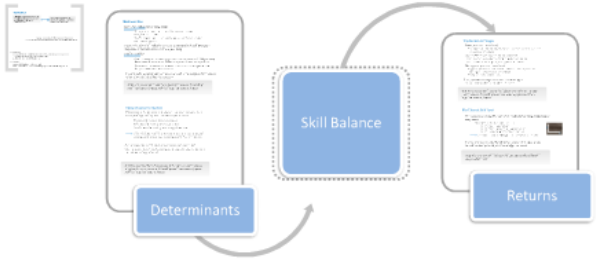
Presentation at TASKS | January 17, 2011

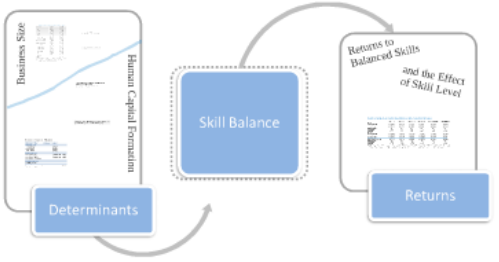
The Skill Balancing Act: Determinants of and Returns to Balanced Skills

Elisabeth Bublitz & Florian Noseleit
Friedrich Schiller University Jena University of Groningen
Collaborative Research Center (SFB 580)

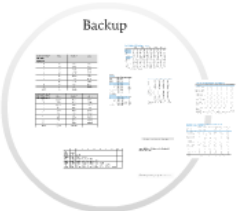


THEORY

RESULTS



Backup



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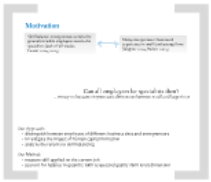

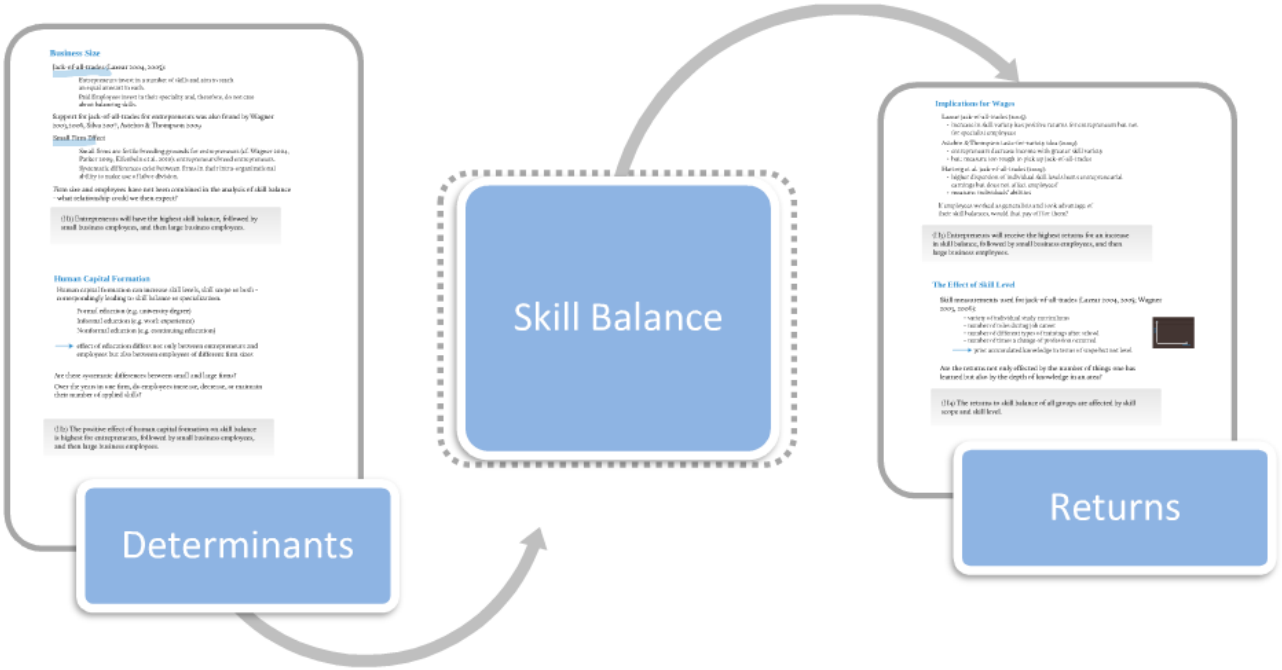

THEORY

Motivation

Skill Balance: entrepreneurs tend to be generalists while employees tend to be specialists (jack-of-all-trades, Lazear 2004, 2005)

Many entrepreneurs have work experience in small (and young) firms (Wagner 2004, Parker 2009)

Can all employees be specialists then?

... we say no because of systematic differences between small and large firms

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Our Approach:

- distinguish between employees of different business sizes and entrepreneurs
- investigate the impact of human capital formation
- analyze the returns to skill balancing

Our Method:

- measure skill applied on the current job
- account for balance in quantity (skill scope) and quality (skill level) dimension

Business Size

Jack-of-all-trades (Lazear 2004, 2005):

Entrepreneurs invest in a number of skills and aim to reach an equal amount in each.

Paid Employees invest in their speciality and, therefore, do not care about balancing skills.

Support for jack-of-all-trades for entrepreneurs was also found by Wagner 2003,2006, Silva 2007, Astebro & Thompson 2009

Small Firm Effect

Small firms are fertile breeding grounds for entrepreneurs (cf. Wagner 2004, Parker 2009, Elfenbein et al. 2010): entrepreneurs breed entrepreneurs.

Systematic differences exist between firms in their intra-organizational ability to make use of labor division.

Firm size and employees have not been combined in the analysis of skill balance - what relationship could we then expect?

(H1) Entrepreneurs will have the highest skill balance, followed by small business employees, and then large business employees.

Human Capital Formation

Human capital formation can increase skill levels, skill scope or both - correspondingly leading to skill balance or specialization.

Formal eduction (e.g. university degree)
Informal eduction (e.g. work experience)
Nonformal eduction (e.g. continuing education)

→ effect of education differs not only between entrepreneurs and employees but also between employees of different firm sizes

Are there systematic differences between small and large firms?

Over the years in one firm, do employees increase, decrease, or maintain their number of applied skills?

(H2) The positive effect of human capital formation on skill balance is highest for entrepreneurs, followed by small business employees, and then large business employees.

