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Mario Situm
University of Applied Sciences Kufstein

Stefan Märk
University of Applied Sciences Salzburg

Measuring the degree of internationalisation based on entrepreneurial value chain activities:

An analysis for micro and small enterprises in West Austria

Structure of the presentation

- Problem statement, relevance & aim of the study
- Theoretical framework & research questions
- Research design & data
- Variables of the study
- Results
  - Descriptive statistics
  - Logit regression analyses
- Summary and discussion of the results

Problem statement, relevance & aim of the study

- Internationalization is an important step for SMEs to ensure **survival** and **long-term growth** (Cerrato Piva, 2012; Lu & Beamish, 2004) / in the field of research on the internationalization of family businesses, there are still sufficient unresolved issues (Bose, 2016; Pukall & Calabro, 2014)

- Nevertheless, many companies do not dare to take this step because it is one of the **most risky strategic decisions** for SMEs (Chaston, 2010, 37)

- The term internationalization can have different meanings and therefore there is **no uniform definition** of it in the literature (Thompson & Martin, 2010) / internationalization process is a **complex** and **latent** unobservable construct (Olejnik & Swoboda, 2012)

- There are **various ways** to measure internationalization (e.g. foreign/total sales [Acedo & Florin, 2006; Graves & Shan, 2014], foreign assets/total assets [Kaczmarek & Ruigrok, 2013; Kamakura et al., 2012], entropy index of internationalization [Cerrato & Piva, 2012; Hitt et al., 1997] etc.).

- **None** of the previous studies have analyzed the **degree of internationalization** of **individual value chain activities**

Theoretical framework & research questions

- **Resource-based view** (RBV) is a powerful theoretical perspective to explain the internationalization activities of companies (Peng, 2001)

- Relevant **proxies** in context with RBV are the **size** and the **age of the firm** (Cerrato & Piva, 2012; Esteve-Pérez & Manez-Castillejo, 2008; Jovanovic, 1982; Jovanovic & MacDonald, 1994) / Proxies measuring family-resources and experiences are the **age of the management** (Arbaugh et al., 2008; Eriksson et al., 2000) or the **generation of the firm** (Davis, 2008) etc.

- Research questions:
  - How does the **degree of internationalization** in individual value chain activities **differ** between **exporting** and **non-exporting** micro and small enterprises?

  - What influence does the **degree of internationalization** of individual activities in the value chain have on the **exporting** and **non-exporting status** of micro and small enterprises?

Research design and data (1/3)

- more than 36,000 companies in western Austria (Tyrol, Salzburg and Vorarlberg) were contacted with a **questionnaire**, which had been developed based on a literature review to guarantee content validity and measurement accuracy (DePoy & Gitlin 2011, 204; Greenstein & Davis 2013, 67)

- A total of 1,054 completed questionnaires were returned, which had to be reduced due to missing data (Jamshidian, 2009, 116) and additionally only family businesses defined by the F-PEC power subscale (Astrachan et al., 2002; Astrachan et al., 2006, 173-174) (a.) the majority of decision-making rights are held by the family, b.) the majority of decision-making rights are held directly or indirectly, and/or c.) at least one representative of the family holds the management of the company) (Sharma, 2006) had been selected

- The classification of enterprises by size was made in accordance with the recognized **criteria** of the **European Commission** for the definition of micro and small enterprises. In the classification by industry the classification criterion of **ÖNACE2008** was used.

- After reduction, **461 completed questionnaires** remained, which were evaluated for the following analyses (326 micro and 135 small enterprises)

- To test the research hypotheses **logistic regression** was applied. This method is suitable for the problem of the work, since the dependent variable was binary coded and thus also probabilities for one of the two states can be calculated (Burns & Burns 2008, 568-569; Marques de Sá 2007, 271)

Research design and data (2/3)

Table 1. Sample description: Company age, industry relation and export orientation

The industry classes were based on the Austrian NACE 2008 codes and contain: A = Agriculture, forestry and fishing, B = Mining and quarrying, C = Manufacturing, D = Electricity, gas, steam and air condition supply, E = water supply, sewerage, waste management and remediation activities, F = Construction, G = Wholesale and retail trade and repair of motor vehicles and motorcycles , H = Transporting and storage, I = Accommodation and food service activities , J = Information and communication, K= Financial and insurance activities, L = Real estate activities, M = Professional, scientific and technical activities, N = Administrative and support service activities, Q = Human health and social work activities, R = Arts, entertainment and recreation, S = Other services activities, T = Creation of goods and provision of services for personal consumption. Branches A and B and D and E were combined due to the low numbers in some cases. Additionally, descriptive statistics about the age of the firms in year were highlighted using mean, median and standard deviation (**σ**). In order to capture, whether the firms are mainly engaged in regional (REG) or international (INT) relations the dummy variable EXP was evaluated (in accordance with Benito-Hernandez et al. (2014)).

