

Swiss Leading House

Economics of Education · Firm Behaviour · Training Policies

Premature Apprenticeship Terminations: An Economic Analysis (Donata Bessey and Uschi Backes-Gellner)

Conference on Economics of Education, Firm Behavior, and Training Policies

University of Zurich, June 26, 2008



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Motivation (1)

- Scarcity of apprenticeship places in CH and GER
- 20 – 25 % of all apprenticeship contracts terminated before completion - not necessarily dropouts
- An early termination can lead to...
 - **Changing**
 - **Upgrading**
 - **Dropping out** (risky!)
- Importance of dropouts: 10 – 23 % of youths with an early termination stop any educational attainment afterwards (different data sets, CH, D)

Motivation (2)

- Problematic: Dropout behavior (changers: bad match, even efficient)
- Higher level of education => higher income, lower risk of unemployment

	Without appr.	Apprenticeship	University degree
Unempl. rate	26.3 %	9.9 %	4.5 %

Source: Arbeitsmarkt in Zahlen 2003

- Reasons for this (at least at first sight) irrational behavior? Really irrational to drop out?
- Oreopoulos (2005): dropping out difficult to explain with the standard human capital model

Research Question

- Focus of this work:
 - **dropout** determinants as compared to **changers and upgraders**
 - Policy implications (for firms and teachers): How can dropouts be avoided?
- Previous research on the topic from an economic perspective: none (up to my knowledge)
- **New about our approach**: clear-cut background, new data set

Plan of Talk

- Theoretical Considerations
- The Data Set, Descriptive Statistics
- Estimation Results
- Conclusion

Theory (1): Human Capital

- Rational individuals decide over their investment in education using discounted costs and earnings streams
- **Dropouts** from a human-capital (rational) point of view:
(NPV < 0) => dropping out is rational!
- Data set allows for an analysis based on this approach (using proxies for costs, benefits, time preference)
- We analyze the decision to **continue** an apprenticeship

Theory (2): Regional Labor Markets

- Extreme regional differences in patterns of behavior - reason?
- Model by Wheeler (2001): stronger incentives to invest in human capital in thicker labor markets (better matches => higher wages)
- We incorporate a regional weighting factor for the **benefits** in the classical HC model, but not for the costs
- Implicitly: matching argument, but still static model

Theory (3): Summary

The “standard” model for any investment (e.g., in human capital)

$$NPV = \int_t^T R_i e^{-ri} di - \int_0^t C_i e^{-ri} di$$

=> include a weighting factor μ in $[0,1]$ that captures local labor market conditions for benefits:

$$apprenticeship = \begin{cases} 0 & \text{if } \int_0^t C_i e^{-ri} di > \mu_g \int_t^T R_i e^{-ri} di \\ 1 & \text{if } \int_0^t C_i e^{-ri} di \leq \mu_g \int_t^T R_i e^{-ri} di \end{cases}$$

- Incentives to invest in general
- Importance of labor market thickness (extreme case: $\mu = 0$)

