Freie Universität Berlin

Venice-Seminar
San Servolo, 12.11.2018

Consequences of University Dropout for Getting an Apprenticeship in Germany. A Factorial Survey Experiment

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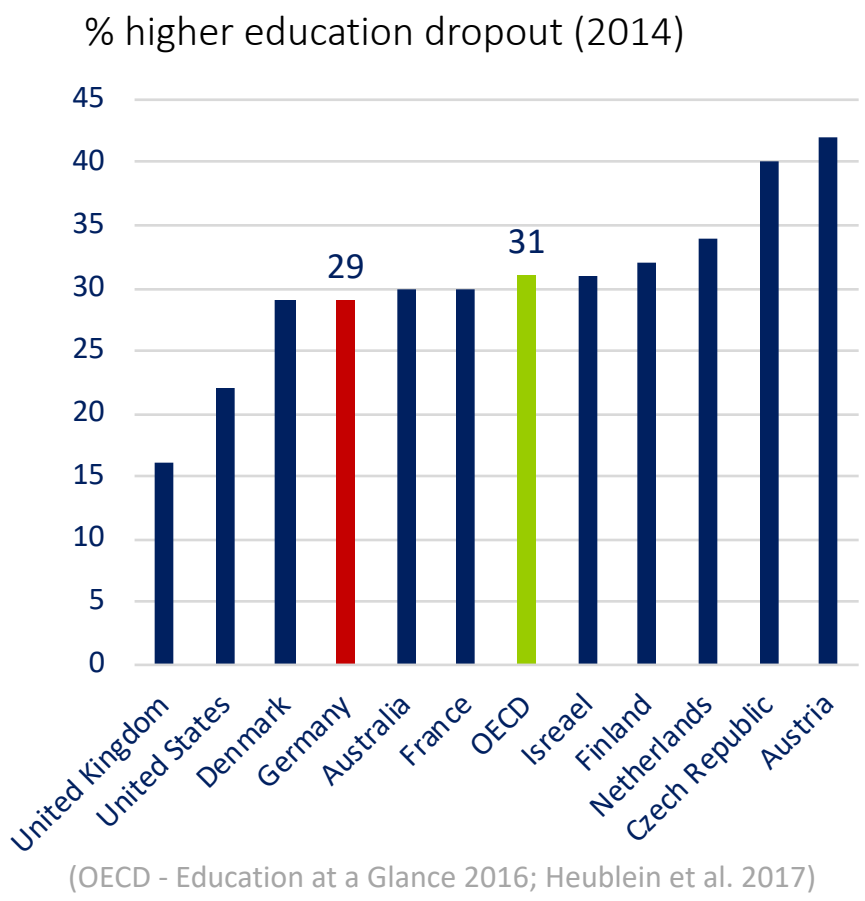
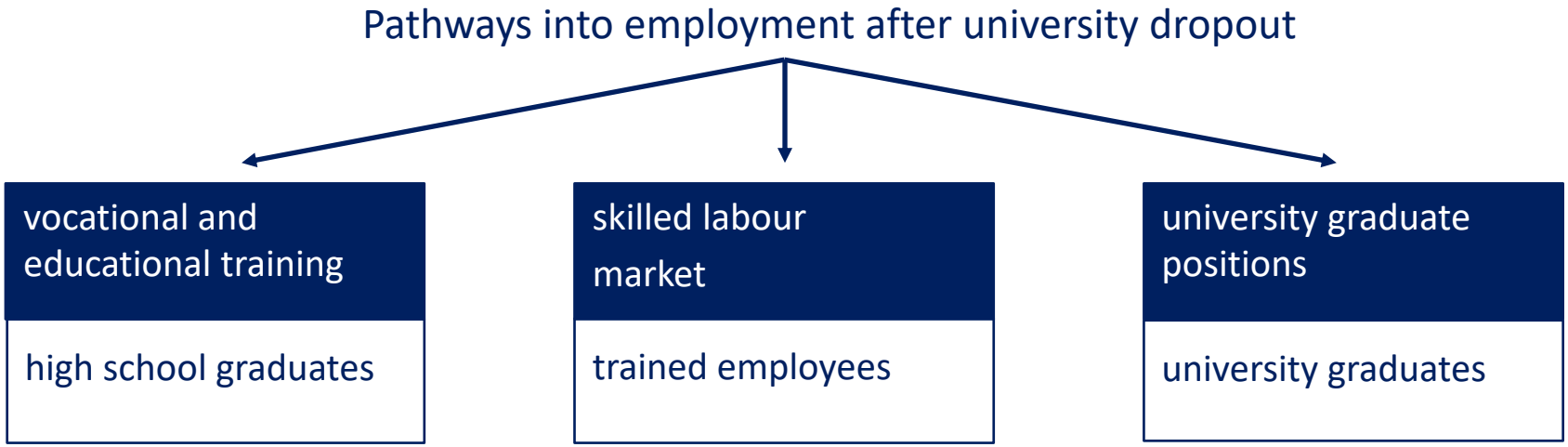
Motivation