	Micro firms						Small firms						All firms					
		AGE			EXP			AGE			EXP			AGE			EXP	
Industry	n	Mean	Median	σ	REG	INT	n	Mean	Median	σ	REG	INT	n	Mean	Median	σ	REG	INT
A, B	6	47.500	16.000	63.623	6	0	0	-	-	-	0	0	6	47.500	16.000	63.623	6	0
C	40	46.075	37.000	34.047	24	16	21	37.810	37.000	22.827	11	10	61	43.230	37.000	30.706	35	26
D, E	4	32.750	14.500	42.374	4	0	0	-	-	-	0	0	4	32.750	14.500	42.374	4	0
F	26	29.577	23.000	21.298	22	4	16	51.375	42.500	34.300	13	3	42	37.881	28.500	28.667	35	7
G	18	27.667	16.500	23.966	12	6	12	78.000	46.000	124.943	7	5	30	47.800	26.500	82.988	19	11
H	5	31.800	24.000	23.732	5	0	8	35.875	18.000	31.348	3	5	13	34.308	18.000	27.663	8	5
I	65	30.677	27.000	21.165	20	45	42	56.595	41.500	86.775	14	28	107	40.850	29.000	57.833	34	73
J	36	19.250	15.000	9.391	27	9	7	28.857	19.000	27.021	2	5	43	20.814	17.000	13.809	29	14
K	9	21.111	15.000	17.517	7	2	0	-	-	-	0	0	9	21.111	15.000	17.517	7	2
L	6	41.000	30.000	32.711	6	0	3	32.333	30.000	6.807	2	1	9	38.111	30.000	26.441	8	1
M	30	22.833	17.000	19.348	20	10	8	27.125	25.000	11.269	6	2	38	23.737	17.000	17.905	26	12
N	14	22.071	16.000	18.164	9	5	5	31.200	27.000	17.754	3	2	19	24.474	16.000	18.038	12	7
Q	2	15.500	15.500	0.707	1	1	0	-	-	-	0	0	2	15.500	15.500	0.707	1	1
R	24	20.125	21.500	9.162	20	4	2	28.500	28.500	16.263	2	0	26	20.769	21.500	9.643	22	4
S	5	30.200	29.000	10.941	4	1	1	-	-	-	1	0	6	27.167	26.500	12.287	5	1
T	30	21.033	16.000	17.315	21	9	9	28.444	28.000	15.224	5	4	39	22.744	19.000	16.959	26	13
U	6	27.333	27.500	15.501	4	2	1	-	-	-	0	1	7	31.571	29.000	18.054	4	3
Total	**326**	**28.411**	**21.000**	**23.921**	**212**	**114**	**135**	**46.444**	**37.000**	**64.358**	**69**	**66**	**461**	**33.692**	**24.000**	**40.968**	**281**	**180**

Research design and data (3/3)

Table 2. Sample description: Respondent age, gender, generation and education

The table shows the summary about the demographics of the respondents of the questionnaire, who were recognized as the entrepreneurs. The respondents were categorized into the different generations for micro and small firms. Additionally, they were differentiated in male and female. For the age and the years of working experiences the means are reported, which seems appropriate as the data were normally distributed (not reported here in details). For the highest education the different possibilities and their answer frequencies are displayed (COMP = Compulsory school; APPR = Apprenticeship; ALEV = A-levels; MAST = Master´s examination; UNIV = University degree; SEC = Secondary school; OTHER = Other education).

