

Vocational Training Dropouts: The Role of Secondary Jobs

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- The German dual system of vocational training is a role model for other countries.
- But:
 - ▶ More individuals start to study
 - ▶ Cancellation rate increases
- Not every cancellation is problematic.
- Important to distinguish between dropout, changers and upgraders.
- Dropout bears the highest risk of becoming unemployed.

Secondary job and dropout behaviour:

- Shisko and Rostker (1976): Secondary job; Wage(+)
- Winters (2010): Secondary job: Hours spend on primary job; Secondary job (-)
- Bessey and Backes-Gellner (2008): Dropout; Hazard rate model; Opportunity costs and financial distress (+)
- Beicht and Krewerth (2010): Logit regression; Satisfaction with remunerations; Comparison to class mates, the need for a secondary job (-)
- Levy-Garboua et al. (2007) and Green (2010): Dropout; Job satisfaction (+)

Data Description

- “BIBB Survey Vocational Training from the Trainees Point of View 2008” is used for all of the following descriptive statistics and results.
- Survey covers:
 - ▶ 5901 apprentices in their second year of vocational education
 - ▶ 340 school classes
 - ▶ 205 vocational schools
 - ▶ Hamburg, Hesse, North Rhine Westphalia, Baden-Württemberg, Brandenburg, Thuringia
 - ▶ 15 occupations
- Survey period: 2008

Summary Statistics I

Table 1: Summary Statistics - Part I

Variables	MEAN	SD	N	MIN	MAX
Dropout	0.35		4621	0	1
Secondary job					
No secondary job	0.75		4621	0	1
Secondary job, need money for living	0.07		4621	0	1
Secondary job, need money for wishes	0.08		4621	0	1
Secondary job, need money for both	0.10		4621	0	1
Sex					
Female	0.39		4621	0	1
Mig. background	0.16		4621	0	1
Age					
Age: 15-19	0.38		4621	0	1
Age: 20-24	0.56		4621	0	1
Age: 25-30	0.06		4621	0	1
Region: West Germany	0.75		4621	0	1
Highest school degree					
No degree	0.01		4621	0	1
Sonderschulabschluss	0.00		4621	0	1
Hauptschulabschluss	0.21		4621	0	1
Realschulabschluss	0.50		4621	0	1
Hochschulreife	0.27		4621	0	1
Other degree	0.01		4621	0	1

Summary Statistics II

Table 2: Summary Statistics - Part II

Variables	MEAN	SD	N	MIN	MAX
Grade: German	2.73	0.76	4621	1	6
Grade: Math	2.74	0.96	4621	1	6
Income					
Income: 0-400 Euro	0.42		4621	0	1
Income: 400-600 Euro	0.45		4621	0	1
Income: 600-1500 Euro	0.13		4621	0	1
Evaluation of chosen occupation					
Dream job	0.29		4621	0	1
Interesting occupation	0.42		4621	0	1
Alternative occupation	0.17		4621	0	1
Compensation	0.08		4621	0	1
Do not know	0.04		4621	0	1
Grade for VET	2.61	0.93	4621	1	6
Type of occupation					
Craft	0.38		4621	0	1
Business	0.30		4621	0	1
Service	0.32		4621	0	1

Descriptive Statistics

Table 3: Characteristics by secondary job

Reason for secondary job	No secondary job	Money for living	Money for wishes	Money for both	Total
Sex					
Men	60.5%	61.1%	76.1%	60.0%	61.8%
Women	39.5%	38.9%	23.9%	40.0%	38.2%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Income					
0 - 400	40.4%	55.5%	45.0%	52.4%	43.0%
400 - 600	46.0%	37.8%	41.3%	40.1%	44.4%
600 - 1500	13.6%	6.7%	13.7%	7.4%	12.5%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Highest school degree					
No degree	0.8%	0.7%	1.5%	0.4%	0.8%
Abschluss einer Sonderschule	0.7%	0.5%	0.4%	0.5%	0.6%
Hauptschulabschluss	20.6%	35.5%	25.5%	21.2%	22.1%
Realschulabschluss, Fachoberschulreife	50.5%	43.7%	49.7%	54.0%	50.3%
Hochschulreife/Abitur, Fachhochschulreife	26.8%	19.4%	22.7%	23.6%	25.6%
Other degree	0.7%	0.2%	0.2%	0.4%	0.6%
Total	100.0%	100.0%	100.0%	100.0%	100.0%
Dropout					
No	76.6%	60.6%	79.2%	72.5%	75.3%
Yes	23.4%	39.4%	20.8%	27.5%	24.7%
Total	100.0%	100.0%	100.0%	100.0%	100.0%

- Becker (1962): Highest net present value is important for educational choice.
- Bessey and Backes-Gellner (2008): Revision of an earlier educational choice is possible.