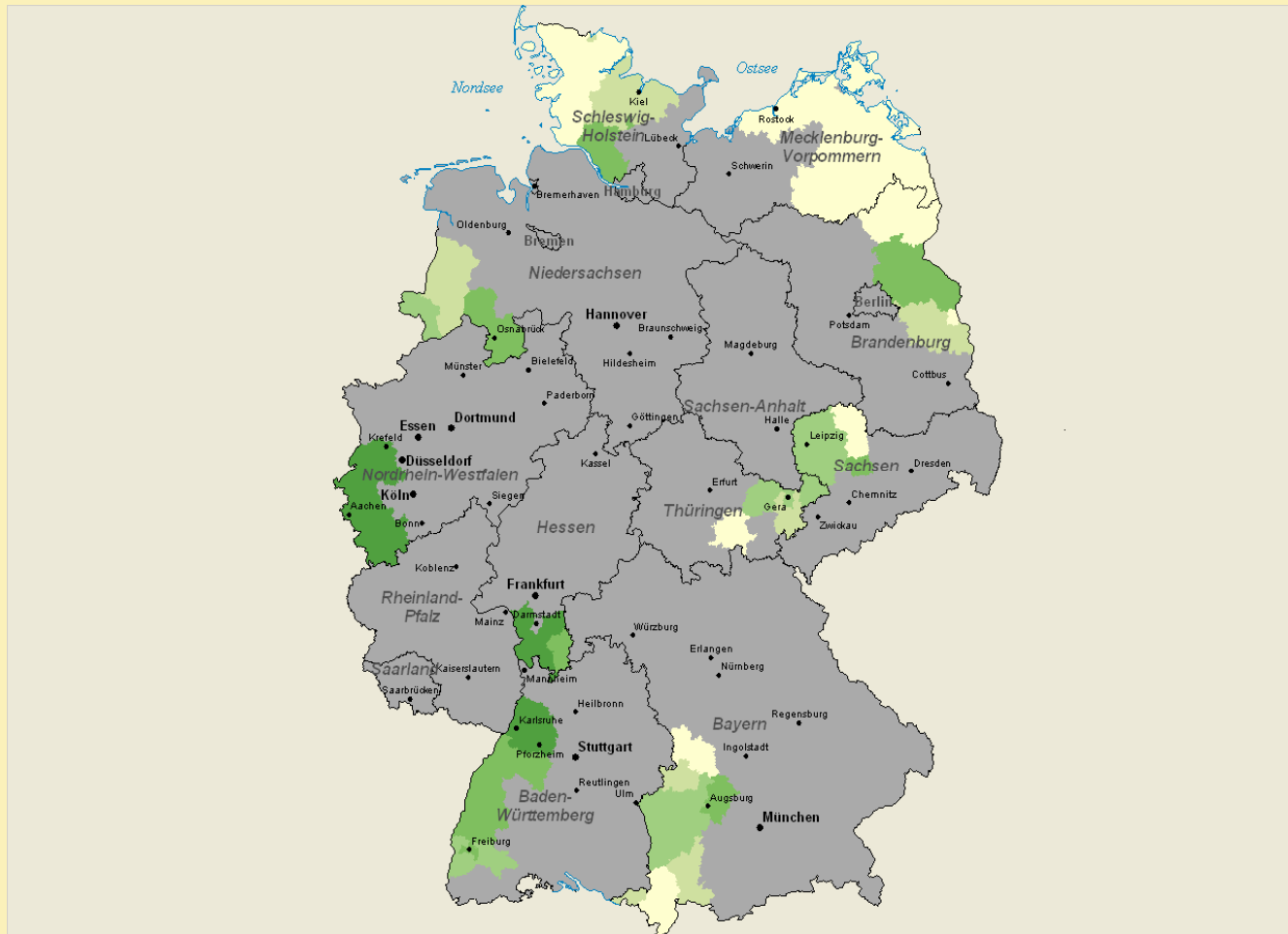
Testable Hypotheses

- Incentives to complete an apprenticeship:
 - Incentives to complete \uparrow when costs lower, benefits higher, patience of individual higher
 - Incentives \uparrow in thicker labor markets

The BiBB Data Set (1)

- Questionnaire and survey realized by BiBB in 2000/2001 („Vertragslösungen 2002 – Strukturen und Gründe“)
 - $n = 1,557$
 - 7 chambers of commerce and industry (IHK),
6 chambers of crafts (HWK)
 - Regional provenance: IHKs Kiel, Leipzig, Mittlerer Niederrhein, Freiburg, Frankfurt/Oder, Darmstadt, Augsburg
 - HWKs Rostock, Osnabrück, Aachen, Ostthüringen, Flensburg, Karlsruhe
- => Allows to include regional characteristics!