		Male										**Female**									
					Education										Education						
	GEN	n	AGE	EXP	COMP	APPR	ALEV	MAST	UNIV	SEC	OTHER	n	AGE	EXP	COMP	APPR	ALEV	MAST	UNIV	SEC	OTHER
Micro firms	1.	150	52.787	32.307	3	22	24	37	47	11	6	56	51.964	30.393	2	4	7	2	30	10	1
	2.	51	51.706	32.451	1	3	5	19	11	9	3	23	48.043	29.522	0	4	3	4	8	3	1
	3.	24	51.167	32.000	0	3	5	7	7	2	0	5	45.400	24.800	0	1	1	1	1	1	0
	4.	5	52.600	34.000	0	2	0	1	1	1	0	4	51.750	28.500	0	0	3	0	1	0	0
	5.	6	45.667	28.500	0	0	1	4	1	0	0	2	43.500	21.500	0	0	0	0	0	2	0
	Total	**236**	**52.20**	**32.25**	**4**	**30**	**35**	**68**	**67**	**23**	**9**	**90**	**50.40**	**29.58**	**2**	**9**	**14**	**7**	**40**	**16**	**2**
Small firms	1.	35	47.457	27.400	0	5	8	11	10	1	0	7	53.286	35.286	0	4	2	0	1	0	0
	2.	38	49.421	29.579	0	5	12	10	9	2	0	8	47.750	26.875	0	0	2	3	3	0	0
	3.	25	50.720	31.240	0	2	3	8	7	4	1	5	43.000	19.600	0	0	1	1	3	0	0
	4.	4	51.000	32.000	0	0	2	0	2	0	0	6	48.333	28.833	0	1	0	1	3	1	0
	5.	5	52.000	32.400	1	0	0	2	1	1	0	2	34.500	17.500	0	0	0	0	1	0	1
	Total	**107**	**49.26**	**29.48**	**1**	**12**	**25**	**31**	**29**	**8**	**1**	**28**	**47.46**	**27.43**	**0**	**5**	**5**	**5**	**11**	**1**	**1**
	Total	**343**	**51.29**	**31.38**	**5**	**42**	**60**	**99**	**96**	**31**	**10**	**118**	**49.70**	**29.07**	**2**	**14**	**19**	**12**	**51**	**17**	**3**

Variables of the study

Table 3. Contextual variables of the family business

The table is grounded / structured based on the context factors described by Davis (2008) [a.) contextual factors of the firm and b.) contextual factors of the management & company culture] and the contingency export-entrepreneurial framework by Ibeh (2003) and Kohli & Jaworski (1990) [a.) firm-specific characteristics and b.) individual decision maker characteristics]. The table contains the variable code, the description of the variable, the computation and related references.

Context factors (Davis, 2008)							
Context factors of the firm				Context factors of the management & company culture			
Code	**Description**	**Computation**	**References**	**Variable**	**Description**	**Computation**	**References**
SIZE	Size of the firm	Log(Number of employees)	Akerman (2015); Benito-Hernàndez et al. (2014); Cerrato & Piva (2012); Fernàndez & Nieto (2005)	AGE_MGMT	Age of the management	Log(Age of the management in years)	Denicolai et al. (2015); Manolova et al. (2002); Ucbasaran et al. (2010)
AGE	Age of the firm	Log(Age of the firm in years)		EXP_MGMT	Experience of the management	Log(Experience of the management in years)	Kyvik et al. (2013); Manolova et al. (2002)
IND	Industry classification	19 Dummy variables (1 = Belonging to the relevant industry; 0 = otherwise)	Almodòvar et al. (2016); Becchetti & Santoro (2011); Situm (2019)	GENDER	Gender of the management	Dummy variable (1 = male; 0 = female)	Manolova et al. (2002); Ucbasaran et al. (2010)
LEGAL_FORM	Legal form	Dummy variable (1= corporation; 0 = otherwise)	Harhoff et al. (1998)	EDUCATION	Education of the management	7 Dummy variables for various educations (1 = highest education; 0 = otherwise)	Denicolai et al. (2015); Manolova et al. (2002); Kyvik et al. (2013); Voordeckers et al. (2007)
VC_ACT	Value chain activities	Estimation between 0 – 100 percent for 11 value chain activities	-	GENERATION	Generation of the firm	Ordinale scale (from 1 = 1st generation to 5 = 5th generation)	Denicolai et al. (2015); Fernàndez & Nieto (2005); Mitter et al. (2014)
Firm-specific characteristics				Individual decision maker characteristics			
Contingency export-entrepreneurial framework (Ibeh, 2003; Kohli & Jaworski, 1990)							

Results

Descriptive statistics

Table 5. Descriptive statistics

The groups were divided in non-exporters (0) and exporters (1). For each of the variables the mean, median and standard deviation (σ) for each group had been computed. Beside of this the significance of the test for normality of data based on Kolmogorov-Smirnov is shown. Additionally, the significances from t-test and U-tests are visible. Significance: *) 10 percent level; **) 5 percent level; ***) 1 percent level. (n = 461)

