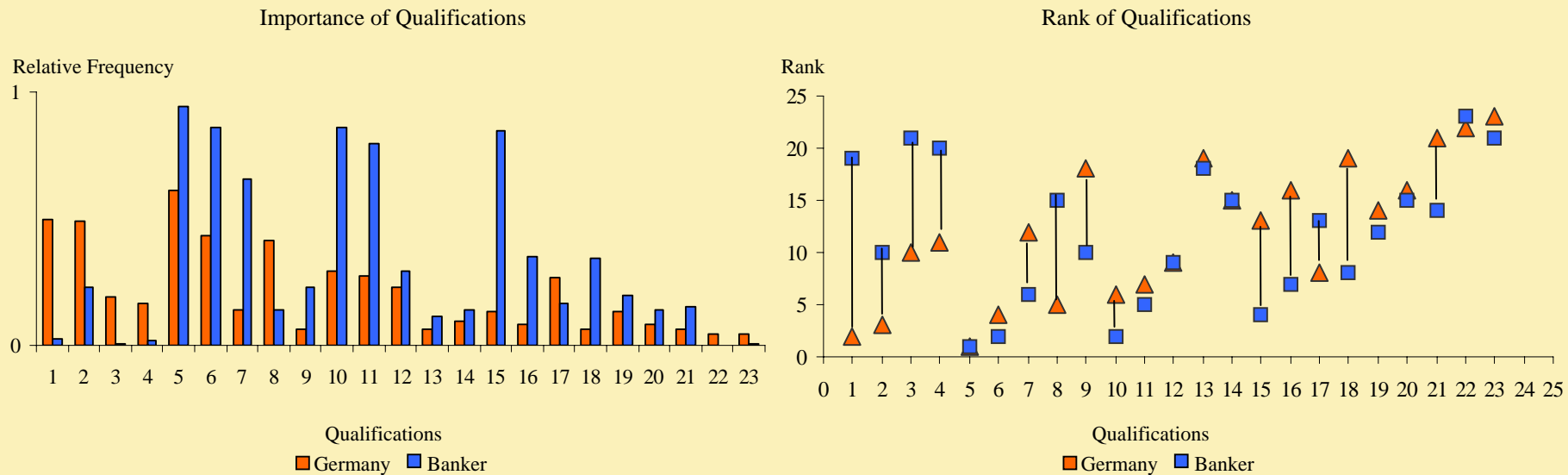
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V. Specificity of Occupation and Mobility

Determinants of Mobility (during working life)

Specificity of Occupation	-.0019132 ** (.0007577)
male	.001205 (.0069017)
age	.0395193 *** (.0019426)
age2	-.0003772 *** (.0000242)
vocational training	.0869616 *** (.0066178)
further controls	
N	25.973
Wald chi2(14)	1766.39
Prob > chi2	0.0000
Pseudo R2	0.0508
Log pseudolikelihood	-16794.486

Source: Own calculation with STATA 9.2 on the basis of the BIBB/IAB Datasets 1979, 1991/92 und 1998/99. Further controls: groesselehrbetrieb49, groesselehrbetrieb99, groesselehrbetrieb999, groesselehrbetrieb1000, gemeindegroesse100, gemeindegroesse500, gemeindegroesseueb500, welle79, welle91. Level of significance ***=1%, **=5%, *=10%. All estimates of the probit-Regression are estimated with robust standard errors in order to avoid heteroskedasty. All coefficients represent marginal effects.