Determinants

Skill Balance

Implications for Wages

Lazear jack-of-all-trades (2005):
- increase in skill variety has positive returns for entrepreneurs but not for specialist employees

Astebro & Thompson taste-for-variety idea (2009):
- entrepreneurs decrease income with greater skill variety
- but: measure too rough to pick up jack-of-all-trades

Hartorg et al. jack-of-all-trades (2009):
- higher dispersion of individual skill levels hurts entrepreneurial earnings but does not affect employees'
- measure: individuals' abilities

If employees worked as generalists and took advantage of their skill balances, would that pay off for them?

(H3) Entrepreneurs will receive the highest returns for an increase in skill balance, followed by small business employees, and then large business employees.

The Effect of Skill Level

Skill measurements used for jack-of-all-trades (Lazear 2004, 2005; Wagner 2003, 2006):
- variety of individual study curriculums
- number of roles during job career
- number of different types of trainings after school
- number of times a change of profession occurred

→ prior accumulated knowledge in terms of scope but not level

Are the returns not only effected by the number of things one has learned but also by the depth of knowledge in an area?

(H4) The returns to skill balance of all groups are affected by skill scope and skill level.

Returns

THEORY

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height
quantity
3341

large business employees.

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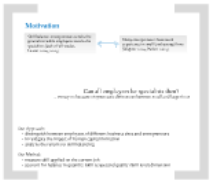

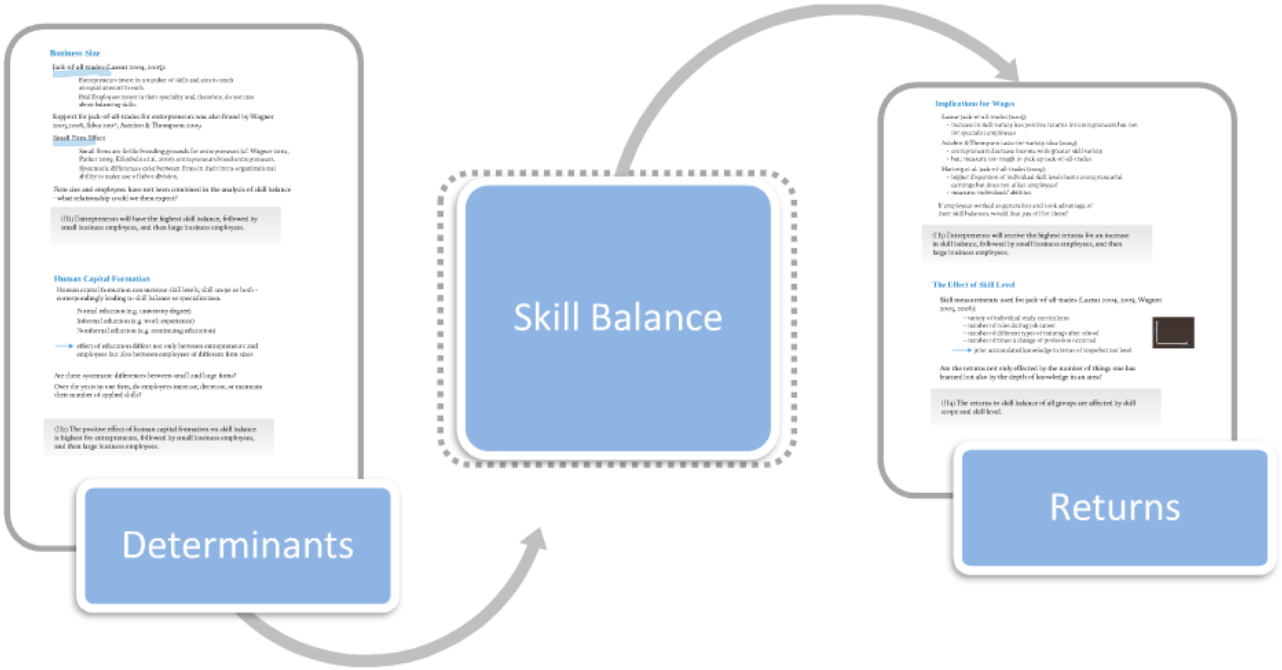

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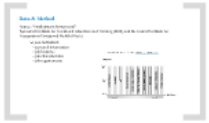
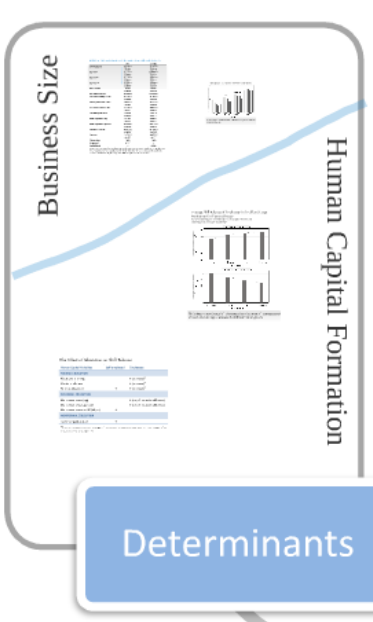
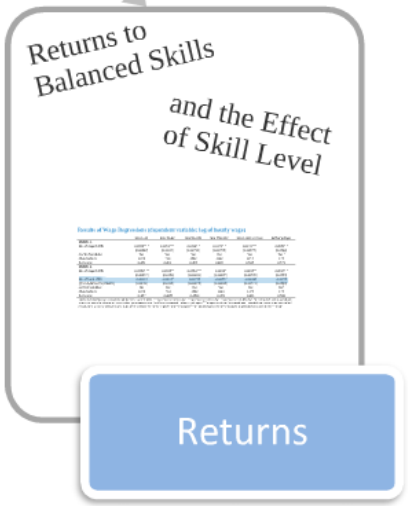
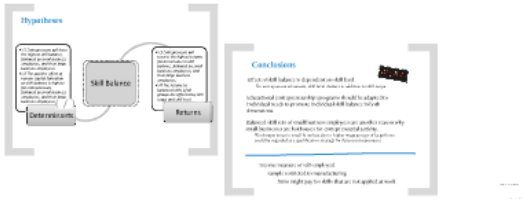








FRIEDRICH SCHILLER UNIVERSITY JENA
CHAIR OF BUSINESS DYNAMICS, INNOVATION, AND ECONOMIC CHANGE
Lehrstuhl für Unternehmensentwicklung, Innovation und wirtschaftlichen Wandel

SFB 580
Gesellschaftliche Entwicklungen nach dem Systemumbruch
Diskontinuität
Tradition
Strukturbildung