Variable	Group	Mean	Median	σ	Sign. (KS-Test)	Sign. (t-test)	Sign. (U-Test)
AGE_FIRM	0	1.385	1.362	0.348	0.075*	0.865	0.924
	1	1.379	1.380	0.336	0.054*		
SIZE_FIRM	0	0.600	0.602	0.457	0.000***	0.111	0.093
	1	0.671	0.699	0.480	0.000***		
VC_INBOUND	0	0.102	0.000	0.225	0.000***	0.000***	0.000***
	1	0.199	0.015	0.301	0.000***		
VC_PROD	0	0.081	0.000	0.229	0.000***	0.000***	0.000***
	1	0.170	0.000	0.308	0.000***		
VC_OUTBND	0	0.034	0.000	0.118	0.000***	0.000***	0.000***
	1	0.167	0.000	0.282	0.000***		
VC_MARKET	0	0.071	0.000	0.191	0.000***	0.000***	0.000***
	1	0.354	0.255	0.361	0.000***		
VC_SALES	0	0.074	0.000	0.179	0.000***	0.000***	0.000***
	1	0.400	0.375	0.358	0.000***		
VC_AFTER	0	0.049	0.000	0.134	0.000***	0.000***	0.00***
	1	0.197	0.010	0.305	0.000***		
VC_SUPP	0	0.178	0.000	0.281	0.000***	0.001***	0.001***
	1	0.270	0.110	0.329	0.000***		

Variable	Group	Mean	Median	σ	Sign. (KS-Test)	Sign. (t-test)	Sign. (U-Test)
VC_R&D	0	0.063	0.000	0.192	0.000***	0.013**	0.022**
	1	0.115	0.000	0.259	0.000***		
VC_HR	0	0.057	0.000	0.160	0.000***	0.000***	0.000***
	1	0.140	0.000	0.284	0.000***		
VC_FIN	0	0.027	0.000	0.121	0.000***	0.005***	0.000***
	1	0.068	0.000	0.196	0.000***		
VC_MGMT	0	0.028	0.000	0.131	0.000***	0.133	0.033**
	1	0.050	0.000	0.188	0.000***		
VC_MEAN	0	0.069	0.019	0.123	0.000***	0.000***	0.000***
	1	0.194	0.153	0.176	0.000***		
VC_MEDIAN	0	0.034	0.000	0.120	0.000***	0.000***	0.000***
	1	0.126	0.000	0.236	0.000***		
AGE_MGMT	0	1.705	1.708	0.076	0.000***	0.064*	0.232
	1	1.690	1.708	0.091	0.000***		
EXP_MGMT	0	1.472	1.477	0.149	0.000***	0.045**	0.276
	1	1.439	1.477	0.203	0.000***		
GENERATION	0	1.747	1.000	1.040	0.000***	0.557	0.386
	1	1.806	1.000	1.031	0.000***		

Results

Logistic regression analyses

Table 6. Results from logistic regression analyses for non-exporters and exporters: Micro- & small firms

	Model I		Model II		Model III		Model IV		Model V		Model VI		Model VII		Model VIII	
Variable	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error
AGE	-0.297	0.327	1.406	1.635	-0.410	0.394	4.967**	2.266	0.012	0.395	1.730	1.732	-0.027	0.470	5.797**	2.343
AGE²			-0.619	0.585			-1.979**	0.822			-0.650	0.640			-2.223**	0.875
SIZE	-0.132	0.265	-0.122	0.265	-0.224	0.310	-0.171	0.316	-0.193	0.275	-0.206	0.276	-0.266	0.322	-0.269	0.329
LEG_FORM	0.748***	0.268	0.737***	0.268	0.319	0.320	0.270	0.323	0.722***	0.270	0.711***	0.271	0.232	0.327	0.163	0.331
VC_INBOUND					-0.984	0.700	-1.039	0.703					-0.833	0.702	-0.878	0.706
VC_PROD					0.631	0.613	0.611	0.620					0.640	0.621	0.603	0.628
VC_OUTBOUND					2.638**	1.199	2.719**	1.195					2.578**	1.201	2.731**	1.201
VC_MARKET					1.139*	0.687	1.277*	0.696					0.886	0.707	1.099	0.719
VC_SALES					3.432***	0.732	3.475***	0.738					3.558***	0.737	3.564***	0.741
VC_AFTER					0.783	0.930	0.854	0.945					0.927	0.936	1.086	0.963
VC_SUPP					0.594	0.538	0.550	0.541					0.747	0.543	0.696	0.548
VC_R&D					-0.667	0.742	-0.621	0.747					-0.801	0.757	-0.720	0.763
VC_HR					-1.266	0.836	-1.441*	0.855					-1.219	0.868	-1.466	0.894
VC_FIN					1.566	1.372	1.628	1.394					1.488	1.365	1.416	1.375
VC_MGMT					-3.947**	1.531	-3.989**	1.541					-3.817**	1.516	-3.876**	1.519
EXP_MGMT									-1.308**	0.639	-1.372**	0.644	-1.729**	0.796	-1.934**	0.816
GENDER									0.271	0.270	0.282	0.271	-0.063	0.309	-0.063	0.312
GENERATION									-0.154	0.140	-0.102	0.148	-0.195	0.165	-0.038	0.178
CONST.	-2.082*	1.119	-3.117**	1.483	-1.874	1.148	-5.156***	1.800	-0.419	1.429	-1.423	1.730	0.586	1.604	-2.811	2.102
Chi-Square	6.381		5.879		19.895		18.794		4.788		2.658		13.730		19.150	
Sign. Chi-Square	0.605		0.661		0.011**		0.016**		0.780		0.954		0.089*		0.014**	
R² (Nagelkerke)	0.213		0.216		0.471		0.482		0.227		0.230		0.482		0.494	
α-error (in %)	49.44		51.67		36.11		35.56		48.33		38.33		37.22		34.44	
β-error (in %)	16.73		16.73		7.83		7.47		16.37		16.73		8.90		8.54	
Accuracy (in %)	70.50		69.63		81.13		81.56		71.15		70.93		80.04		81.34	
AUC	0.733***	0.024	0.738***	0.024	0.862***	0.018	0.866***	0.018	0.745***	0.023	0.746***	0.023	0.865***	0.017	0.869***	0.017
Gini-coefficient	0.467		0.477		0.724		0.732		0.489		0.492		0.730		0.738	