(OECD - Education at a Glance 2016; Heublein et al. 2017)

- Plenty of research on causes for dropout (e.g. Danish Clearinghouse 2014; Tinto 1975) – but little on (labor market) consequences
- Available evidence is based on surveys with former students (e.g. Schnepf 2017; Matkovic & Kogan 2012; Heublein et al. 2017)
  - Inadequate control of confounders (e.g. cognitive or motivational characteristics)
  - Disregards employers perspective (ignorance of the demand side of hiring)
  - No comparison with typical competitors

Motivation

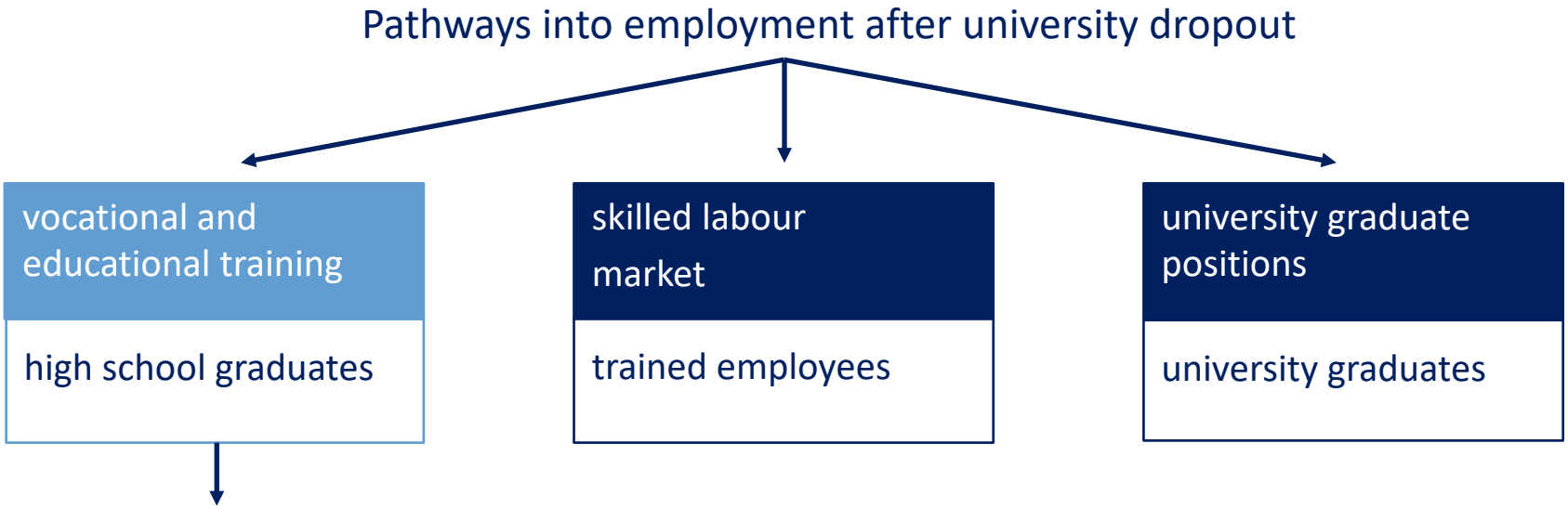


Contribution

Experimental studies with employers to...

- identify causal effect of a dropout on employment prospects in the three labor markets
- Understand mechanisms behind employers‘ evaluations
- Identity factors which can improve dropouts‘ employment prospects

Focus today: Apprenticeship



43% of dropouts begin apprenticeship (Heublein et al. 2017)

Research Questions

1. What is the causal effect of dropout on employment chances in the German apprenticeship market?
2. Which factors facilitate labour market entry for university dropouts?

Theory

The demand side of hiring

- Employers as rational decision-makers who *screen* applicants to identify applicants with *low training costs* (e.g. skills, willingness to learn, motivation, perseverance) (Stiglitz 1975; Thurow 1979, Bills et al. 2017)
- Hiring decision uncertain: training costs must be inferred from applicants signals
- Applicants education is a signal (among others) for trainability, because it signals brains and 'willingness to learn', or it is skill-enhancing, or both.

University dropouts vs. high school graduates competing for an apprenticeship

- Dropouts have same degrees, but may signal more experience, skills = lower training costs

H1: Dropouts are expected to have at least the same or higher chances to get an apprenticeship offer.