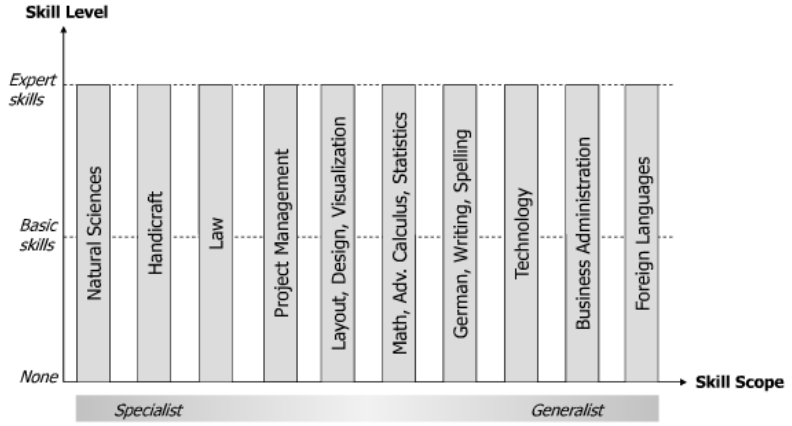
Data & Method

Source: "Employment Survey 2006"
by Federal Institute for Vocational Education and Training (BIBB) and the Federal Institute for Occupational Safety and Health (BAuA)

20,000 individuals

- personal information
- job histories
- job characteristics
- job requirements

New Indicator for Skill Balance: Count of all Expert Skills



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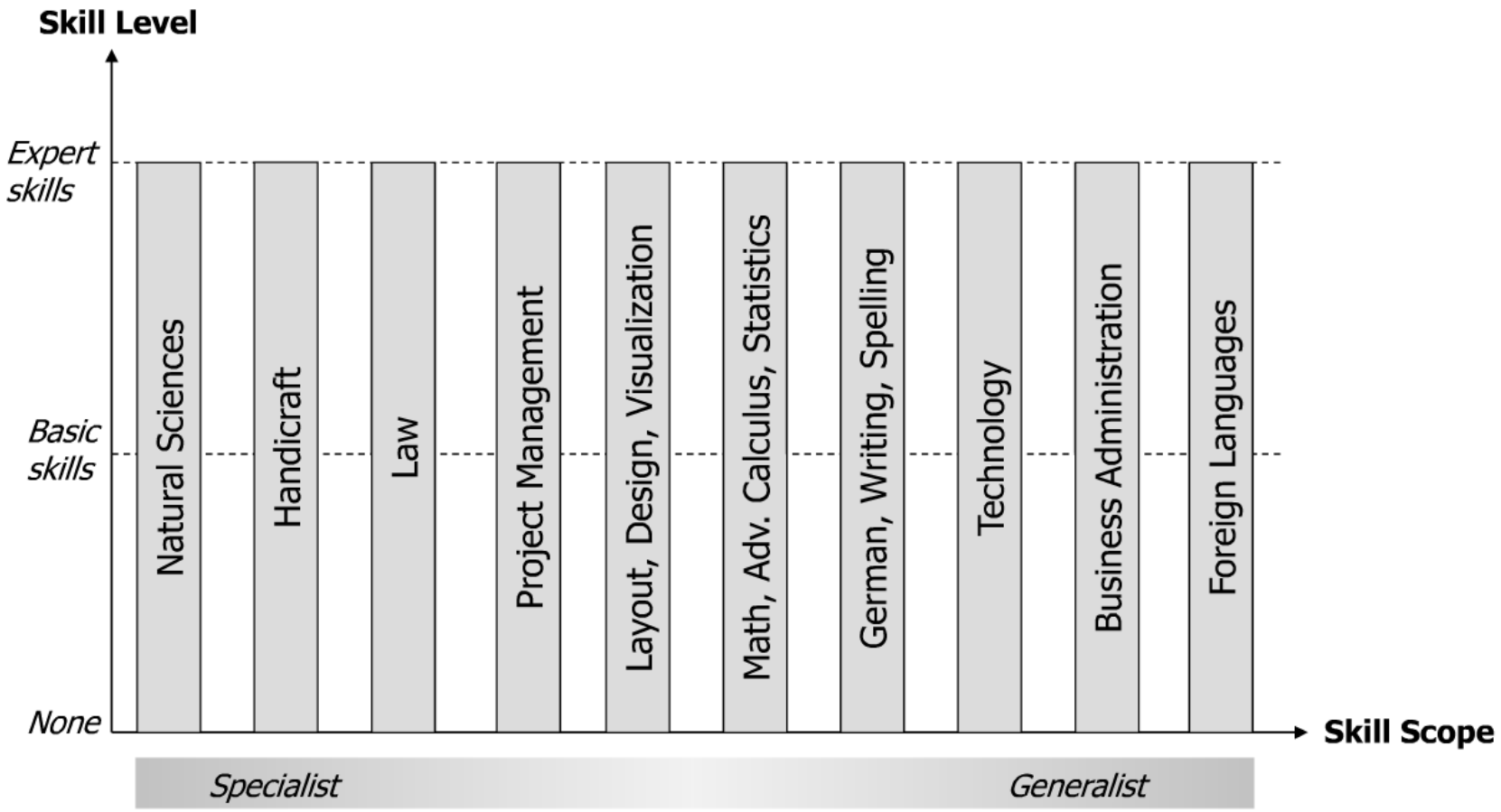
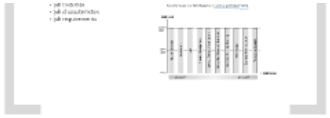
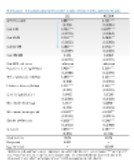
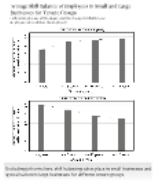