Results

Logistic regression analyses

Table 7. Marginal effects analysis: Micro- & small firms

	Model I		Model II		Model III		Model IV		Model V		Model VI		Model VII		Model VIII	
Variable	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error
AGE	-0.059	0.065	0.280	0.324	-0.060	0.058	0.721**	0.324	0.002	0.078	0.339	0.338	-0.004	0.068	0.827**	0.328
AGE²			-0.123	0.116			-0.287**	0.117			-0.128	0.125			-0.317***	0.122
SIZE	-0.026	0.053	-0.024	0.053	-0.033	0.046	-0.025	0.046	-0.038	0.054	-0.040	0.054	-0.039	0.047	-0.038	0.047
LEG_FORM	0.149***	0.052	0.146***	0.052	0.047	0.047	0.039	0.047	0.142***	0.052	0.140***	0.052	0.034	0.047	0.023	0.047
VC_INBOUND					-0.145	0.102	-0.151	0.101					-0.121	0.101	-0.125	0.100
VC_PROD					0.093	0.090	0.089	0.090					0.093	0.090	0.086	0.089
VC_OUTBOUND					0.389**	0.174	0.395**	0.171					0.374**	0.172	0.390**	0.169
VC_MARKET					0.168*	0.100	0.185*	0.100					0.129	0.102	0.157	0.102
VC_SALES					0.506***	0.099	0.504***	0.098					0.516***	0.098	0.509***	0.097
VC_AFTER					0.115	0.137	0.124	0.137					0.134	0.135	0.155	0.137
VC_SUPP					0.088	0.079	0.080	0.078					0.108	0.078	0.099	0.078
VC_R&D					-0.098	0.109	-0.090	0.108					-0.116	0.109	-0.103	0.109
VC_HR					-0.186	0.122	-0.209*	0.123					-0.177	0.125	-0.209*	0.126
VC_FIN					0.231	0.201	0.236	0.201					0.216	0.197	0.202	0.195
VC_MGMT					-0.581***	0.220	-0.579***	0.218					-0.554**	0.215	-0.553***	0.212
EXP_MGMT									-0.257**	0.124	-0.269**	0.124	-0.251**	0.114	-0.276**	0.114
GENDER									0.053	0.053	0.055	0.053	-0.009	0.045	-0.009	0.045
GENERATION									-0.030	0.027	-0.020	0.029	-0.028	0.024	-0.005	0.025

Results

Logistic regression analyses

Table 8. Results from logistic regression analyses for non-exporters and exporters: Micro firms