The Chamber Districts

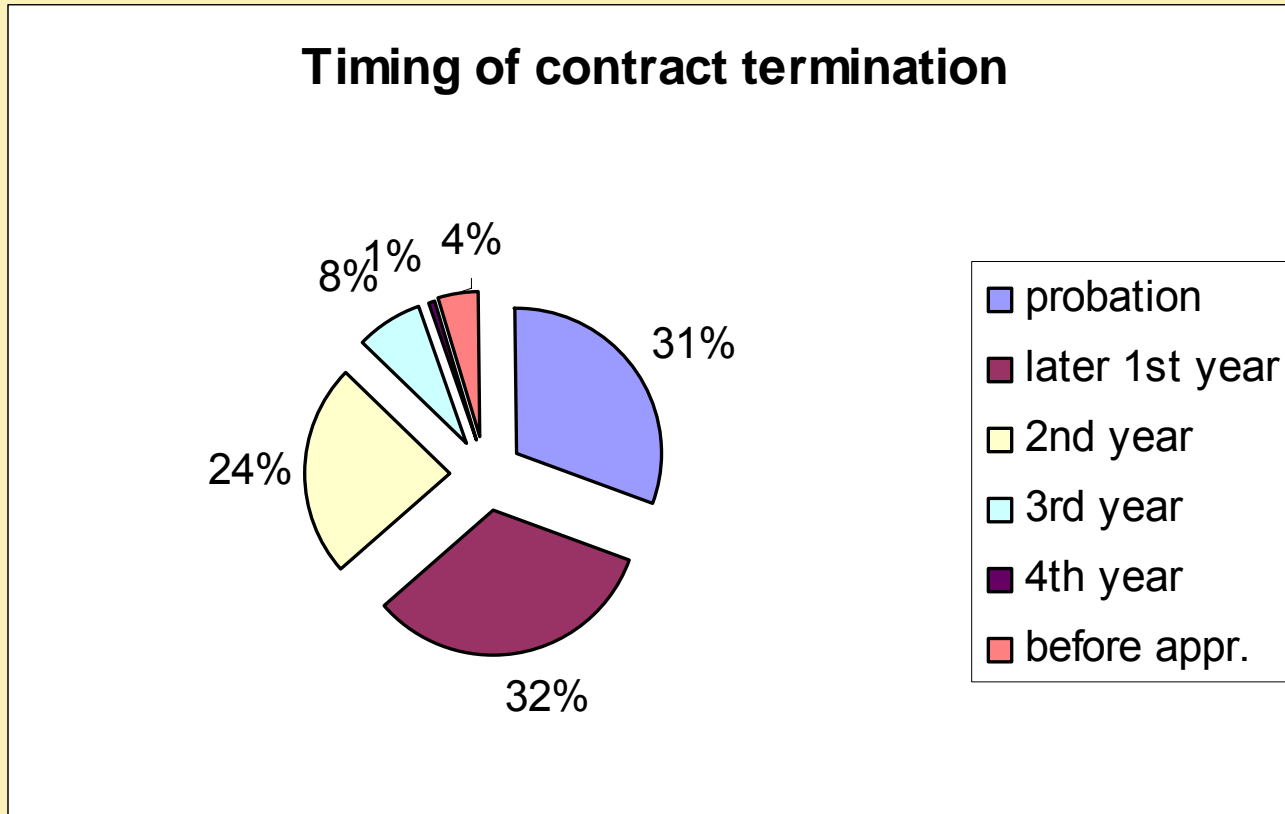


The BiBB Data Set (2)

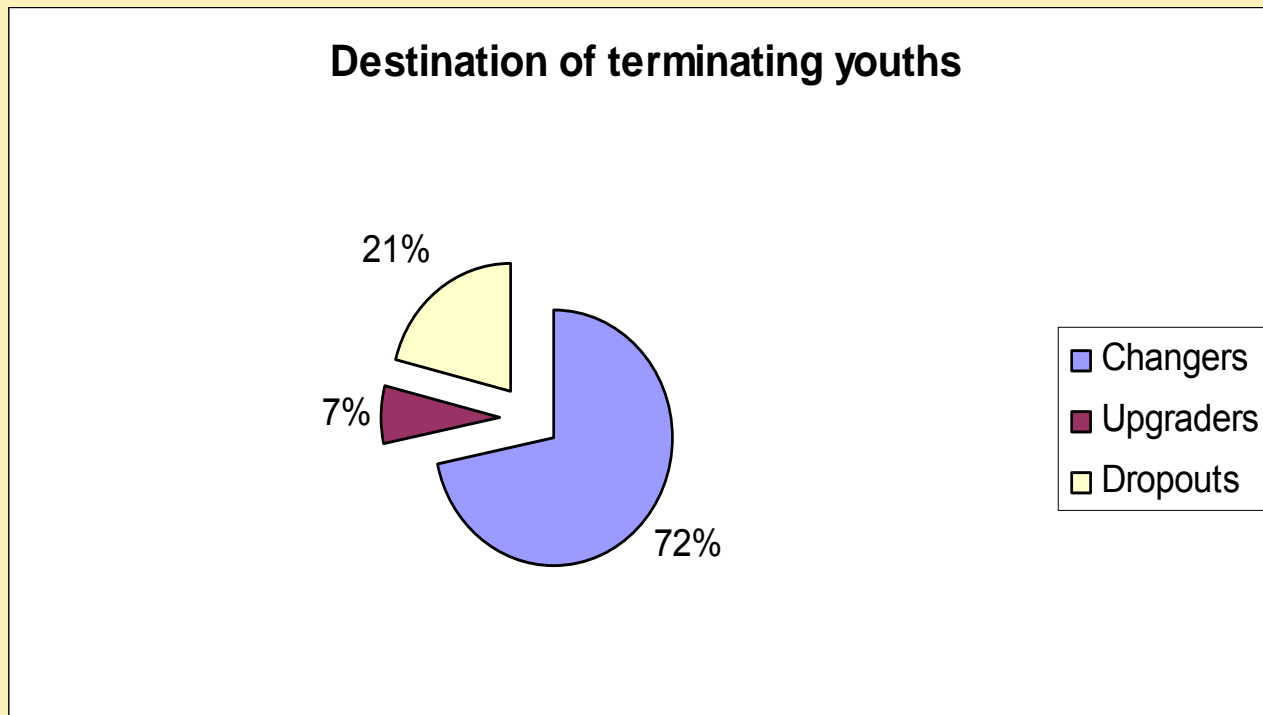
Questions include...