Business Size

Human Capital Formation

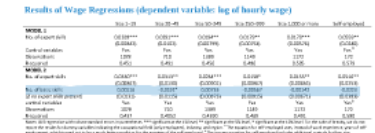




Determinants

Skill Balance

Returns to Balanced Skills and the Effect of Skill Level



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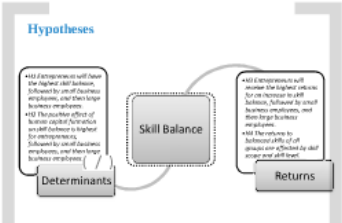
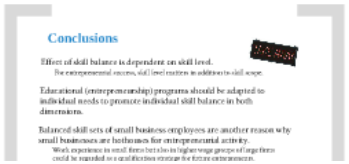
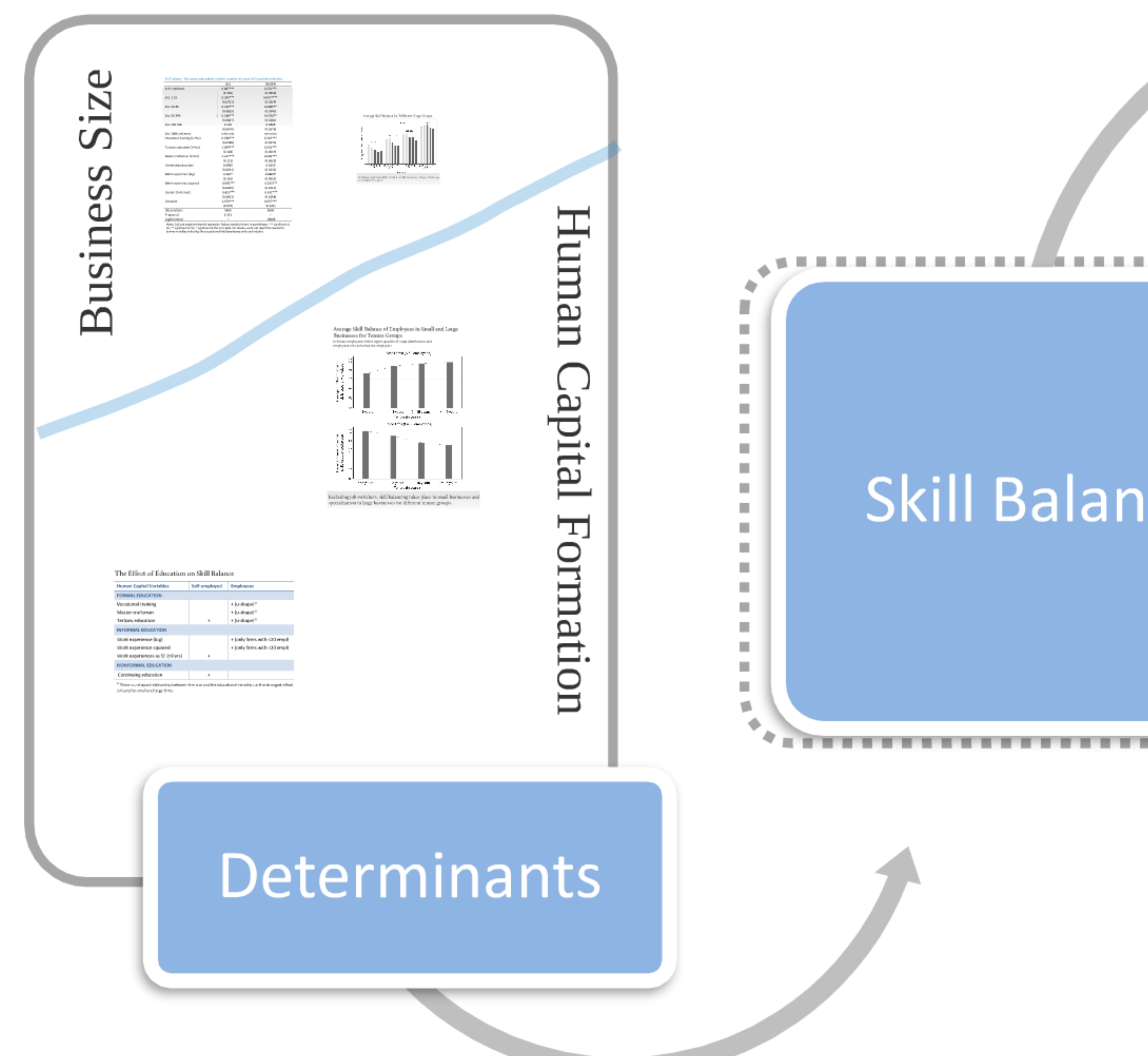
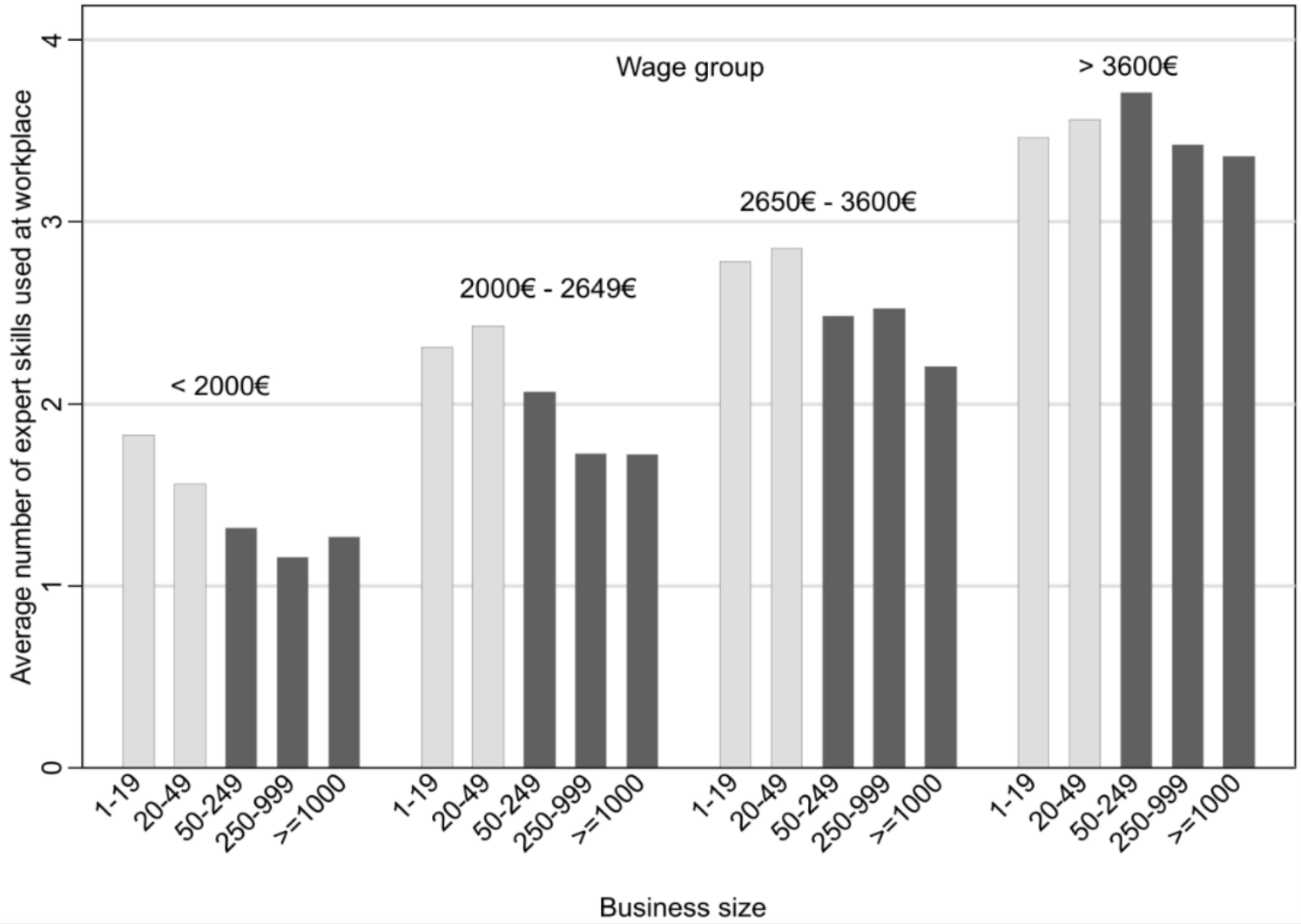