Method I

Probit regression:

$$Pr(y = 1|X) = \Phi(X\beta), \quad (1)$$

$$y_i^* = \beta_0 + \beta_1 x_i + \dots + \beta_k x_{ik} + \varepsilon_i, \quad (2)$$

where ε is i.i.d. with a standard normal distribution and independent of x_j :

$$\varepsilon|x_j \sim N(0, 1). \quad (3)$$

Assuming that the utility of staying in apprenticeship of apprentice i is denoted by:

$$U_i^{VET} = x'_i \alpha^{VET} + \mu_i^{VET} \quad (4)$$

and the utility of an alternative is denoted by:

$$U_i^{Alt} = x'_i \alpha^{Alt} + \mu_i^{Alt}. \quad (5)$$

Individuals choice of dropping out of apprenticeship:

$$y_i = \begin{cases} 0, & y_i^* = U_i^{Alt} - U_i^{VET} = x_i' \beta + \varepsilon_i < 0 \\ 1, & y_i^* = U_i^{Alt} - U_i^{VET} = x_i' \beta + \varepsilon_i \geq 0 \end{cases} \quad (6)$$

where $\beta \equiv \alpha^{Alt} - \alpha^{VET}$ and $\varepsilon \equiv \varepsilon^{Alt} - \varepsilon^{VET}$.

Results I

Table 4: The intention of dropping out of apprenticeship

	Model A margins/se	Model B margins/se	Model C margins/se	Model D margins/se
No secondary job (reference category)				
Secondary Job, money for living	.1906038*** (.0265727)	.1443885*** (.0249986)	.2047276*** (.0266946)	.1526006*** (.0251648)
Secondary Job, money for extra wishes	-.0031436 (.0242106)	.0123822 (.0230316)	-.0016288 (.0243474)	.0123807 (.0231421)
Secondary Job, money for living and wishes	.046326* (.0219617)	.0337408+ (.0205017)	.0578124** (.0221984)	.0395542+ (.0206731)
Female	.0548581** (.0205357)	.0546023** (.0192626)	-.0069068 (.0170819)	.0071111 (.0161202)
Income: 0 - 400 Euro (reference category)				
Income: 400 - 600 Euro	-.0419356* (.0186932)	-.0182357 (.0173504)	-.0548139** (.0168035)	-.03424* (.0155835)
Income: 600 - 1500 Euro	-.1227885*** (.0272185)	-.0814021** (.0261277)	-.1486626*** (.0240731)	-.1007315*** (.023519)
Grade for VET		.1598508*** (.0061824)		.1606278*** (.0061322)
Craft (reference category)				
Business			.0369024+ (.0212571)	.0310062 (.0198579)
Service			.1081258*** (.0202935)	.1023666*** (.0190553)
Occupation dummies	Yes	Yes	No	No
N	4621	4621	4621	4621
LogL	-2601.79	-2334.54	-2601.79	-2334.54

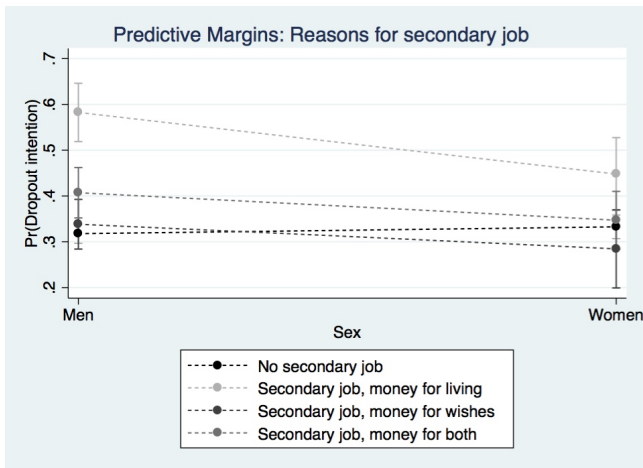
Notes: Table contains average marginal effects and standard errors in parentheses.