Theory

University dropouts vs. high school graduates competing for an apprenticeship

- Employers evaluation depends on characteristics of dropouts
  - a better *GPA in university* reflects higher cognitive skills
  - a *job-related field of study* (instead of an unrelated field) indicates affinity towards the apprenticeship and/or occupation-specific skills
  - the same is true for a *job-relevant internship*
  - late-vs-early dropout unclear (late = more skills? late = time-waste?)

H2: A better GPA, a job-relevant field of study as well as an internship increase the chances to get an apprenticeship offer.

- …and on characteristics of the occupational field
  - *Transferability of skills*: According to Heublein et al. (2018), skills learned during computer science studies are more applicable to jobs in IT than skills learned during business studies are to commercial jobs (Kaufmännische Berufe)

H3: Dropouts in computer science have better chances in IT jobs than dropouts from business studies have in commercial jobs.

Methods

Sample and data collection

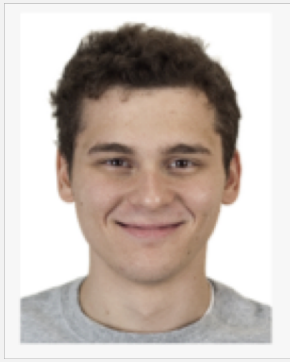
- Focus on two occupational fields IT (Fachinformatiker) and commercial (Bankkaufleute, Immobilienkaufleute, Kaufleute für Versicherungen)
- Web scraping of all apprenticeship positions advertised 09/17 – 02/18 on the major online job market for apprenticeships
- Random sample of n = 4000 employers
- Web survey with n = 561 employers (response rate = 14 %), M = 9.7 years of experience, 93.8% are responsible for selection of candidates

- *Asked to simulate a candidate selection*
- *Primed with a matching job offer they rated 8 hypothetical candidates*

Methods

Factorial design – exemplary CV

Name
Jakob Roth



Education & Qualification
Abitur GPA 1.8

Last grade in German	12 points (2+)
Last grade in mathematics	12 points (2+)

Working experiences
Three-months internship for 3 month in a well-known IT-company

Interests
Swimming

Other
dropped out of computer science studies in the 2nd semester, with an academic performance of 3.3

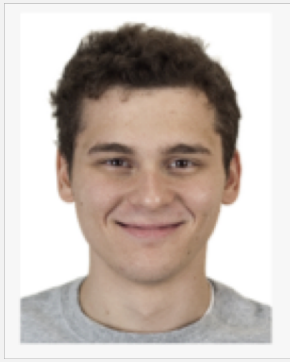
How likely is it that you would invite Mr. Roth for a job interview?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%

Methods

Factorial design – exemplary CV

Name
Jakob Roth



Education & Qualification
Abitur GPA 1.8
2.7
Last grade in German 12 points (2+) 3-
Last grade in mathematics 12 points (2+) 3-

Working experiences
Three-months internship for 3 month in a well-known IT-company vs. no internship

Interests
Swimming

Other
dropped out of Law studies computer science studies in the 6th 2nd semester, with an academic performance of 1.7 3.3

How likely is it that you would invite Mr. Roth for a job interview?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
○	○	○	○	○	○	○	○	○	○	○

Methods

Factorial design and data analysis

- 561 employers * 8 vignettes = **4488 ratings**

  + survey on characteristics of employers (e.g. experience) and company (e.g. size)

- From all possible 2^{10} vignettes (excl. illogical cases), we sampled a deliberated fraction of N = 128 different vignettes, ensuring a high statistical efficiency
- The 128 vignettes were divided into 16 decks with 8 vignettes each (4 dropouts, 4 high school graduates)
- Missing data (1.8% to 5.0%) were multiple imputed (m=5)
- Random intercept models with vignettes nested in employers