Business Size
Human Capital Formation
The Effect of Education on Skill Balance
Human Capital Variables
Self employed
Employees
FORMAL EDUCATION
Vocational training
Master craftsman
Tertiary education
INFORMAL EDUCATION
NONFORMAL EDUCATION
Continuing education
Average Skill Balance of Employees in Small and Large Businesses for Tenure Groups
Excluding job switchers, skill balancing takes place in small businesses and specialization in large businesses for different tenure groups.
Determinants
Skill Balan

Average Skill Balance for Different Wage Groups



Employees apply more skills at work in smaller businesses, as long as their wage is not higher than 3600€.

Skill balance - full sample (dependent variable: number of expert skills applied on the job)

	OLS	NEGBIN
Self-employed	0.847***	0.251***
	(0.160)	(0.0450)
Size 1-19	0.243***	0.0977***
	(0.0761)	(0.0314)
Size 20-49	0.224***	0.0845**
	(0.0825)	(0.0343)
Size 50-249	0.188***	0.0700**
	(0.0687)	(0.0281)
Size 249-999	0.110	0.0404
	(0.0676)	(0.0276)
Size 1000 and more	reference	reference
Vocational training (1=Yes)	0.438***	0.319***
	(0.0788)	(0.0579)
Tertiary education (1=Yes)	1.094***	0.552***
	(0.108)	(0.0619)
Master craftsman (1=Yes)	1.227***	0.605***
	(0.112)	(0.0625)
Continuing education	0.0466	0.0239
	(0.0591)	(0.0233)
Work experience (log)	0.216*	0.0864*
	(0.126)	(0.0523)
Work experience squared	-0.0567**	-0.0237**
	(0.0266)	(0.0111)
Gender (1=Female)	-0.813***	-0.391***
	(0.0601)	(0.0298)
Constant	2.474***	0.697***
	(0.476)	(0.223)
Observations	5669	5669
R-squared	0.322	–
Loglikelihood	–	-10064

Notes: OLS and negative binomial regression. Robust standard errors in parentheses. *** significant at 1%, ** significant at 5%, * significant at the 10 % level. For brevity we do not report the results for dummy variables indicating the occupational field (employees only) and industry.

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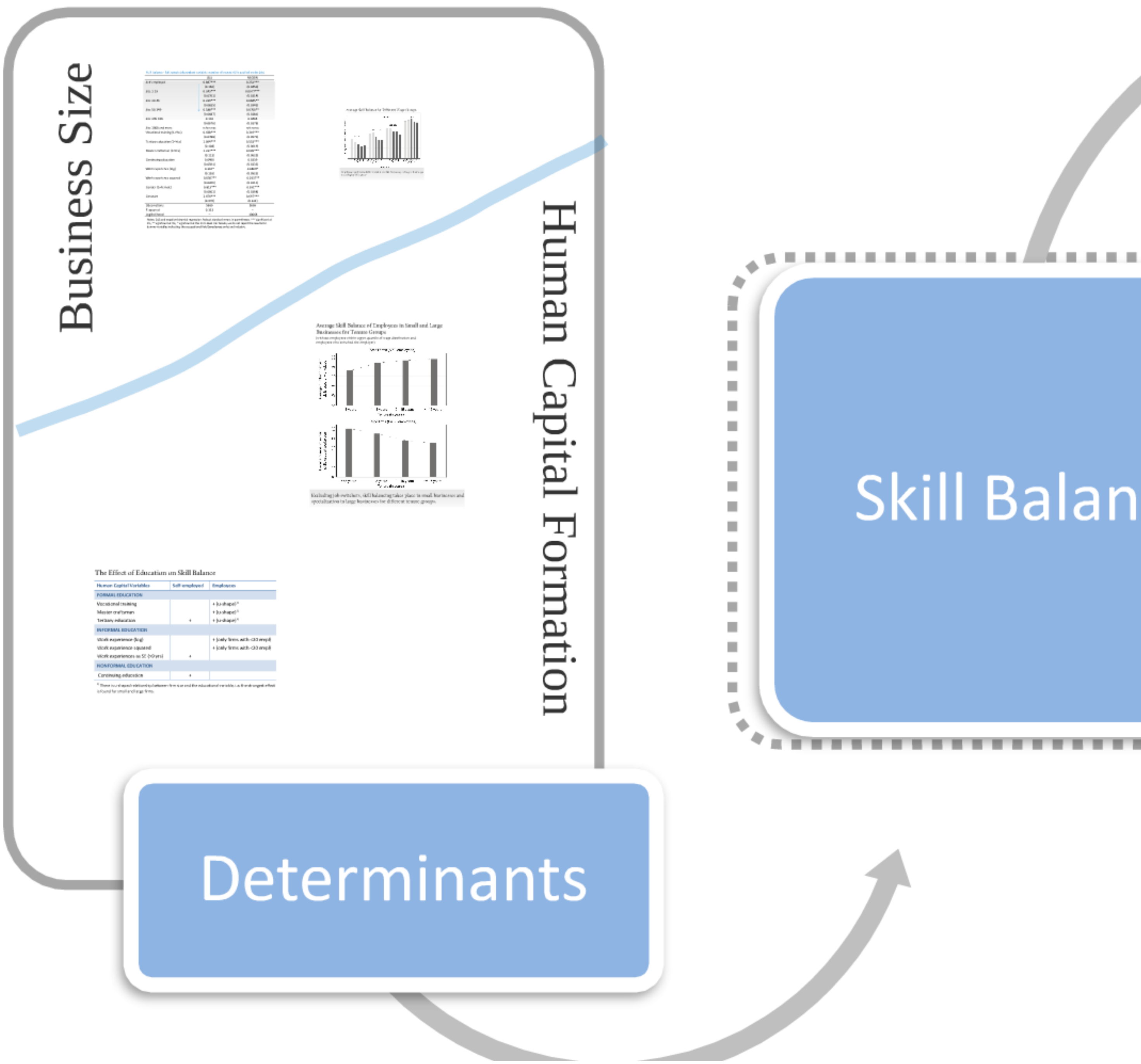
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The Effect of Education on Skill Balance