	Model I		Model II		Model III		Model IV		Model V		Model VI		Model VII		Model VIII	
Variable	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error
AGE	-0.159	0.434	0.884	2.267	-0.051	0.518	2.262	2.884	0.062	0.509	1.580	2.465	0.513	0.629	2.839	3.133
AGE²			-0.403	0.861			-0.870	1.073			-0.609	0.968			-0.910	1.204
SIZE	-0.817*	0.449	-0.822*	0.450	-0.895*	0.536	-0.882	0.539	-0.947**	0.458	-0.967**	0.461	-1.057*	0.561	-1.069*	0.564
LEG_FORM	0.965***	0.362	0.964***	0.362	0.309	0.463	0.297	0.462	0.992***	0.367	0.991***	0.368	0.203	0.478	0.191	0.478
VC_INBOUND					-1.089	0.926	-1.073	0.924					-0.908	0.910	-0.890	0.912
VC_PROD					0.555	0.763	0.563	0.763					0.522	0.773	0.515	0.775
VC_OUTBOUND					2.529	1.605	2.521	1.601					2.199	1.579	2.226	1.576
VC_MARKET					1.112	0.940	1.196	0.946					0.928	0.946	1.007	0.949
VC_SALES					3.455***	0.994	3.461***	0.997					3.726***	1.011	3.697***	1.011
VC_AFTER					0.474	1.363	0.456	1.373					0.665	1.367	0.673	1.386
VC_SUPP					0.284	0.662	0.255	0.664					0.524	0.674	0.514	0.677
VC_R&D					-0.549	0.843	-0.552	0.844					-0.670	0.864	-0.657	0.865
VC_HR					1.746	1.618	1.669	1.622					1.978	1.680	1.936	1.700
VC_FIN					2.217	1.964	2.244	2.013					1.811	1.874	1.708	1.907
VC_MGMT					-6.788***	2.480	-6.816***	2.527					-6.558***	2.414	-6.550***	2.451
EXP_MGMT									-1.555*	0.857	-1.578*	0.860	-2.370**	1.144	-2.451**	1.155
GENDER									0.370	0.324	0.384	0.325	0.047	0.375	0.070	0.376
GENERATION									-0.069	0.182	-0.014	0.201	-0.247	0.221	-0.166	0.247
CONST.	-2.859**	1.183	-3.463**	1.752	-3.477**	1.354	-4.836**	2.148	-0.911	1.671	-1.825	2.212	-0.343	2.021	-1.695	2.697
Chi-Square	5.806		5.896		6.842		5.400		5.852		4.783		7.090		6.741	
Sign. Chi-Square	0.669		0.659		0.554		0.714		0.664		0.780		0.527		0.565	
R² (Nagelkerke)	0.252		0.252		0.491		0.492		0.266		0.268		0.504		0.505	
α-error (in %)	54.39		56.14		42.98		43.86		52.63		53.51		42.11		42.11	
β-error (in %)	13.21		13.21		7.08		7.08		13.68		12.74		7.08		7.08	
Accuracy (in %)	72.39		71.78		80.37		80.06		72.70		73.01		80.67		80.67	
AUC	0.758***	0.028	0.759***	0.028	0.863***	0.022	0.865***	0.022	0.763***	0.028	0.764***	0.028	0.867***	0.021	0.868***	0.021
Gini-coefficient	0.460		0.464		0.787		0.816		0.488		0.490		0.780		0.814	

Results

Logistic regression analyses

Table 9. Marginal effects analysis: Micro firms

	Model I		Model II		Model III		Model IV		Model V		Model VI		Model VII		Model VIII	
Variable	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error
AGE	-0.029	0.080	0.163	0.417	-0.007	0.071	0.308	0.391	0.011	0.092	0.286	0.445	0.069	0.084	0.380	0.418
AGE²			-0.074	0.158			-0.118	0.146			-0.110	0.175			-0.122	0.161
SIZE	-0.150*	0.081	-0.151*	0.081	-0.122*	0.072	-0.120*	0.072	-0.172**	0.081	-0.175**	0.082	-0.142*	0.074	-0.143*	0.074
LEG_FORM	0.178***	0.064	0.177***	0.064	0.042	0.063	0.040	0.063	0.180***	0.064	0.179***	0.064	0.027	0.064	0.026	0.064
VC_INBOUND					-0.149	0.125	-0.146	0.125					-0.122	0.121	-0.119	0.121
VC_PROD					0.076	0.104	0.077	0.104					0.070	0.104	0.069	0.103
VC_OUTBOUND					0.345	0.216	0.343	0.215					0.295	0.210	0.298	0.209
VC_MARKET					0.152	0.127	0.163	0.128					0.124	0.126	0.135	0.126
VC_SALES					0.472***	0.128	0.471***	0.128					0.500***	0.127	0.495***	0.127
VC_AFTER					0.065	0.186	0.062	0.187					0.089	0.183	0.090	0.185
VC_SUPP					0.039	0.090	0.035	0.090					0.070	0.090	0.069	0.090
VC_R&D					-0.075	0.115	-0.075	0.115					-0.090	0.116	-0.088	0.115
VC_HR					0.238	0.220	0.227	0.220					0.265	0.224	0.259	0.226
VC_FIN					0.303	0.266	0.305	0.272					0.243	0.250	0.229	0.254
VC_MGMT					-0.926***	0.327	-0.928***	0.332					-0.880***	0.313	-0.877***	0.317
EXP_MGMT									-0.282*	0.153	-0.286*	0.153	-0.318**	0.151	-0.328**	0.152
GENDER									0.067	0.058	0.070	0.058	0.006	0.050	0.009	0.050
GENERATION									-0.013	0.033	-0.003	0.036	-0.033	0.029	-0.022	0.033