Controls for: Firm size, highest school degree, region, migration background, age, school performance

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Results II

Figure 1: Predictive margins for the intention to drop out by sex and secondary job



Results III

Table 5: Intention of dropping out of apprenticeship by sex and secondary job

Sex@Secondary job	Model E margins/se/ci95
(Secondary job, money for living vs. No secondary job) Men	.2628866 *** .0347881 .1947032, .3310701
(Secondary job, money for living vs. No secondary job) Women	.1197761 ** .0421118 .0372385, .2023137
(Secondary job, money for wishes vs. No secondary job) Men	.0197341 .0275928 -.0343469, .073815
(Secondary job, money for wishes vs. No secondary job) Women	-.0521189 .0489176 -.1479957, .0437579
Secondary job, money for both vs. No secondary job) Men	.0863816 ** .0285918 .0303427, .1424205
Secondary job, money for both vs. No secondary job) Women	.0153169 .0356348 -.054526, .0851598
Joint	***

Notes: Table reports average marginal effects. Estimations from model E are based on Model C

+ $p < 0.10$ * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Conclusion

- The results show that when a secondary job becomes necessary, the probability of thinking about dropping out of apprentices increases.
- The results indicate extra burdens on apprentices caused by the secondary job make a dropout more likely.
- Overall, the results indicate no differences between sex.
- BUT: For men a dropout is more likely when they have to earn extra money to cover living costs.
- Recommendation: Basic income.

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Table 6: Intention to drop out of apprenticeship (Robust)

	Model A margins/se	Model B margins/se	Model C margins/se	Model D margins/se
Secondary Job, money for living	.1906038*** (.0268484)	.1443885*** (.02573)	.2047276*** (.0270756)	.1526006*** (.025999)
Secondary Job, money for extra wishes	-.0031436 (.0239767)	.0123822 (.0227294)	-.0016288 (.0240013)	.0123807 (.0228714)
Secondary Job, money for living and wishes	.046326* (.021959)	.0337408+ (.0202264)	.0578124** (.0220505)	.0395542+ (.0202601)
Female	.0548581** (.0205156)	.0546023** (.0193742)	-.0069068 (.0172103)	.0071111 (.0163709)
Migration	.0476107* (.0190659)	.0440979* (.0179448)	.0399352* (.0189065)	.0373789* (.0179023)
Age: 20-24	-.0151961 (.0155927)	-.0145069 (.0145026)	-.0154737 (.0156593)	-.0137781 (.0145557)
Age: 25-30	-.1404372*** (.0269702)	-.1306166*** (.025221)	-.1451736*** (.0265362)	-.1396746*** (.0248095)
Region: West Germany	.0193152 (.0165985)	.0079522 (.0157101)	.0247007 (.0164207)	.012779 (.0155196)
Grade: German	-.0140048 (.0090924)	-.0121669 (.008545)	-.010635 (.0091499)	-.0101716 (.0086116)
Grade: Math	.0293837*** (.0070684)	.0210743** (.006619)	.0278606*** (.0071322)	.0189708** (.0066548)
Income: 400 - 600 Euro	-.0419356* (.0186871)	-.0182357 (.0172686)	-.0548139** (.0167227)	-.03424* (.0154238)
Income: 600 - 1500 Euro	-.1227885*** (.0267526)	-.0814021** (.025687)	-.1486626*** (.0235561)	-.1007315*** (.0228767)
Interesting Occupation	.1052153*** (.0150597)	.0660748*** (.0149682)	.0799309*** (.0150912)	.0490867*** (.0146306)
Alternative Occupation	.2062273*** (.0213512)	.1297463*** (.0203545)	.1673833*** (.020624)	.1054287*** (.0192756)
Compensation	.3814026*** (.0296993)	.2270599*** (.0304412)	.3306211*** (.028731)	.1943085*** (.0283585)
Do not know	.332212*** (.036731)	.1816809** (.0358555)	.3032328*** (.0374231)	.168551*** (.0361919)
Grade for VET		.1598508*** (.00631)		.1606278*** (.0062414)
Business			.0369024+ (.0211183)	.0310062 (.0195753)
Service			.1081258*** (.0205541)	.1023666*** (.0193786)
N	4621	4621	4621	4621

Notes: Table contains average marginal effects and standard errors in parentheses.