Human Capital Variables	Self-employed	Employees
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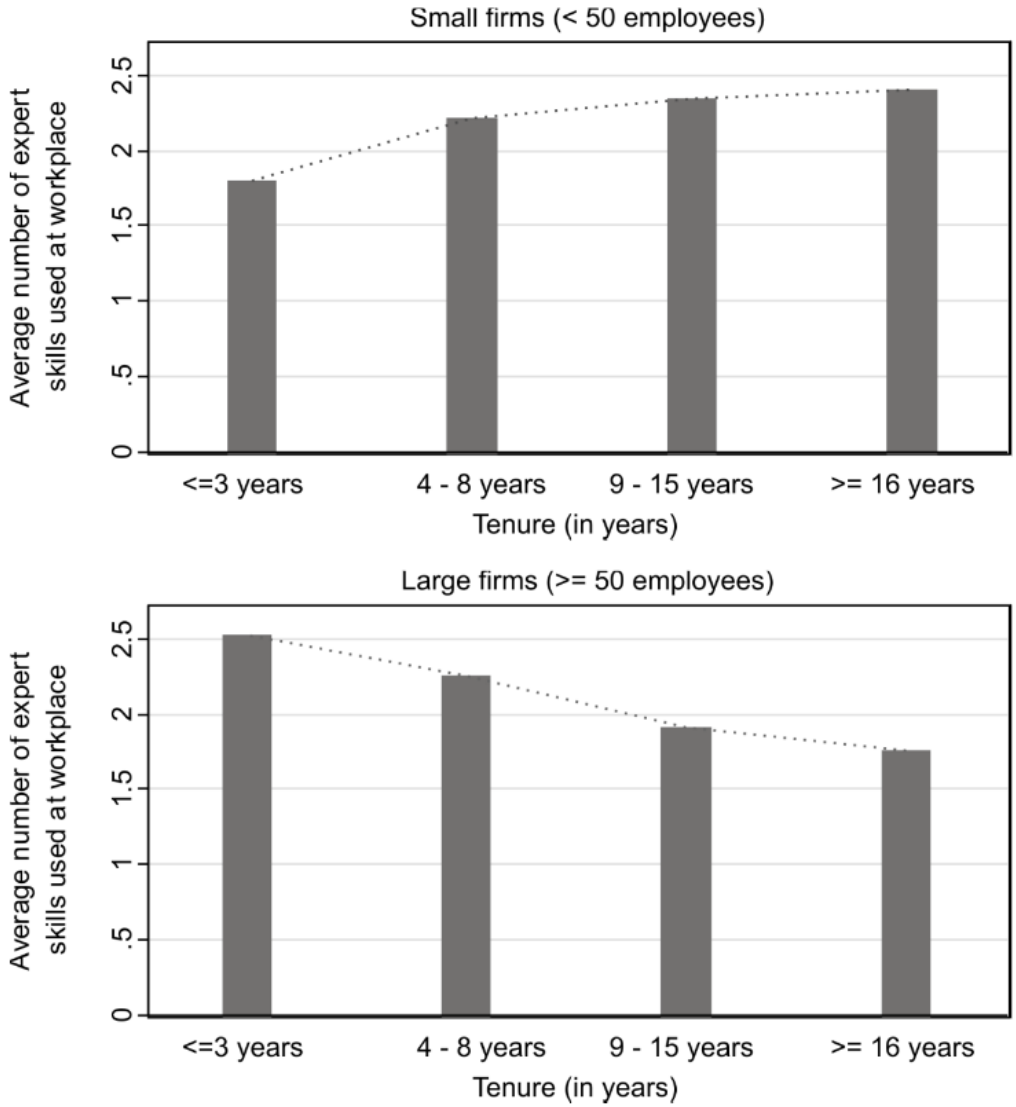
Vocational training		+ (u-shape) [1)]
Master craftsman		+ (u-shape) [1)]
Tertiary education	+	+ (u-shape) [1)]
INFORMAL EDUCATION		
Work experience (log)		+ (only firms with <20 empl)
Work experience squared		+ (only firms with <20 empl)
Work experiences as SE (>9 yrs)	+	
NONFORMAL EDUCATION		
Continuing education	+	

[1)] There is u-shaped relationship between firm size and the educational variable, i.e. the strongest effect is found for small and large firms.

Average Skill Balance of Employees in Small and Large Businesses for Tenure Groups

(without employees within upper quartile of wage distribution and employees who switched the employer)



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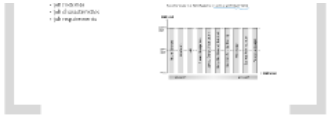

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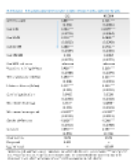

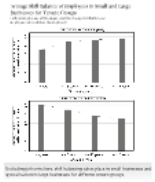

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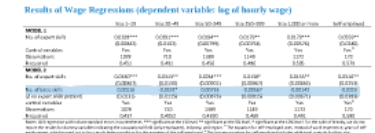
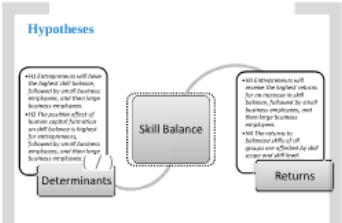
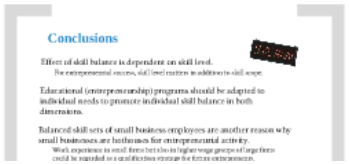