- current status
- firm-level reasons (overtime work, clash with boss/colleagues, low quality of in-firm training...)
- job-related reasons (wrong idea, bad prospects...)
- school-related reasons (bad teaching quality, clash with teachers, exam nerves...)
- personal reasons (health problems, financial distress, relocation...)
- timing (year of apprenticeship)
- type of school-leaving diploma, native tongue, occupation chosen
- firm size
- Former work with the data set: only descriptive statistics

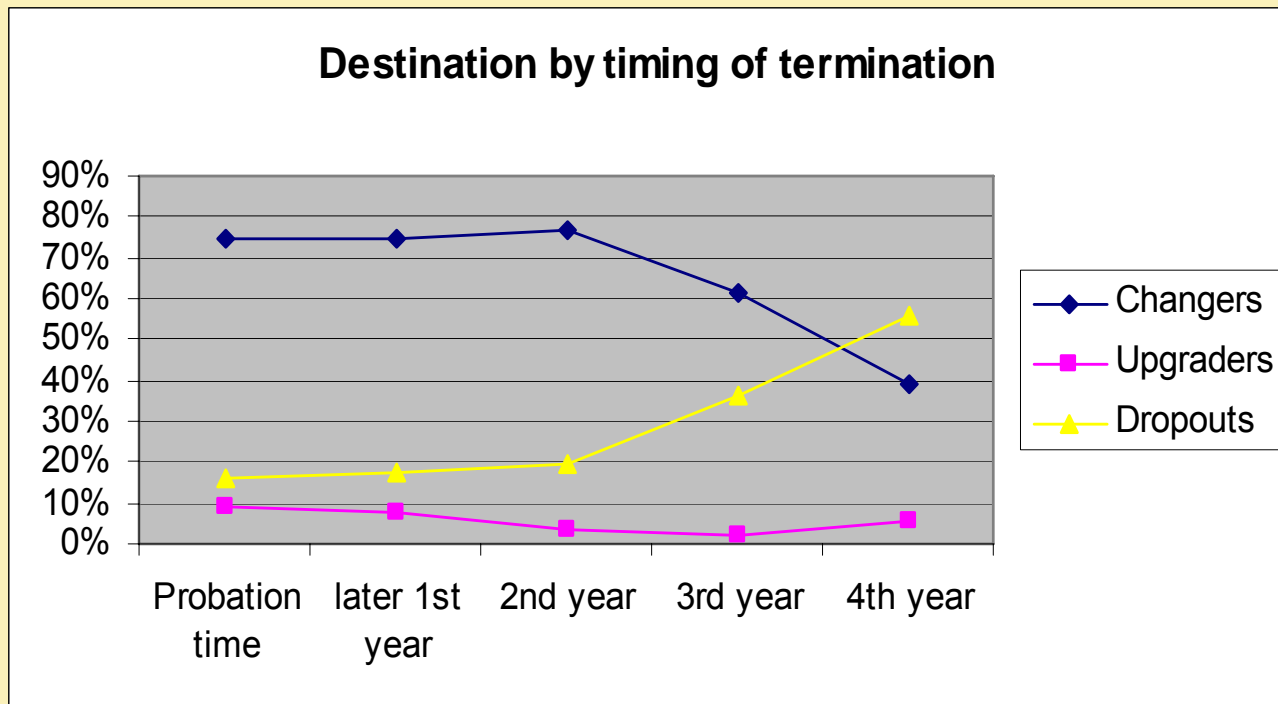
Descriptives (1)