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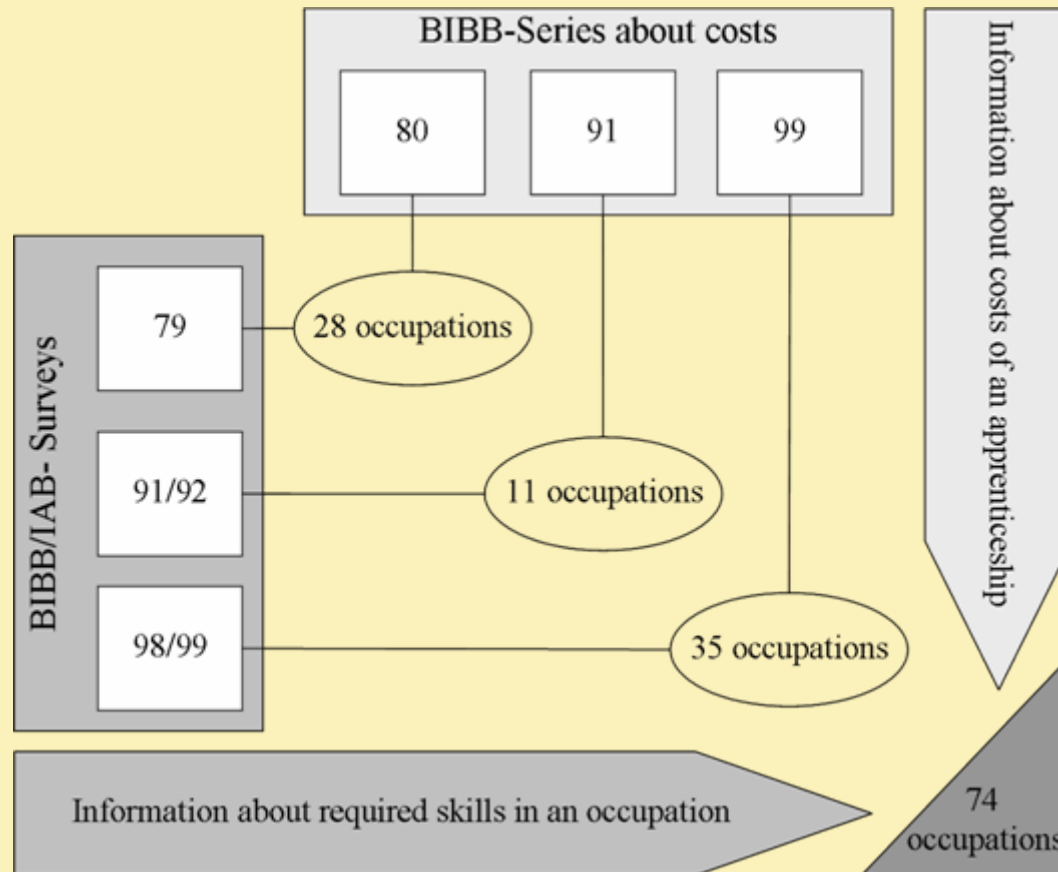
Determinants of Mobility (directly after completion of the apprenticeship training)

Specificity of Occupation	-.0007744 *** (.000267)
male	.0052922 ** (.0024538)
age	.0006948 (.0006954)
age2	-.0000152 * (8.89e-06)
vocational training	.0103447 *** (.0026047)
further controls	
N	25.973
Wald chi2(14)	681.06
Prob > chi2	0.0000
Pseudo R2	0.0717
Log pseudolikelihood	-4470.8469

Source: Own calculation with STATA 9.2 on the basis of the BIBB/IAB Datasets 1979, 1991/92 und 1998/99. Further controls: groesselehrbetrieb49, groesselehrbetrieb99, groesselehrbetrieb999, groesselehrbetrieb1000, gemeindegroesse100, gemeindegroesse500, gemeindegroesseueb500, welle79, welle91. Level of significance ***=1%, **=5%, *=10%. All estimates of the probit-Regression are estimated with robust standard errors in order to avoid heteroskedasty. All coefficients represent marginal effects.

V. Specificity of Occupation and Firm's Training Investment

Merge of Six Datasets



V. Specificity of Occupation and Firm`s Training Investment

Determinants of Firm`s Net Investment Cost

Specificity of Occupation	397.2*** (119.6)
variance in the skill portfolio	397.3 (2592.0)
age at end of apprenticeship training	1967.8*** (569.5)
Const.	-33 866.3*** (12 279.6)
Number of observations	74
F(3, 70)	5.54
Prob > F	0.00
R ²	0.19

Source: Own calculation with STATA 9.2 on the basis of the BIBB/IAB Datasets 1979, 1991/92 und 1998/99 and the BIBB-cost and benefits studies of apprenticeship training 1980, 1991 and 1998. Level of significance ***=1%, **=5%, *=10%. All estimates of the OLS-regression are estimated with robust standard errors in order to avoid heteroskedasty.

Transfer to Further Vocational Training

Transfer to Further Vocational Training

- H1`** The more unusual the qualification requirements of an employee in his current firm, the lower is the probability of a job change.