Returns





ill Balance

Returns to
Balanced Skills

and the Effect
of Skill Level

Results of Wage Regressions (dependent variable: log of hourly wage)

	Size 1–19	Size 20–49	Size 50–249	Size 250–999	Size 1,000 or more	Self-employed
MODEL 1						
No. of expert skills	0.0328***	0.0291***	0.0194**	0.0179**	0.0170***	0.0336**
	(0.00842)	(0.0102)	(0.00798)	(0.00753)	(0.00576)	(0.0244)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes[a]
Observations	1078	716	1189	1148	1172	172
R-squared	0.451	0.445	0.476	0.486	0.505	0.579
MODEL 2						
No. of expert skills	0.0330***	0.0332**	0.0234***	0.0158*	0.0155**	0.0516**
	(0.00847)	(0.0130)	(0.00901)	(0.00867)	(0.00636)	(0.0255)
No. of basic skills	0.00156	-0.0182*	0.00733	0.00547	-0.00512	-0.0223
(if no expert skills present)	(0.0131)	(0.0115)	(0.00755)	(0.00515)	(0.00671)	(0.0305)
control variables	Yes	Yes	Yes	Yes	Yes	Yes[a]
Observations	1078	716	1189	1148	1172	172
R-squared	0.447	0.4452	0.4789	0.488	0.505	0.580

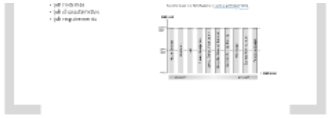
Notes: OLS regression with robust standard errors in parentheses. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. For the sake of brevity, we do not report the results for dummy variables indicating the occupational field (unemployment, industry, and region. [a] The equation for self-employed includes, instead of work experience, years of self-employment', which turned out to be a much better predictor for the earnings of the self-employed. [b] The income equation for self-employed includes additional controls for firm size.

Returns

Results of Wage Regressions (dependent variable: log of hourly wage)

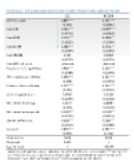
	Size 1–19	Size 20–49	Size 50–249	Size 250–999	Size 1,000 or more	Self-employed
MODEL 1						
No. of expert skills	0.0328***	0.0291***	0.0194**	0.0179**	0.0170***	0.0559**
	(0.00842)	(0.0102)	(0.00799)	(0.00753)	(0.00576)	(0.0240)
Control variables	Yes	Yes	Yes	Yes	Yes	Yes [B]
Observations	1078	710	1389	1149	1172	172
R-squared	0.451	0.491	0.456	0.486	0.505	0.579
MODEL 2						
No. of expert skills	0.0330***	0.0313**	0.0234***	0.0158*	0.0155**	0.0516**
	(0.00867)	(0.0130)	(0.00901)	(0.00867)	(0.00636)	(0.0253)
No. of basic skills	0.00116	-0.0192*	0.00733	-0.00567	-0.00142	-0.0223
(if no expert skills present)	(0.0131)	(0.0115)	(0.00873)	(0.00815)	(0.00671)	(0.0383)
control variables	Yes	Yes	Yes	Yes	Yes	Yes[B]
Observations	1078	710	1389	1149	1172	172
R-squared	0.437	0.4052	0.4390	0.469	0.491	0.580

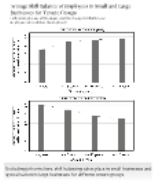
Notes: OLS regression with robust standard errors in parentheses. *** significant at the 1% level, ** significant at the 5% level, * significant at the 10% level. For the sake of brevity, we do not report the results for dummy variables indicating the occupational field (only employees), industry, and region. [A] The equation for self-employed uses, instead of work experience, years of self-employment, which turned out to be a much better predictor for the earnings of the self-employed. [B] The income equation for self-employed includes additional controls for firm size.