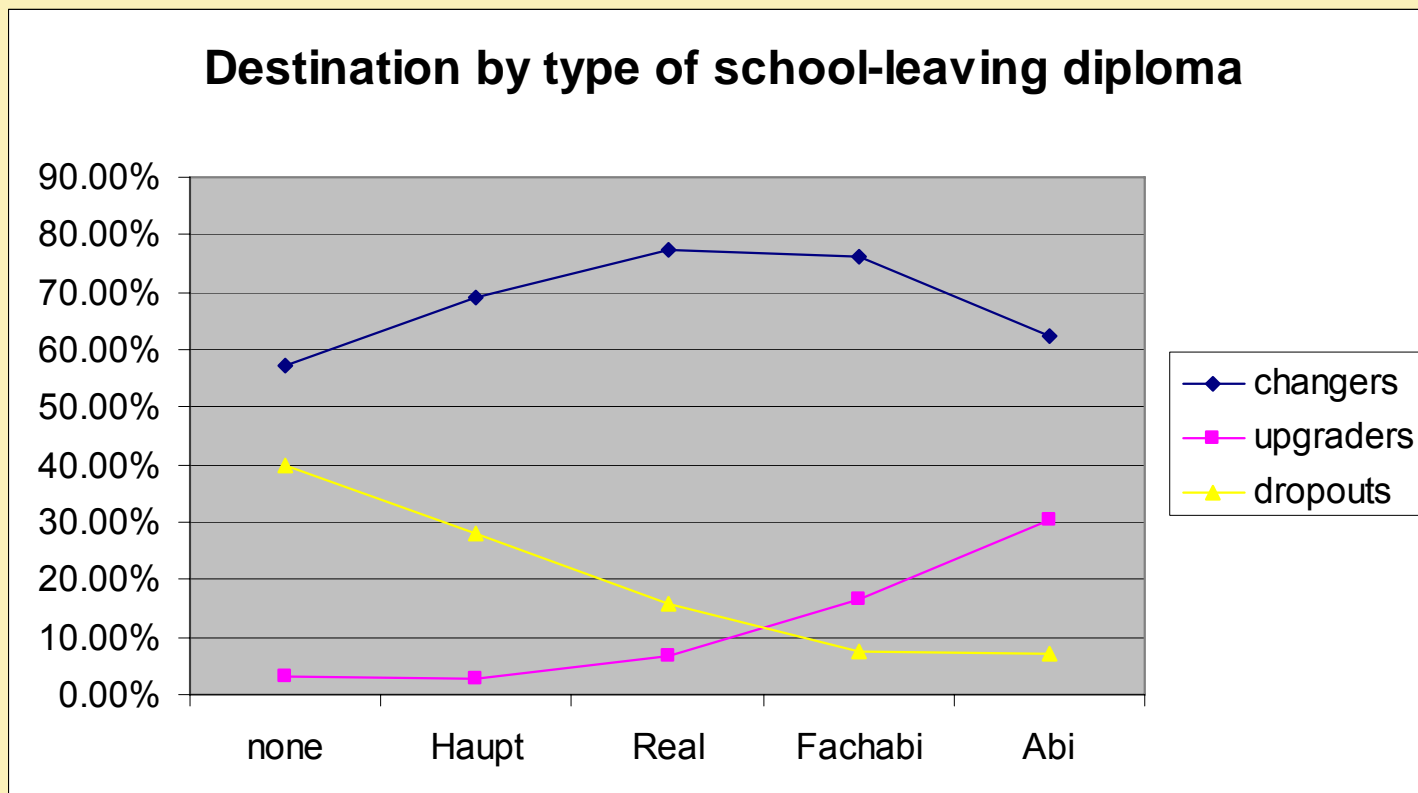
Descriptives (2)