Controls for: Firm size, highest school degree, region, migration background, age, school performance

+ $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 7: Heterogenous probit model (A): Probability of dropping out of training

	Model A.1 margins/se	Model A.2 margins/se
Secondary Job, money for living	.1924113*** (.0265245)	.1989773*** (.0271389)
Secondary Job, money for extra wishes	-.0013416 (.0235889)	.0062633 (.0230581)
Secondary Job, money for living and wishes	.0413913 (.0216305)	.0422095* (.0215016)
Female	.0513926* (.0199662)	.0514162* (.0203582)
Migration	.0521597** (.018833)	.0519311** (.0195288)
Age: 20-24	-.0122014 (.0154988)	-.0071904 (.0156519)
Age: 25-30	-.1335274*** (.0264846)	-.1277964*** (.0271632)
Region: West Germany	.0171762 (.0161881)	.0166868 (.0158195)
Grade: German	-.0107911 (.009026)	-.0118144 (.0089648)
Grade: Math	.0274086*** (.0070114)	.0290017*** (.0070954)
Income: 400 - 600 Euro	-.0388669* (.0185278)	-.0358053 (.018358)
Income: 600 - 1500 Euro	-.1177902*** (.0266376)	-.115162*** (.0266175)
Interesting Occupation	.1065165*** (.0152965)	.1088874*** (.0151014)
Alternative Occupation	.2080601*** (.0209287)	.2102312*** (.0209856)
Compensation	.3801966*** (.0287284)	.3790204*** (.0293833)
Do not know	.3289545*** (.0349783)	.3393911*** (.0356523)
Choice equation	Model A	Model A
Variance equation	occupation	occupation, migration, age, sex
N	4621	4621

Standard errors in parentheses

Margins: average margins

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 8: Heterogenous probit model (B): Probability of dropping out of training

	Model B.1 margins/se	Model B.2 margins/se
Secondary Job, money for living	.1471156** (.0250659)	.1515862*** (.0254695)
Secondary Job, money for extra wishes	.0157604 (.0227771)	.0191781 (.0222584)
Secondary Job, money for living and wishes	.0287648 (.0203598)	.0281772 (.0203659)
Female	.0510017** (.0189059)	.0465139* (.0188904)
Migration	.0461535** (.0176411)	.0476765** (.0180934)
Age: 20-24	-.0124122 (.0145709)	-.0111595 (.0145021)
Age: 25-30	-.1239557*** (.0253408)	-.1254354*** (.0259525)
Region: West Germany	.0059542 (.0154728)	.0053486 (.0152133)
Grade: German	-.0107111 (.0085125)	-.011059 (.0084591)
Grade: Math	.0189755** (.0066853)	.019063** (.0067027)
Income: 400 - 600 Euro	-.0149772 (.0172852)	-.013201 (.0171266)
Income: 600 - 1500 Euro	-.0773** (.0257731)	-.0773734** (.0254734)
Interesting Occupation	.0676949** (.0153521)	.0685346** (.0152739)
Alternative Occupation	.1345068*** (.0204434)	.1359172*** (.0204911)
Compensation	.2290039** (.0290999)	.2332913*** (.0296172)
Do not know	.1839349** (.03424)	.1898052*** (.0346509)
Grade for VET	.1597163*** (.0062071)	.1589686*** (.0062131)
Choice equation	Model B	Model B
Variance equation	occupation	occupation, migration, age, sex
N	4621	4621

Standard errors in parentheses

Margins: average margins

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

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Table 9: Heterogenous probit model (C): Probability of dropping out of training