- H2`** The more unusual the qualification requirements of an employee in his current firm, the larger is the training investment share the firm has to bear.

V. Specificity and Change of Industry

Specificity of Industry	-0.0114*** (0.0041)
blue collar	0.0166 (0.0126)
age	0.0516*** (0.0075)
age2	-0.0005*** (0.0001)
exp	-0.0032 (0.0037)
exp2	0.0001 (0.0001)
male	-0.0038 (0.0129)
N	12 036
Loglikelihood	-7512.2049
	Prob> X ² ***

Source: Own calculation with STATA 9.2 on the basis of the BIBB/IAB Dataset 1998/99. Further controls: level of schooling, level of vocational qualification, income, further characteristics if the employer, further characteristics of the employee. Level of significance ***=1%, **=5%, *=10%. All estimates of the probit-Regression are estimated with robust standard errors in order to avoid heteroskedasty. All coefficients represent marginal effects.

V. Specificity and Change of Industry (Panel data from the GSOEP)

Specificity of Industry	-0.0089*** (0.0033)
blue collar	0.0134 (0.0340)
age	0.0010 (0.0180)
age2	-0.0006** (0.0003)
exp	-0.0464*** (0.0079)
exp2	0.0012*** (0.0002)
male	0.0063 (0.0341)
N	48 027
Groups	12 750
Loglikelihood	-10381.053
	Prob> X2 ***

Source: Own calculation with STATA 9.2 on the basis of the GSOEP 1996-2003. Further controls: level of schooling, level of vocational qualification, income, further characteristics if the employer, further characteristics of the employee. Level of significance ***=1%, **=5%, *=10%. All estimates of the probit-Regression are estimated with robust standard errors in order to avoid heteroskedasty. All coefficients represent marginal effects.

V. Individual Specificity and Firm's Training Investment Share

Indiv. Specificity (Industry)	1.2337*** (0.1574)	
Indiv. Specificity (Germany)		1.0843*** (0.1198)
<i>Distribution of λ</i>		
Lambda	0.0387** (0.0161)	0.0178 (0.0127)
<i>Layoff-risk</i>		
RiskWiLage	0.0544 (0.0426)	0.0567 (0.0420)
<i>Market thickness</i>		
AMDreg	-0.0114*** (0.0033)	-0.0115*** (0.0033)
AMDbr	-0.0045*** (0.0009)	-0.0076*** (0.0020)
N	13 738	13 738
Loglikelihood	-17881.24 Prob > χ^2 ***	-17864.13 Prob > χ^2 ***

Source: Own calculation with STATA 9.2 on the basis of the BIBB/IAB Dataset 1998/99. Further controls: level of schooling, level of vocational qualification, income, further characteristics if the employer, of the job, of the employee and of the labor market. Level of significance ***=1%, **=5%, *=10%.

All estimates of the ZIP-Regression are estimated with robust standard errors in order to avoid heteroskedasty. All coefficients represent marginal effects.

VI. Conclusion

1. The Skill Weights Approach widens the theoretical analysis of important questions related to vocational training.

2. The Skill-Weights Approach is very helpful to explain different empirical findings consistently:
 - The more specific an investment in human capital, the bigger is the educational investment a firm has to bear.

 - The more specific an investment in human capital, the more reduced is an employees mobility after the training.

 - These results are robust when estimating on occupational as well as on industry level.

 - The results hold on the level of initial vocational training as well as on the level of further vocational training.

VI. Conclusion

3. The apprenticeship training in Germany -formerly seen as general training- is very heterogenous in specificity: Some apprenticeships are more general whereas others are highly specific compared to the German labor market.

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VI. Conclusion

3. The apprenticeship training in Germany -formerly seen as general training- is very heterogeneous in specificity: Some apprenticeships are more general whereas others are highly specific compared to the German labor market.
4. Obviously there is a trade-off between firm`s incentive to invest and the specificity of an apprenticeship training. The higher the specificity, the higher is the firm`s incentive to invest.
 - If somebody has the idea to reduce specificity of the apprenticeship training in order to prepare the employees for technological changes, mobility might increase. But, at the same time, the firms would reduce their training investments.

Thank you for your attention!

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