Results

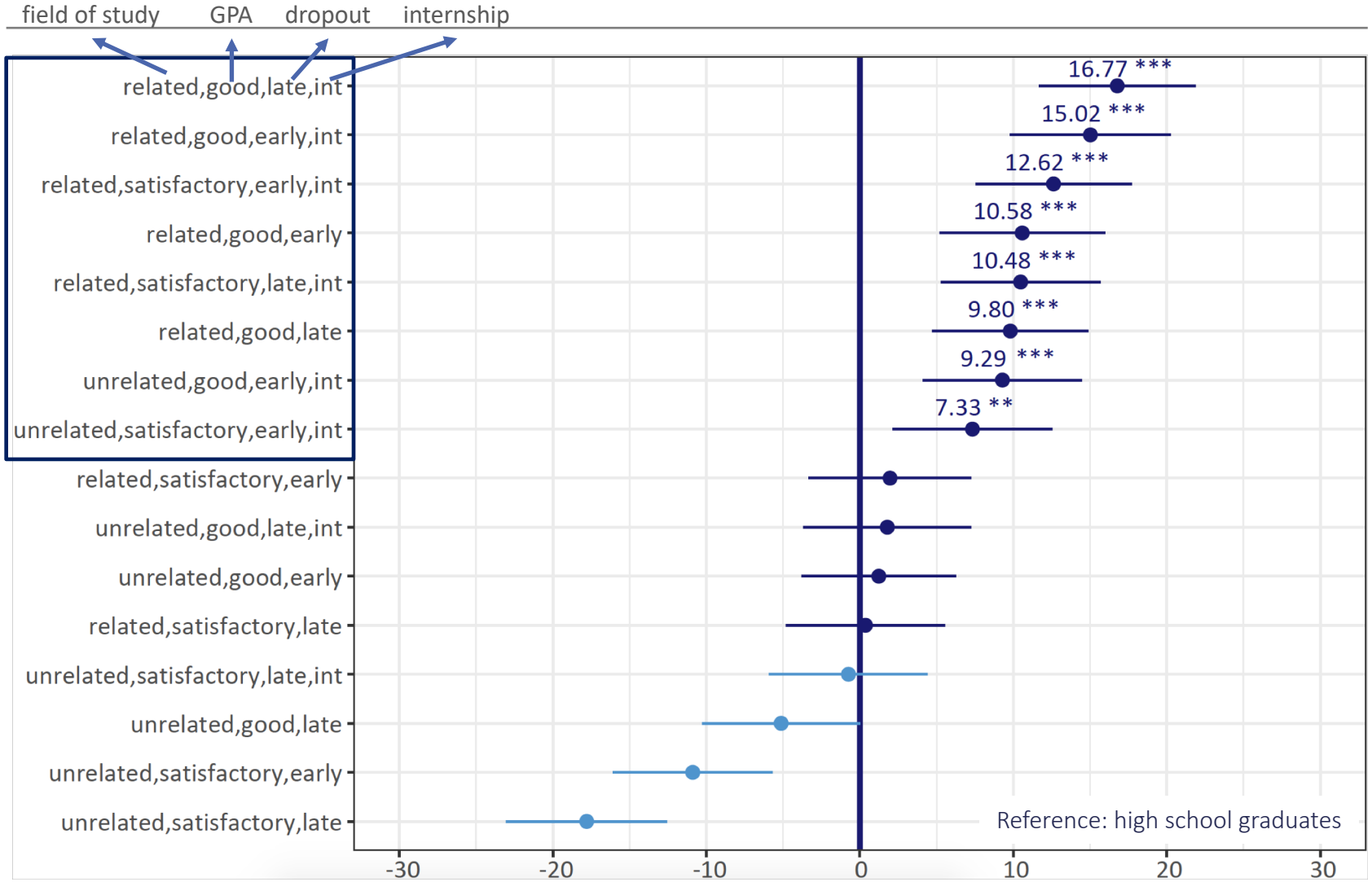
1. Causal effect of dropout on invitation probability

	coeff		*se*
dropout	3.80	***	0.88
Constant	115.30	***	12.21
N employers / vignettes			561/ 4488
Log likelihood			–1670.99
Std Dev employers / vignettes			24.84/ 36.49
rho			.32

Note. Invitation probability as dependent variable was log-transformed and coefficients can be interpreted as approximate changes in the percentage points of employers' ratings with a unit change of the independent variable. The model controls for further vignette dimensions, employers' characteristics, set and order effects.