	Model C.1 margins/se	Model C.2 margins/se	Model C.3 margins/se
Secondary Job, money for living	.2058467*** (.0271682)	.2079339*** (.0266601)	.211953*** (.0277692)
Secondary Job, money for extra wishes	-.0003878 (.0225262)	.0056534 (.0233672)	.0047939 (.0224607)
Secondary Job, money for living and wishes	.0534017* (.0216297)	.0623907** (.022135)	.0553792* (.0218681)
Female	.0059591 (.0180753)	-.0071191 (.0167202)	.006709 (.0177731)
Migration	.0383441* (.0190343)	.0353814 (.0189214)	.0371995 (.0193407)
Age: 20-24	-.0099757 (.0154001)	-.0131357 (.0153272)	-.0104019 (.0156614)
Age: 25-30	-.128186*** (.0263933)	-.1324856*** (.0262969)	-.128773*** (.026678)
Region: West Germany	.0132858 (.0163249)	.0216823 (.0161444)	.01499 (.016273)
Grade: German	-.0084292 (.0089779)	-.0111706 (.0089564)	-.0092234 (.0089536)
Grade: Math	.0275721*** (.0070468)	.0298423*** (.007031)	.0287822*** (.0071238)
Income: 400 - 600 Euro	-.0475633** (.0171075)	-.0513679** (.0167378)	-.0494742** (.0171898)
Income: 600 - 1500 Euro	-.128539*** (.0232791)	-.1420579*** (.0235958)	-.12989*** (.0234811)
Interesting Occupation	.0804629*** (.0147342)	.0796401*** (.0151048)	.0813459*** (.0147266)
Alternative Occupation	.1741076*** (.0203522)	.1659233*** (.0204386)	.1726139*** (.0206149)
Compensation	.3354319*** (.0309159)	.324926*** (.0292085)	.3333871*** (.0310807)
Do not know	.327254*** (.0365983)	.3089935*** (.0371228)	.3270456*** (.036881)
Business	.0354368 (.024114)	.0317054 (.0204265)	.0399415 (.0237237)
Service	.1209249*** (.0209181)	.1223404*** (.0199417)	.1298833*** (.0208705)
Choice equation	Model C	Model C	Model C
Variance equation	occupation	migration, sex	occupation, migration, age, sex
N	4621	4621	4621

Standard errors in parentheses

Margins: average margins

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Appendix I

Table 10: Heterogenous probit model (D): Probability of dropping out of training

	Model D.1 margins/se	Model D.2 margins/se	Model D.3 margins/se
Secondary Job, money for living	.1561549*** (.0253498)	.157347*** (.0253023)	.1571557*** (.0256709)
Secondary Job, money for extra wishes	.0139978 (.0217228)	.0161311 (.0223455)	.0153213 (.0216375)
Secondary Job, money for living and wishes	.0337612 (.0201876)	.0400614 (.0206761)	.0338547 (.020325)
Female	.0181792 (.0165437)	.0037228 (.0158661)	.0142938 (.0169717)
Migration	.0384206* (.0177939)	.0364105* (.0179124)	.039697* (.0179917)
Age: 20-24	-.0145907 (.0145347)	-.0136726 (.0144124)	-.0150053 (.0145603)
Age: 25-30	-.1346523*** (.0241522)	-.13588*** (.0245637)	-.1381463*** (.0246711)
Region: West Germany	.003542 (.0152009)	.0108877 (.0151484)	.0038635 (.0151468)
Grade: German	-.0077823 (.0084736)	-.0107411 (.0084783)	-.0082146 (.008486)
Grade: Math	.0177558** (.0066592)	.0195954** (.006679)	.0173953** (.0066789)
Income: 400 - 600 Euro	-.0293521 (.0155727)	-.0316617* (.0155204)	-.0287573 (.0156155)
Income: 600 - 1500 Euro	-.0852638** (.0224339)	-.0988418*** (.023106)	-.0854807** (.0225098)
Interesting Occupation	.0548722*** (.0144609)	.0487375*** (.014755)	.0547351*** (.0145304)
Alternative Occupation	.1156325*** (.019301)	.1050579*** (.0193258)	.1150246*** (.0194071)
Compensation	.2056176*** (.0291376)	.1951417*** (.0281147)	.2068475*** (.0293375)
Do not know	.1920508*** (.0350682)	.1743734*** (.0353811)	.1916696*** (.0350178)
Business	.035236 (.0207546)	.0300915 (.0191235)	.0371393 (.0207578)
Service	.1119531*** (.0193607)	.1141089*** (.0188639)	.1162012*** (.0198628)
Grade for VET	.1590827*** (.006099)	.1590246*** (.0061192)	.1591919*** (.0061186)
Choice equation	Model D	Model D	Model D
Variance equation	occupation	migration, sex	occupation, migration,
N	4621	4621	4621

Standard errors in parentheses

Margins: average margins

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$