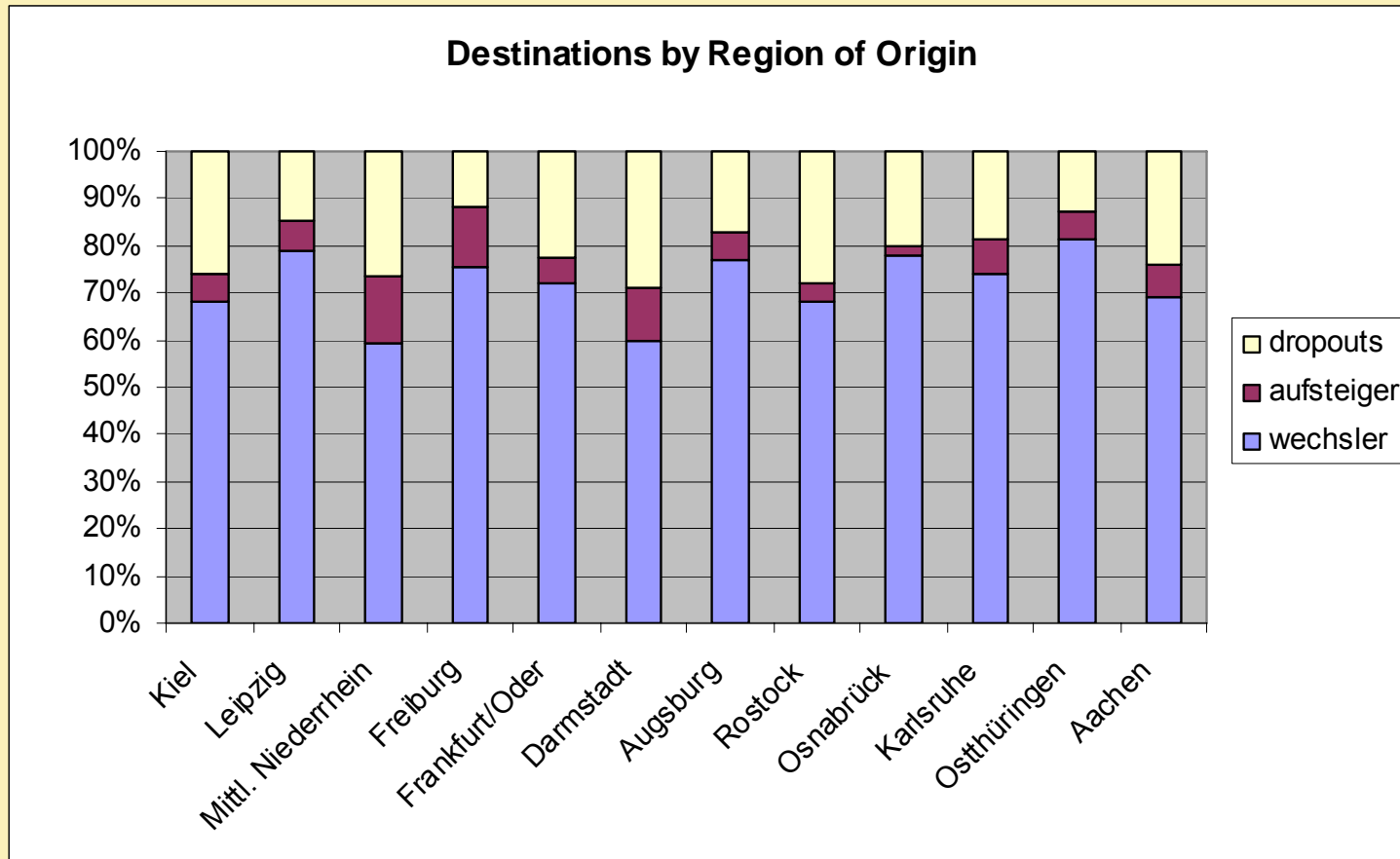
Descriptives (3)



Descriptives (4)



Descriptives (5)



Upshot of descriptive evidence, implications for estimation strategy

- Timing and prior level of schooling
- Regional differences – Model by Wheeler (2001): better matches in bigger labor markets => more investment in human capital
- Proxies for costs, benefits, time horizon
- Add more (non-monetary) cost- and benefit-related variables:
 - girls in male occupations and vice versa
 - opportunity costs of an apprenticeship (wages for unskilled)
 - regional information

Estimation strategy

- We estimate a logit/probit model for the following baseline equation...

$$dropout_{ij} = \beta_1 x_{ij} + \beta_2 x_i + \beta_3 x_j + u_{ij}$$

- ij: individual-and regional-level characteristics (benefits)
- i: individual-level characteristics (schooling)
- j: regional-level characteristics (labor market)
- error term u: we adjust for clustering on regions
- NB: not efficient estimation strategy but results handier to interpret
- The **control groups** are changers/changers and upgraders/bankruptcy victims