Results

2. Factors influencing invitation probability



Results

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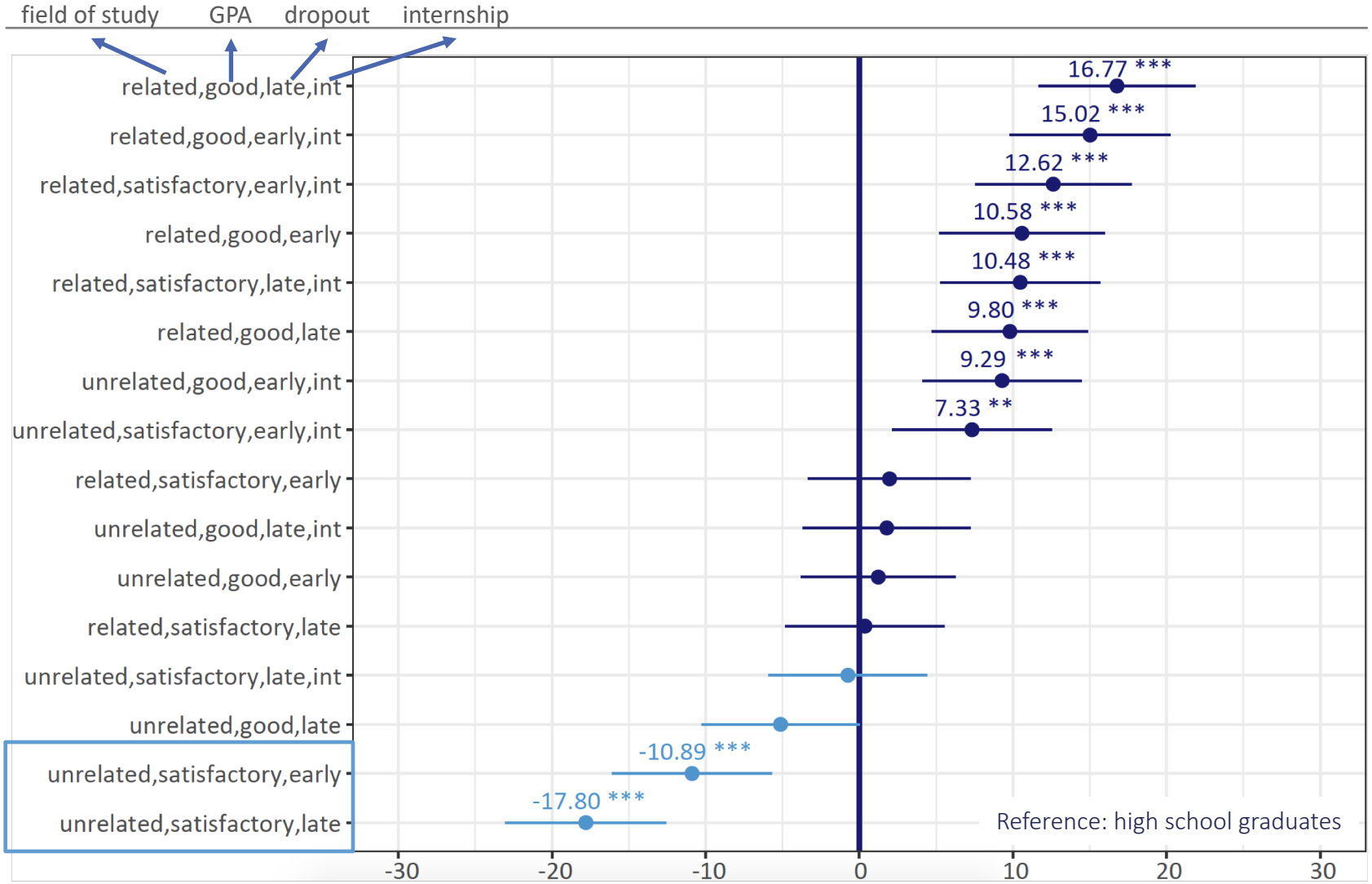