Results

Logistic regression analyses

Table 10. Results from logistic regression analyses for non-exporters and exporters: Small firms

	Model I		Model II		Model III		Model IV		Model V		Model VI		Model VII		Model VIII	
Variable	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error	Coeff.	Std.-error
AGE	-0.672	0.548	1.814	2.889	-1.395*	0.812	10.689**	5.421	-0.232	0.690	1.943	2.929	-1.444	0.955	11.624**	5.325
AGE²			-0.824	0.955			-4.255**	1.849			-0.740	0.979			-4.715**	1.854
SIZE	-1.534	1.111	-1.562	1.111	-1.540	1.438	-1.297	1.471	-1.518	1.120	-1.560	1.123	-1.698	1.480	-1.541	1.532
LEG_FORM	0.440	0.422	0.423	0.423	-0.188	0.566	-0.277	0.597	0.369	0.430	0.347	0.431	-0.189	0.586	-0.263	0.626
VC_INBOUND					-1.167	1.548	-1.330	1.607					-1.131	1.587	-1.346	1.655
VC_PROD					1.973	1.440	1.784	1.505					1.952	1.466	1.661	1.546
VC_OUTBOUND					2.023	2.128	3.135	2.290					2.046	2.135	3.501	2.336
VC_MARKET					0.225	1.184	0.424	1.278					0.231	1.267	0.787	1.404
VC_SALES					5.692***	1.552	5.954***	1.638					5.769***	1.554	6.080***	1.642
VC_AFTER					2.121	1.683	2.500	1.737					2.063	1.696	2.415	1.713
VC_SUPP					1.733	1.390	1.619	1.385					1.792	1.458	1.683	1.458
VC_R&D					0.433	2.461	1.509	2.492					0.294	2.521	1.542	2.587
VC_HR					-3.946***	1.443	-4.517***	1.545					-3.890**	1.522	-4.759***	1.677
VC_FIN					-0.617	2.603	-1.503	2.527					-0.339	2.767	-1.079	2.645
VC_MGMT					-4.223*	2.404	-4.759*	2.503					-4.319*	2.423	-5.102**	2.532
EXP_MGMT									-0.809	1.042	-0.913	1.055	-0.601	1.429	-0.877	1.483
GENDER									0.347	0.525	0.341	0.527	-0.233	0.726	-0.498	0.760
GENERATION									-0.239	0.237	-0.204	0.242	0.011	0.310	0.204	0.332
CONST.	1.266	1.928	-0.497	2.778	-0.677	2.917	-9.484*	5.164	2.017	2.494	0.611	3.081	0.440	3.687	-8.616	5.568
Chi-Square	6.295		9.269		4.960		5.225		6.303		5.446		4.511		7.855	
Sign. Chi-Square	0.614		0.320		0.762		0.733		0.613		0.709		0.808		0.448	
R² (Nagelkerke)	0.205		0.212		0.569		0.601		0.222		0.227		0.570		0.608	
α-error (in %)	30.30		28.79		21.21		18.18		34.85		31.82		21.21		19.70	
β-error (in %)	31.88		30.43		15.94		14.49		30.43		30.43		17.39		13.04	
Accuracy (in %)	68.89		70.37		81.48		83.70		67.41		68.89		80.74		83.70	
AUC	0.730***	0.044	0.732***	0.043	0.893***	0.028	0.908***	0.026	0.744***	0.042	0.745***	0.042	0.890***	0.028	0.907***	0.026
Gini-coefficient	0.460		0.464		0.787		0.816		0.488		0.490		0.780		0.814	