Estimation strategy (2)

Assumption: apprentices in bankrupt firms can be treated as “successful” apprentices and hence provide a third control group

	Bankruptcy victims	Entire sample
dropouts	0.0963	0.2112
changers	0.8464	0.7160
upgraders	0.0500	0.0728
n	280	1676

Empirical Results (1)

	Model 1	Model 2	Model 3
Boy in female job	-0.016 [0.029]	-0.027 [0.031]	0.068 [0.049]
Girl in male job	0.057* [0.030]	0.063* [0.033]	0.061 -0.084
Exam nerves	0.129* [0.086]	0.132* [0.087]	0.327*** [0.048]
Financial distress	0.178*** [0.050]	0.184*** [0.052]	0.272*** [0.042]
Bad prospects	-0.045 [0.06]	-0.041 [0.07]	0.066 [0.219]
Bad income prospects	0.058 [0.048]	0.053 [0.05]	0.276*** [0.096]
Bad career prospects	-0.051 [0.052]	-0.056 [0.062]	-0.065 [0.177]
Regional unemployment rate	2.087*** [0.417]	2.358*** [0.425]	0.162 [1.066]
Percentage in out-of-firm training	-0.434*** [0.091]	-0.493*** [0.091]	-0.011 [0.334]
Population density	-0.014 [0.023]	-0.013 [0.024]	-0.104 [0.064]
Supply-demand ratio on the apprentice market	-0.076*** [0.023]	-0.085*** [0.025]	-0.125** [0.060]
Transport smoothness	0.031 [0.019]	0.034* [0.019]	0.108 [0.049]**
Migration background	0.063 [0.049]	0.068 [0.053]	0.043 [0.101]
Female	-0.067*** [0.016]	-0.08*** [0.019]	0.071 [0.055]
<i>n</i>	1556	1443	572
LogL	-702.47268	-684.25346	-313.59713
Pseudo R^2	0.1131	0.1053	0.1959
Controls in all models	firm size	field, year	schooling

Results from a probit model,
marginal effects,
clustering-robust S.E.s

Empirical Results (2)

	Model 1	Model 2	Model 3
financialincentive	0.281 [0.185]	0.324* [0.195]	0.074 [0.382]
mig	0.052 [0.069]	0.057 [0.075]	-0.018 [0.121]
female	-0.031 [0.030]	-0.038 [0.034]	0.115 [0.085]
boygirlsjob	-0.007 [0.033]	-0.016 [0.036]	0.055 [0.063]
girlboysjob	0.077* [0.045]	0.088* [0.047]	-0.016 [0.086]
badprospects	-0.026 [0.065]	-0.039 [0.072]	-0.247 [0.180]
badincomeprospects	0.113* [0.061]	0.109* [0.065]	
badcareerpros	-0.059 [0.074]	-0.05 [0.090]	0.360** [0.145]
examnerves	0.105 [0.092]	0.107 [0.089]	0.412*** [0.072]
findistress	0.266*** [0.075]	0.280*** [0.078]	0.341*** [0.038]
percubue2	-0.428*** [0.163]	-0.476*** [0.164]	0.122 [0.487]
labmarket2001	0.01 [0.029]	0.014 [0.030]	-0.207*** [0.073]
supdem2001	-0.130*** [0.030]	-0.140*** [0.037]	-0.282*** [0.096]
accpop	0.019 [0.023]	0.02 [0.024]	0.188*** [0.060]
unempl01	2.002*** [0.508]	2.241*** [0.582]	0.56 [1.633]
<i>n</i>	876	809	343
LogL	-404.69866	-393.66299	-189.47774
Pseudo <i>R</i> ²	0.1263	0.1166	0.2013

Results from a probit model,
marginal effects,
clustering-robust S.E.s

Sensitivity Analysis

- Estimate a multinomial model for the different paths and use (again) the bankruptcy victims as a control group
- Results do not change
- Still To Do: take time into account

Summary

- Analysis using human capital theory with a spatial component
- Evidence for importance of short-term (non-monetary) cost of an apprenticeship and local labor market situation
- Decision to drop out: from an individual's point of view **rational in a short-term perspective (but probably not in the long run)**
- Tentative Policy Implications
 - Regional level: mobility
 - Individual level: case management

Thank you for your attention