Business Size

Human Capital Formation

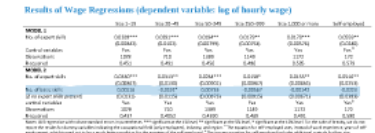




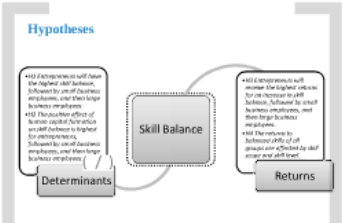
Determinants

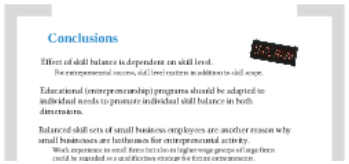
Skill Balance

Returns to Balanced Skills and the Effect of Skill Level

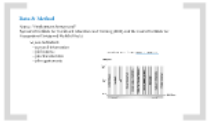


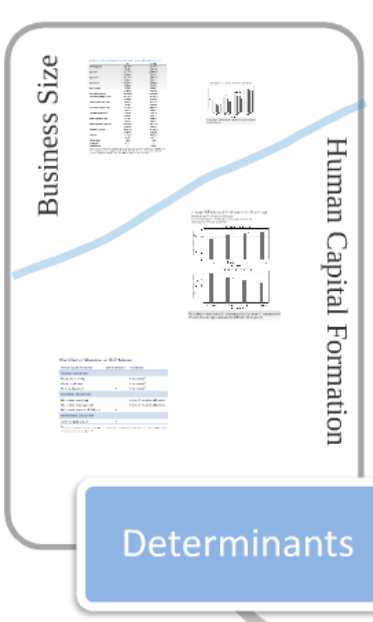
Returns

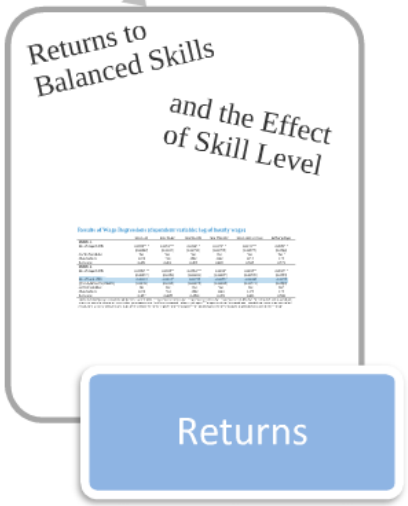


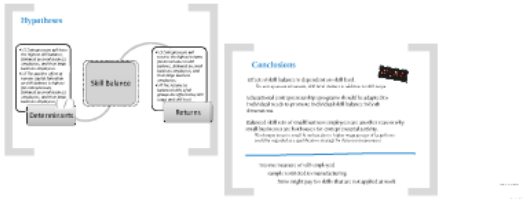


RESULTS





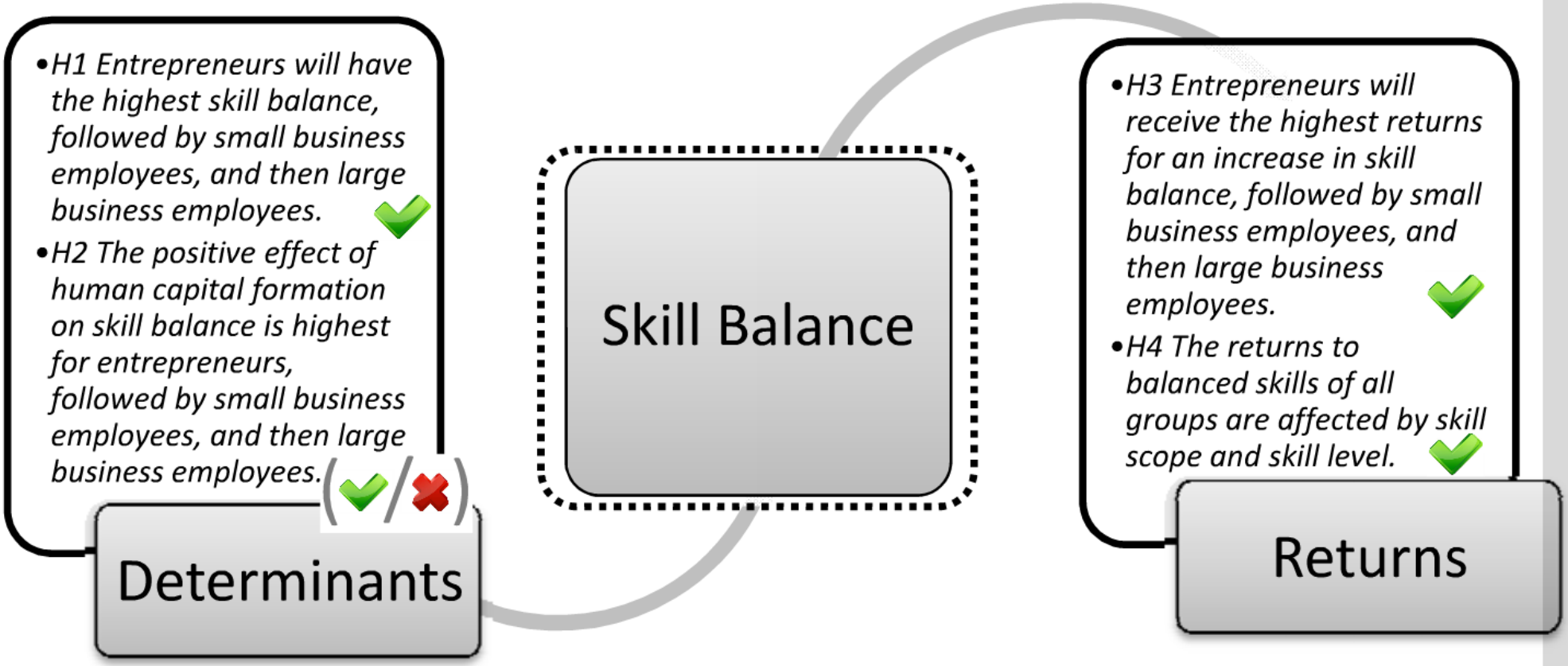




FRIEDRICH SCHILLER UNIVERSITY JENA
CHAIR OF BUSINESS DYNAMICS, INNOVATION, AND ECONOMIC CHANGE
Lehrstuhl für Unternehmensentwicklung, Innovation und wirtschaftlichen Wandel

SFB 580
Gesellschaftliche Entwicklungen nach dem Systemumbruch
Diskontinuität
Tradition
Strukturbildung

Hypotheses


•H1 Entrepreneurs will have the highest skill balance, followed by small business employees, and then large business employees.
•H2 The positive effect of human capital formation on skill balance is highest for entrepreneurs, followed by small business employees, and then large business employees.
Determinants
Skill Balance
•H3 Entrepreneurs will receive the highest returns for an increase in skill balance, followed by small business employees, and then large business employees.
•H4 The returns to balanced skills of all groups are affected by skill scope and skill level.
Returns

Conclusions

Effect of skill balance is dependent on skill level.

For entrepreneurial success, skill level matters in addition to skill scope.

Educational (entrepreneurship) programs should be adapted to individual needs to promote individual skill balance in both dimensions.

Balanced skill sets of small business employees are another reason why small businesses are hothouses for entrepreneurial activity.

Work experience in small firms but also in higher wage groups of large firms could be regarded as a qualification strategy for future entrepreneurs.

Conclusions

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income measure of self-employed

sample restricted to manufacturing

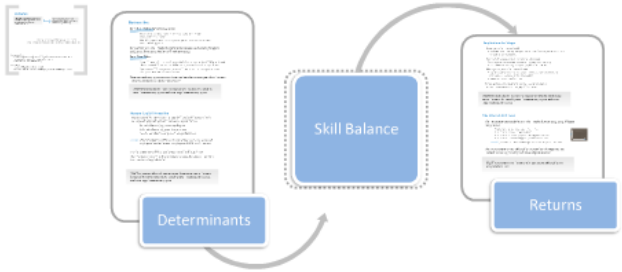
firms might pay for skills that are not applied at work

Thank you for your attention!

Presentation at TASKS | January 17, 2011

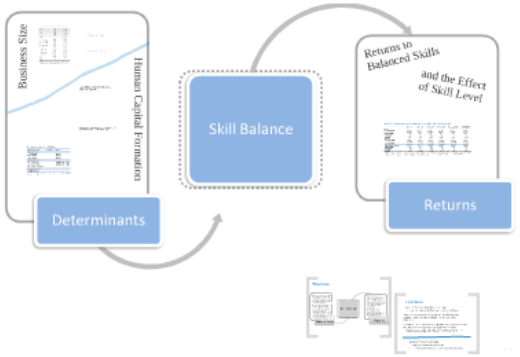
The Skill Balancing Act: Determinants of and Returns to Balanced Skills

Elisabeth Bublitz & Florian Noseleit
Friedrich Schiller University Jena University of Groningen
Collaborative Research Center (SFB 580)



THEORY

RESULTS



Backup