Results

Logistic regression analyses

Table 11. Marginal effects analysis: Small firms

	Model I		Model II		Model III		Model IV		Model V		Model VI		Model VII		Model VIII	
Variable	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error	dy/dx	Std.-error
AGE	-0.142	0.113	0.379	0.601	-0.188*	0.105	1.367**	0.659	-0.048	0.143	0.401	0.601	-0.194	0.125	1.461**	0.626
AGE²			-0.172	0.198			-0.544**	0.220			-0.153	0.200			-0.593***	0.212
SIZE	-0.323	0.228	-0.327	0.226	-0.208	0.191	-0.166	0.186	-0.315	0.226	-0.322	0.226	-0.228	0.195	-0.194	0.190
LEG_FORM	0.093	0.088	0.089	0.087	-0.025	0.076	-0.035	0.076	0.076	0.088	0.072	0.088	-0.025	0.079	-0.033	0.078
VC_INBOUND					-0.157	0.207	-0.170	0.204					-0.152	0.212	-0.169	0.206
VC_PROD					0.266	0.189	0.228	0.188					0.262	0.192	0.209	0.191
VC_OUTBOUND					0.273	0.283	0.401	0.287					0.275	0.283	0.440	0.286
VC_MARKET					0.030	0.159	0.054	0.163					0.031	0.170	0.099	0.176
VC_SALES					0.767***	0.168	0.762***	0.168					0.775***	0.166	0.764***	0.163
VC_AFTER					0.286	0.222	0.320	0.216					0.277	0.224	0.304	0.209
VC_SUPP					0.234	0.184	0.207	0.174					0.241	0.193	0.212	0.180
VC_R&D					0.058	0.332	0.193	0.317					0.040	0.339	0.194	0.323
VC_HR					-0.532***	0.175	-0.578***	0.174					-0.523***	0.186	-0.598***	0.186
VC_FIN					-0.083	0.351	-0.192	0.322					-0.046	0.372	-0.136	0.332
VC_MGMT					-0.569*	0.310	-0.609**	0.304					-0.580*	0.311	-0.641**	0.299
EXP_MGMT									-0.168	0.214	-0.188	0.216	-0.081	0.192	-0.110	0.185
GENDER									0.072	0.108	0.070	0.108	-0.031	0.097	-0.063	0.095
GENERATION									-0.049	0.048	-0.042	0.049	0.002	0.042	0.026	0.042

Summary and discussion of the results

- The results show that family businesses that are export-oriented differ statistically significantly from non-export-oriented family businesses in **certain activities** (outbound logistics, sales, management)

- Nevertheless, it is noteworthy that the majority of the latter show a **certain degree of internationalisation** in many activities of the value chain, which is a new result not found in previous literature

- When testing the **robustness** of the results, it can be seen that the **outbound logistic** is **not significantly** different for both types of business, but that the **human resource** activity becomes significant for **small firms**

- The results of the study show that the existing definitions of internationalisation in the literature are **not sufficient** to capture the "true" degree of internationalisation of a company / non-export-oriented companies can very well be involved in international relations through activities in the value chain, so that a classic separation between export-oriented and non-export-oriented is too narrow and therefore a broader view in the research field is necessary.

- The results are particularly suitable for developing a **complementary** or **alternative model** of **stage theory**

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Contact details

Prof. (FH) DDr. Mario Situm, MBA
Director of Studies & Professor
Bachelor Management
Master Corporate Transformation Management
University of Applied Sciences Kufstein
Andreas Hofer-Straße 7 | 6330 Kufstein
Mail: mario.situm@fh-kufstein.ac.at
Tel +43 (0)5372 - 71 819 – 147
Web: www.dr-situm.com

Mario Situm is programme director and professor at the Institute for Corporate Restructuring at the University of Applied Sciences, where he is active in research and teaching. Research topics focus on the early detection of corporate crises, risk management and family businesses. In addition to his work in the financial services and real estate business, he worked for several years at the Bank für Tirol und Vorarlberg AG, Innsbruck, where his last function was as an account manager for key accounts and special financing, following a management position. Actually, he additionally works as an independent consultant and advises small and medium-sized enterprises on the implementation of a wide range of topics.

He studied business administration at the Leopold Franzens University in Innsbruck and received his doctorate there. He also completed studies in financial services at Danube University Krems and in financial management at Johannes Kepler University in Linz. He completed his doctorate in finance at the Swiss Management Center. In the area of publications, his focus is on controlling, family businesses, finance, crisis and insolvency forecasting, and payment & cash management. He is an editorial board member and reviewer of the Business Strategy Review, the American International Journal of Business and Management Studies, the International Journal of Finance and Banking Research and several other international journals.