Results

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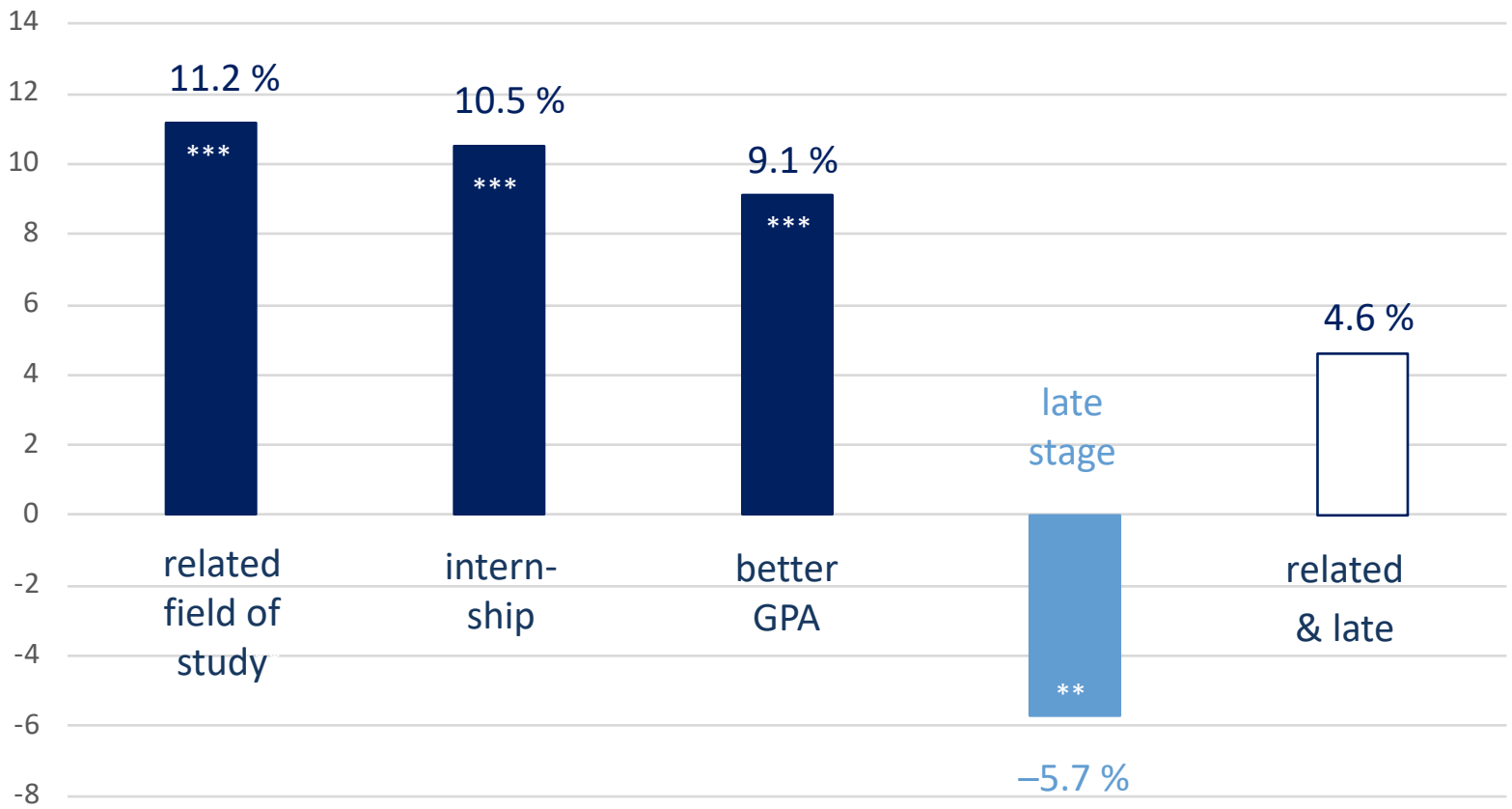
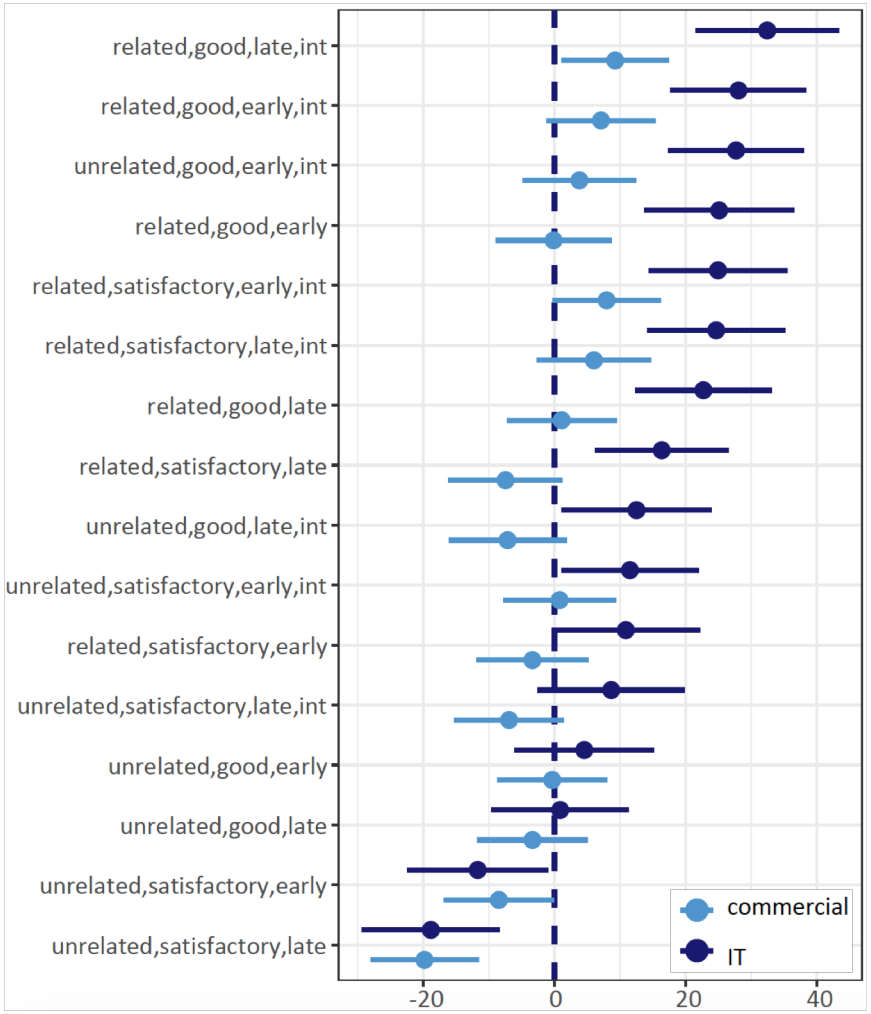


Note. The model controls for further vignette dimensions, employers‘ characteristics, set and order effects.

Results

3. differences by occupational field

	IT	commercial
	coeff (SE)	*coeff (SE)*
dropout	**13.81 (1.49)**	–1.25 (1.07)
Constant	102.37 (19.59)	132.75 (16.75)
N employers	286	275
N vignettes	2288	2200
Log likelihood	–1117.4	–355.8
Std Dev employers	27.02	23.45
Std Dev vignettes	35.64	25.10
rho	.37	.46



Results

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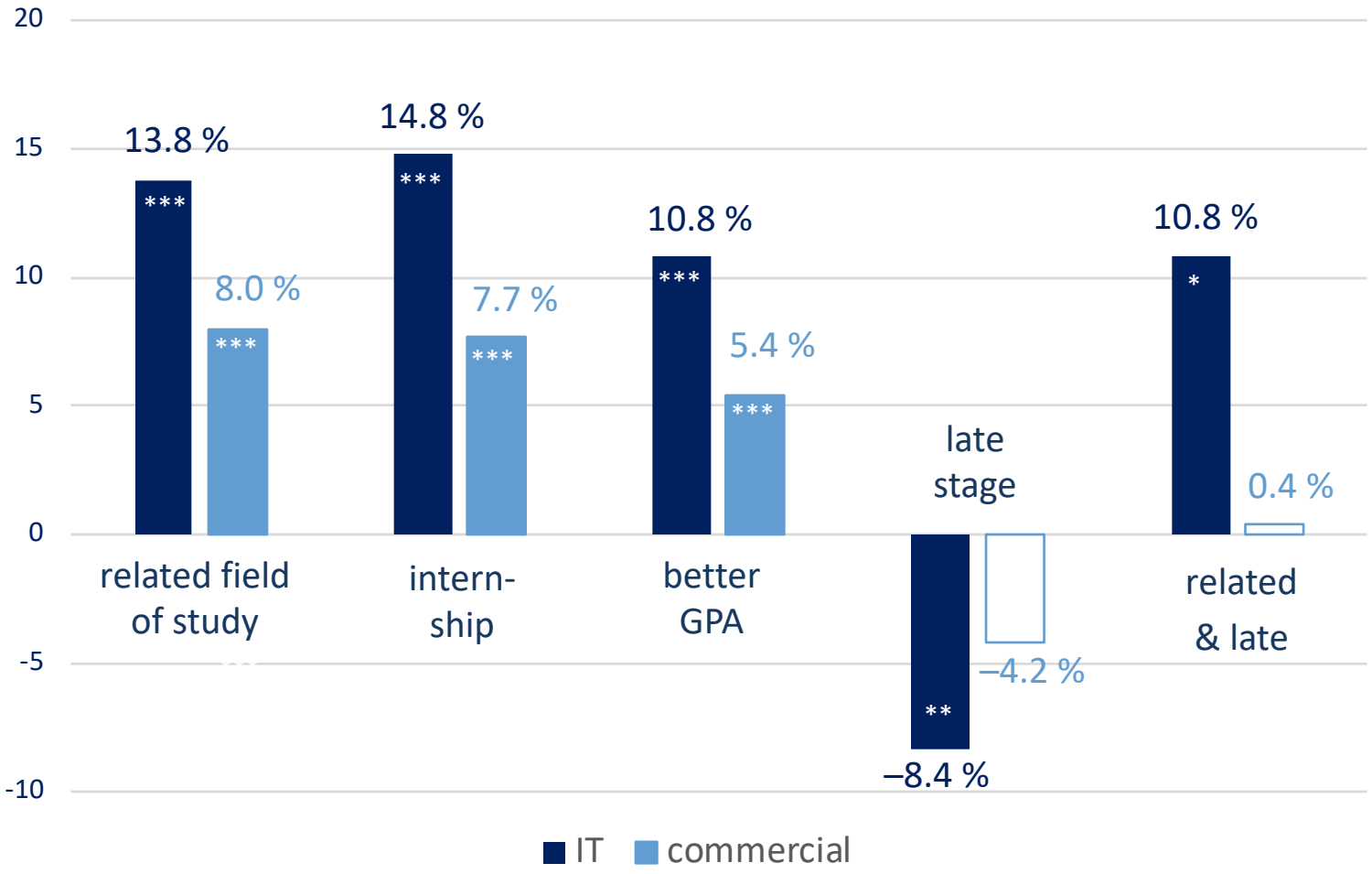

Results

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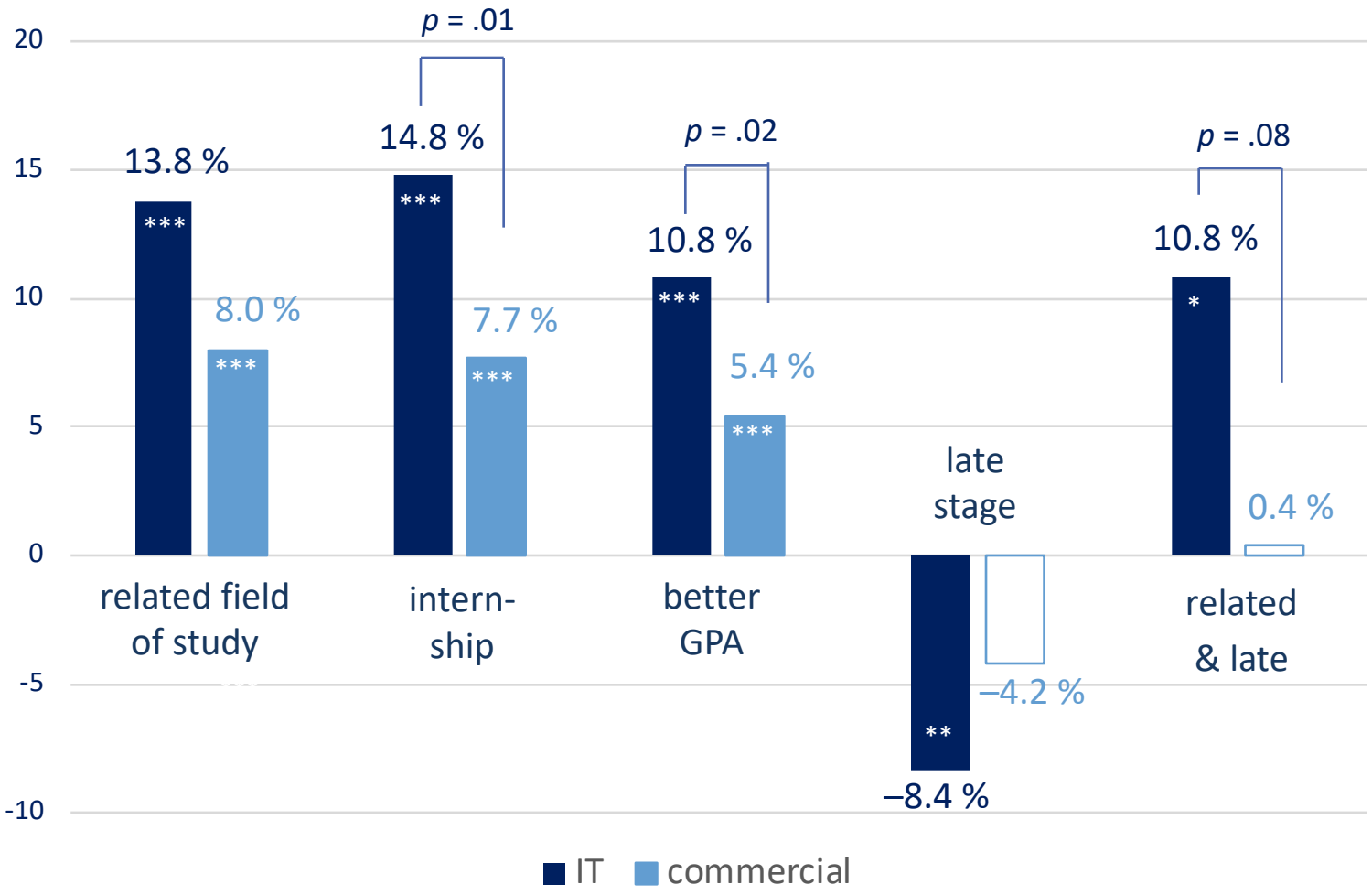

Discussion

Summary

- Employers screening *IT* apprenticeship applicants rate dropouts vis-à-vis high school graduates *positive* (high transferability of skills)
- Employers screening *commercial* apprenticeship applicants rate dropouts vis-à-vis high school graduates *neutral* (low transferability)
- For both fields: Employers evaluation positively influenced by signals for
  - High scholastic ability
  - occupation-specific skills
  - affinity/interest in the job
- dropping out at a *later stage* is negatively evaluated by employers when the chosen field of study was not job-relevant

Discussion

Robustness Checks

- results remain robust if analyses were conducted
  - for the likelihood to *hire* the candidate as dependent variable
  - without respondents with *low response times* for the vignette module
  - when running models with *first vignettes only*

Limitations

- hypothetical decisions ≠ real behavior
- in total, effects are rather small but comparable to other hiring simulation studies
  (e.g. DiStasio & van de Werfhorst, 2016; Piopiunik et al., 2018)
- Gender? Other fields? …

Next steps

- (Applicant char., job char.) + employer and labor market characteristics
- Other pathways / labor markets

Thank you for your attention.

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